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MEDICAL ELECTRONIC SYSTEMS IN ONCOLOGY: A REVIEW OF THE LITERATURE

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Medical electronic systems in oncology: a review of the literature

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1. Introduction

Mirroring other industries which aim to make productivity and service gains from new technologies, health care providers are increasingly resorting to electronic systems [e-health, web-based or computerised systems: collectively, information and communication technology (ICT)], by which to manage patients' care (Eccher et al. 2009, Murphy 2009). Despite keenness from early proponents and the growing penetration of ICT systems, acceptance of them has been patchy (Berner et al. 2005, Gagnon et al. 2010). Widespread use has been hampered by a lack of research about the mechanisms of adoption. Better translational research – learning how to get ICT into practice efficiently and effectively, and realising their benefits in order to improve health outcomes – is badly needed (Ousley et al. 2010, Woolf 2008).

Implementation science, an emerging field which strives to contribute to an understanding of how to enhance translation and adoption, predicts that take-up even of systems that show distinct benefits will be challenging because of various social, professional, industrial and economic barriers, constraints and resistance mechanisms (Braithwaite et al. 2008, Greenhalgh et al. 2010, Jha et al. 2008, Murray et al. 2011, Westbrook and Braithwaite 2010). In securing gains an understanding of evidence about the relevant ICT system's strengths and weaknesses, information about obstacles and enablers, an appraisal of the factors promoting uptake, an understanding of change theories relevant to the use of these systems, and strategies for greater levels of their use are needed (Braithwaite and Mannion in press, DesRoches et al. 2008, Hendy et al. 2005, Øvretveit et al. 2007).

The use of ICT systems in cancer care is no exception, and is a case worthy of specific research attention. There are some 7.6 million cancer deaths worldwide, with 30% thought to be preventable (World Health Organisation 2011). This is forecast to rise to 11 million deaths by 2030. Australia has the third highest cancer rate in the world, at 314.1 per 100,000 people (Ferlay et al. 2010). Over the past ten years oncology practice has changed substantially to include a dramatic shift from the in-patient to the ambulatory environment needing care across primary and acute settings; multidisciplinary teams and multimodal treatments requiring data sharing across providers; and increased treatment across public and private settings. These shifts point to a requirement for ICT, including oncology information and decision support systems, to facilitate clinical practice.

ICT systems with the goal of guiding treatment decisions, reducing medical errors and improving patient outcomes, as well as facilitating the management of patients more quickly and effectively, are becoming available and are increasingly in use (Eccher et al. 2009, Greenberg et al. 2006, Murphy 2009,

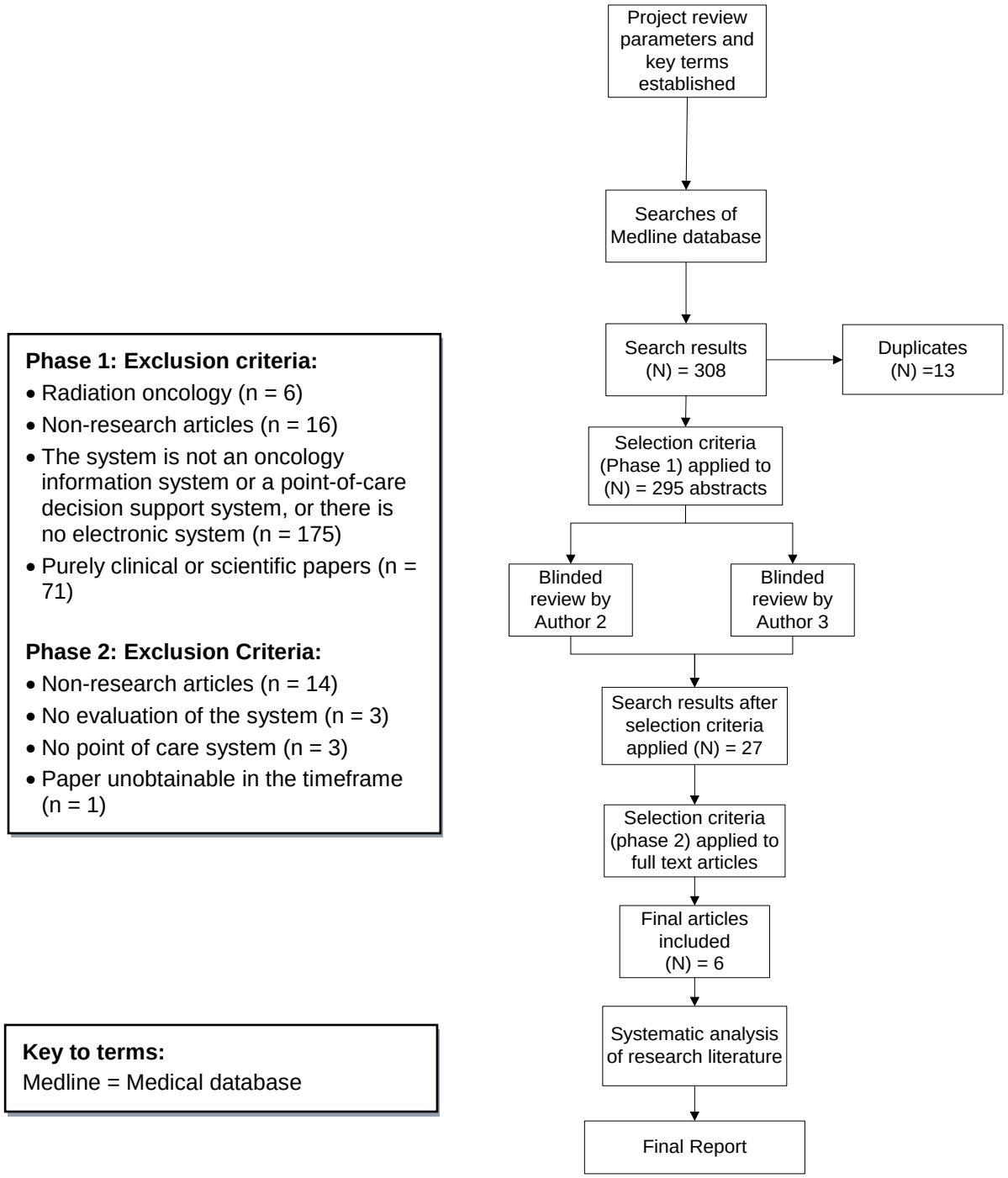
Siochi et al. 2009, Voeffray et al. 2006). However we have poor knowledge about their uptake and even less evidence about the benefits they actually achieve as compared to what proponents and vendors of such systems promise they can achieve. ICT can even create new problems or errors (Ash et al. 2004, Koppel et al. 2005). Thus our objective in this review was to examine the literature on ICT systems in non-radiation oncology cancer care, particularly medical oncology, focussing on the evidence associated with the evaluation of such systems in supporting clinical practice. One key interest was to examine work which had an evaluative component, i.e. to examine how others had gone about evaluating ICT systems in cancer care.

In what follows we specify the literature review process employed. Next, we document our search strategies and then present our findings. We discuss our findings, and then conclude the monograph.

2. The literature review process

The literature review process engaged a rigorous, systematic search strategy followed by content analysis of those references that met specified inclusion criteria. This review strategy, planned and documented in the first half of 2011 with the searches conducted in June and July 2011, emulates a process used in other reviews (Greenfield et al. 2007, Travaglia and Braithwaite 2007) and described by Travaglia et al (Travaglia et al. 2008). The literature review process is diagrammed in Figure 1.

Figure 1: The literature review process



3. Search strategy

A multi-phased search strategy was employed. The Medline database was systematically examined. An initial search of the literature between 1948 and July 2011, using the search terms “oncology” or “medical oncology”, yielded 45,772 results.

To narrow the literature, key search terms were synthesised from the brainstorming process, defined *a priori* through a series of collaborative discussions between the authors. They are specified in Table 1.

Table 1: Search terms used in the academic database search

Search terms
“medical oncology” OR “oncology” AND
“medical informatics”
OR “information systems”
OR “medical record systems, computerized”
OR “electronic health records”
OR “cancer care”
OR “spread”
OR “sustainability”
OR “uptake”
OR “tools”
OR “web-based systems”
OR “internet”
OR “clinical decision support systems”
OR “oncology management information system”

This focused Medline search yielded 1,141 citations. These results were candidates for further refinement. The search was limited to the English language from 2008 – current, in order to review the most recent literature.

Table 2: Exclusion criteria applied in Phase 1

Selection criteria
Radiation oncology
Non-research articles

No evaluation of the system
The system is not an oncology information system or a point-of-care decision support system, or there is no electronic system
Purely clinical or scientific papers

This resulted in 308 citations. These articles were downloaded into a reference manager software program, Endnote X4. Duplicates were removed, resulting in a total of 295 articles. The concepts and themes of the 295 abstracts were extracted using Leximancer software. Two reviewers (IH and DM) analysed the titles and abstracts of the 295 articles and applied the exclusion criteria in Table 2.

The findings of the reviewers were blinded from each other until the completion of this step. Disagreements on the inclusion of articles were resolved through discussion and further analysis of the abstract. Twenty-seven references were considered to be potentially relevant and the full text of these articles was obtained, with the exception of one paper where the full text could not be obtained in a timely manner. Using the exclusion criteria detailed in Table 3, the 26 articles were further refined to six research articles. Each reviewer summarised and extracted the data from three papers, checked by the other reviewer for accuracy and completeness.

Table 3: Exclusion criteria applied in Phase 2

Selection criteria
Non-research articles
No real-time evaluation of the system
The system is not an oncology information system or a point-of-care decision support system, or there is no electronic system

4. Analysis and Findings

4.1. Content analysis, part one: data mining of texts

The 295 eligible abstracts were subjected to content analysis using the software program Leximancer 3.0. The derived six references were reserved for later

analysis. Leximancer is a data mining program which identifies concepts within bodies of text, the frequency with which they occur, the relationships between them and the strength of those relationships. These data are presented in two ways: as a visual map where distance between concepts (represented as dots) is indicative of the strength of their association in the text; and as ranked lists of concepts and themes (groupings of concepts).

A map of the key concepts within the derived literature is presented in Figure 2. The list of themes is presented in Table 4 and the ranked list of concepts in Table 5.

Figure 2: Map of the key themes in the literature

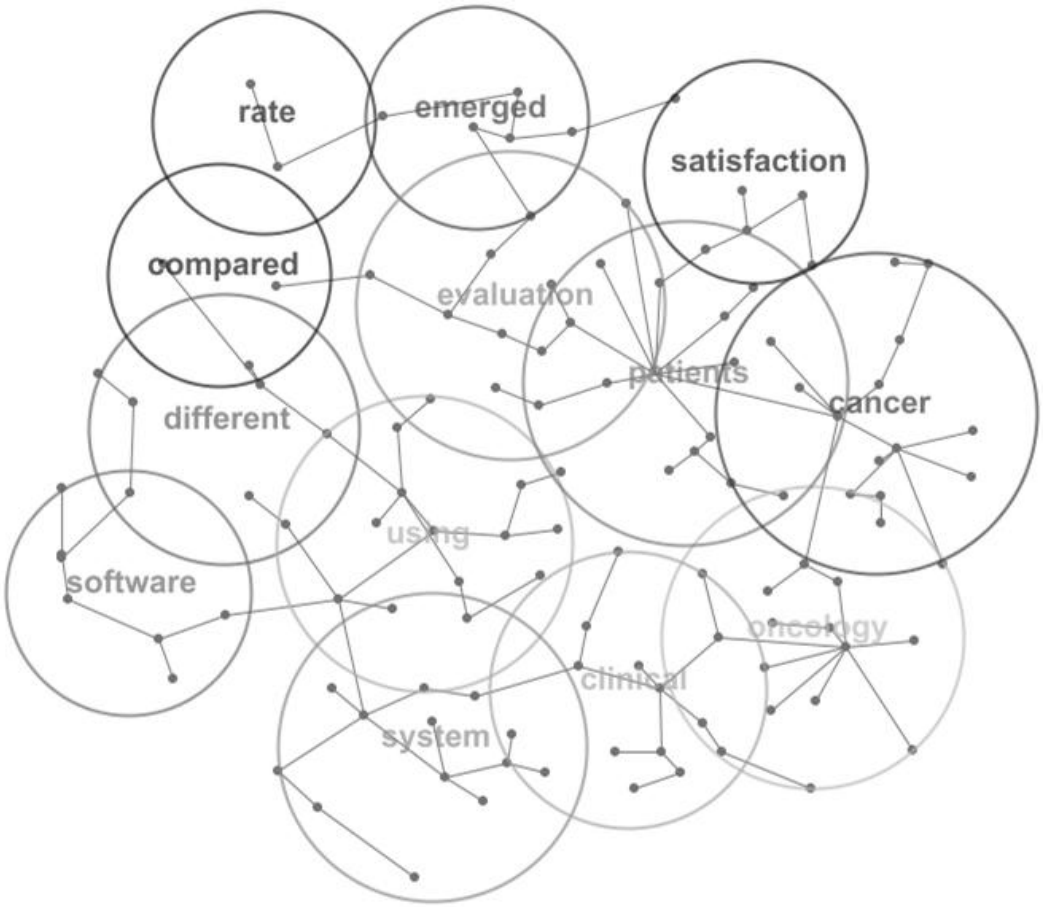


Table 4: Ranked list of key themes and connectivity in the literature

Theme	Connectivity
cancer	100%
patients	93%
using	83%

oncology	69%
clinical	66%
evaluation	56%
system	55%
different	23%
software	22%
emerged	18%
satisfaction	06%
rate	03%

Table 5: Ranked list of key concepts and connectivity in the literature

Concept	Count	Relevance		Concept	Count	Relevance
patients	505	100%		experience	65	13%
cancer	411	81%		knowledge	65	13%
using	366	72%		skills	64	13%
oncology	291	58%		based	64	13%
care	265	52%		during	62	12%
clinical	216	43%		cases	60	12%
study	200	40%		electronic	60	12%
treatment	192	38%		therapy	59	12%
developed	185	37%		maximize	59	12%
system	181	36%		database	58	11%
information	177	35%		applications	57	11%
provide	175	35%		trials	56	11%
data	158	31%		approach	56	11%
improve	153	30%		appear	56	11%
evaluation	151	30%		control	55	11%
program	138	27%		important	55	11%
practice	136	27%		physicians	54	11%
assessment	127	25%		survivors	54	11%
medical	118	23%		initial	53	10%
effects	116	23%		services	53	10%
emerged	116	23%		chemotherapy	50	10%
quality	115	23%		satisfaction	49	10%
support	115	23%		available	49	10%
reported	113	22%		pain	47	09%
time	113	22%		oncologists	47	09%
research	111	22%		compared	47	09%

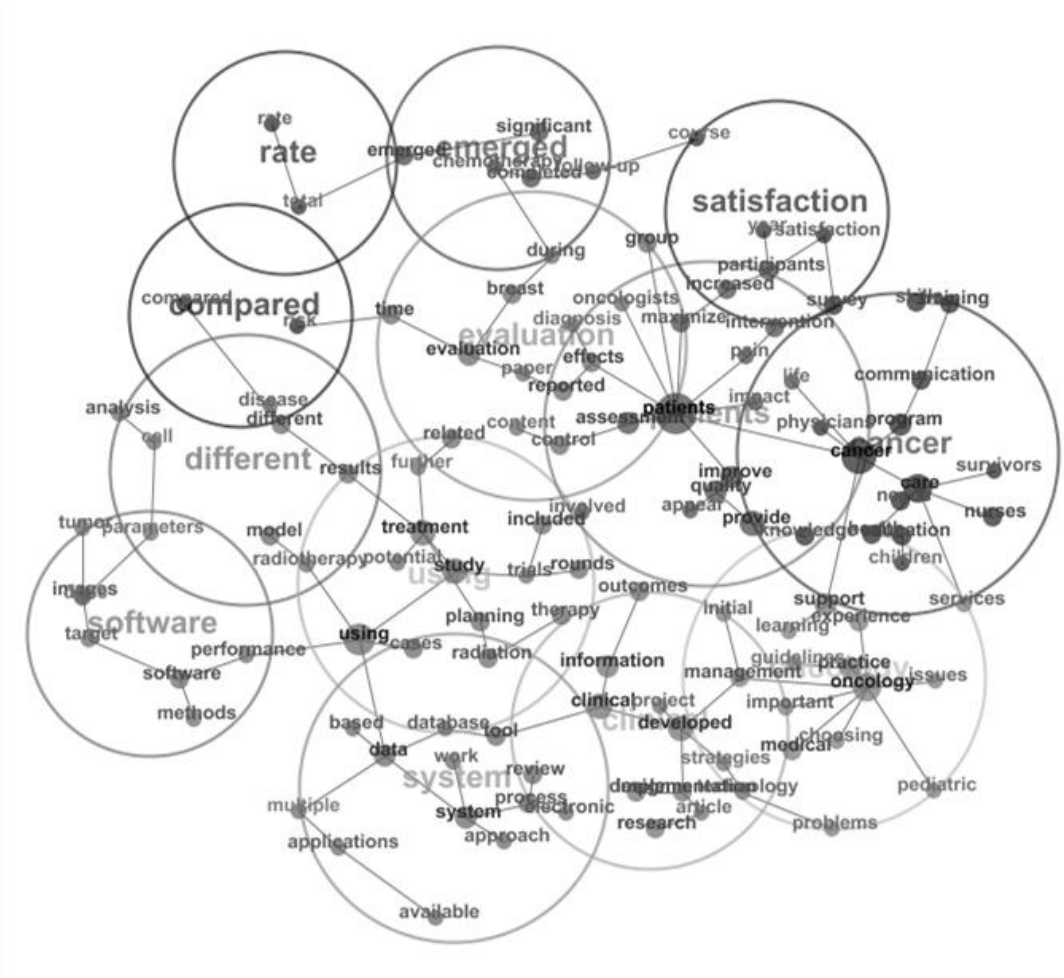
nurses	109	22%		disease	47	09%
training	109	22%		issues	46	09%
included	108	21%		technology	45	09%
implementation	108	21%		target	45	09%
tool	103	20%		radiotherapy	44	09%
group	99	20%		rate	44	09%
rounds	98	19%		learning	43	09%
education	96	19%		risk	43	09%
planning	91	18%		project	42	08%
different	91	18%		potential	42	08%
significant	89	18%		tumor	42	08%
results	88	17%		involved	41	08%
model	87	17%		follow-up	41	08%
communication	85	17%		impact	40	08%
increased	83	16%		choosing	40	08%
management	82	16%		work	39	08%
participants	82	16%		article	38	08%
images	82	16%		paper	38	08%
software	81	16%		problems	38	08%
health	77	15%		dose	37	07%
breast	76	15%		content	35	07%
radiation	75	15%		diagnosis	34	07%
design	73	14%		year	34	07%
analysis	73	14%		life	33	07%
survey	71	14%		guidelines	33	07%
performance	71	14%		strategies	33	07%
outcomes	70	14%		children	33	07%
needs	70	14%		parameters	33	07%
process	70	14%		pediatric	33	07%
intervention	68	13%		course	32	06%
completed	67	13%		total	29	06%
methods	67	13%		further	28	06%
review	66	13%		cell	26	05%
related	66	13%		multiple	24	05%

The key themes (Figure 2 and Table 4) and concepts list (Table 5) confirm the search terms deployed and reflect the aim of the literature review. Major themes centre on **using**, and the **evaluation** of, **different software** and **information**

systems to **improve** the **quality** of **medical** and **nursing care** and **treatment** for **patients** in **cancer** and **oncology.**

Figure 3 provides a map generated by Leximancer populated with all concepts. It provides a more detailed representation of the relationship between those concepts. Central to the map are the concepts **cancer** and **oncology patients**; **using treatments**, **planning**, **trials**, **ward rounds**, **therapy** and **radiation** to **provide care**; and **accessing**, **evaluating** and **comparing software** and related **systems** to **deliver services**.

Figure 3: Map of the key concepts in the literature



4.2. Content analysis, part two: researchers' assessment of the six derived articles

Analysis of the literature identified in part 1 revealed the broad scope of the literature. A process was implemented to assess further the derived articles.

The six articles remaining after applying the inclusion and exclusion criteria were examined in detail by the two blinded researchers. Table 6 provides a summary of them. It shows that included studies reflected work undertaken in the United States of America (three studies), Australia (two studies) and Canada (one study). Research was executed via social science methods with four articles utilising triangulated, mixed methods approaches and two conducting semi-structured interviews of staff.

Table 6: Summary of the six derived articles

Study Author and Year	Methods	Participants	Setting	Aim	Type of ICT	Findings
Boudreaux et al 2010	**Study design**: Prospective qualitative and quantitative pilot study. **Method**: Process log, semi-structured interviews, questionnaire.	101 cancer patients. 90 Oncology providers.	**Country:** USA. **Clinical setting:** 1 urban cancer care centre. 1 suburban cancer care centre. **Year Conducted:** not reported.	To evaluate the Mental Health Assessment and Dynamic Referral for Oncology 's (MHADRO) functionality, feasibility and end-user satisfaction.	Web-based program with three integrated modules: 1. A computerised assessment; 2. A report generator; 3. A referral generator.	1. Barriers to implementation: i) delay in provider reviewing the healthcare provider report; ii) Lack of understanding by patient of meaning of MHADRO items; iii) Technical issues. 2. Patient satisfaction ratings: i) length of assessment "just right = 88%; ii) preference for answering questions on computer vs paper = 74%; iii) Suitable for use with cancer patients = 100%; iv) Mean satisfaction scores for the following items between "good" and "excellent": Instructions; Ability to read; Ease of moving through assessment; Ability to understand items; Organisation of report; Understand report; Usefulness of information,; Accuracy

						of report; Length of report; Referral information; Support group information. 3. Oncology provider satisfaction: i) Mean satisfaction scores for the following items between "good" and "excellent": Understandability of report; Usefulness of report; Length of report; appropriate referral given; ii) healthcare provider report contained information not previously assessed in their medical evaluation = 48%; iii) new information from the report changed the way the provider managed the patient = 24%; iv) providers stated that 49% of a group of patients received referral information they would not have done under routine clinical care.
Carpenter et al 2008	**Study design**: Descriptive, longitudinal study with retrospective longitudinal medical records review **Method**: observation, interviews, questionnaire, focus groups, chart audit	80 oncology outpatients 8 providers: oncologists (n=4), oncology nurses (n=4) 30 medical records (randomly selected)	**Country:** USA **Clinical setting:** Outpatient cancer centre **Year Conducted:** not reported	To assess patient and provider responses to a computerised symptom assessment system which patients used for 3 chemotherapy follow-up appointments.	Computerised symptom assessment system on touch screen tablets for patients to complete. Once completed printout were given to the patient and attached to the patient's chart for review by the provider.	1. Patient usability: requests for help from research staff or family and friends and technical issues decreased over time; 2. Patient satisfaction: i) At times 1 and 3 >80% reported the computer included understandable and appropriate questions, was likeable and easy to use, the printouts were likeable and accurate, the project was worthwhile and they would recommend the system; ii) Average of 50% agreed that the computer or printout made it easier to talk to the doctor or that the doctor used the

						printout. iii) 30-44% (times 1 and 2) believed they spent more time discussing symptoms with the doctor. 3. Patient impact: >64% patients who had a symptom discussed it with their provider over time. 4. Provider usability: i) System did not add to length of clinic visits = 62.5%; ii) System did not disrupt clinic flow = 62.5%; iii) System resulted in same number of questions about symptoms from patients = 100%; iv) System was positively received by patients = 100%. v) Further positives of system are that patients felt more cared for and doctor was more aware of symptoms and it helped soothe nerves of patients waiting for the doctor; vi) Further negatives were printout problems, replication of work, system did not substitute for history or physical and it was not clear of the system identified patients who would not have previously reported systems. 5. Provider impact: i) System enhanced management for pain = 37.5%, fatigue = 50%, depression = 62.5%, anxiety = 75% and sleep issues = 50%; ii) Majority of medical records had no documentation by oncologists or oncology nurses pre- and post of symptoms; iii) Further positives of

						system are that it made providers more aware of symptoms, it "primes" the patient for provider assessments, helps provider to focus on problems and keep to time; iv) Further negatives were that providers were already using other symptoms, particularly paper and were more comfortable using these.
Hains et al 2009	**Study design**: Prospective qualitative study **Method**: Observation and semi-structured interviews	1. Interviews: 16 physicians: attending n=11, residents n=5; 30 nurses: NUM n=5, CNC n=5, CNS n=5, RN n=15 4 oncology pharmacists 2. Observation: 10 physicians; All nurses	**Country:** Australia **Clinical setting:** 6 public hospital medical oncology outpatient centres: 2 metropolitan, 2 regional, 2 rural **Year Conducted:** 2007-2008	To determine the factors affecting the uptake and use of a web-based protocol system for medical oncology in the Australian setting.	CI-SCaT (now eviQ) – web-based program of evidence based treatment protocols and patient information to support the way care is implemented after treatment decisions are made.	Key issues that impact on clinicians' attitudes toward and use of CI-SCaT: 1. CI-SCaT is well-known and highly regarded by the majority of clinicians; 2. CI-SCaT supports all aspects of the chemotherapy treatment process; 3. CI-SCaT use is determined by multiple factors: i) Clinician specific factors e.g. experience in medical oncology, perceived benefits, autonomy, time and IT skills; ii)environmental factors e.g. hospital policy, hospital culture and the availability of IT infrastructure 4. Clinician education is key to the use of CI-SCaT.
Paré et al 2009	**Study design**: Pre and post evaluation study **Method**: Semi-structured interviews, self-administered questionnaire surveys,	1. Interviews: 18 interviews conducted with a sample of nurses using the telehomecare intervention; and key project stakeholders	**Country:** Canada **Clinical setting:** Oncology and palliative care unit.	To assess the effects of SyMO, a telehomecare intervention implemented in an oncology and palliative care unit.	SyMO software – software that records patients' clinical data during home visits and immediately sends the data to other healthcare providers	1. Perceived quality of care: i) SyMO allowed the nurses to improve the completeness and quality of their interventions during home visits, particularly with regard to patient assessments, treatment and education.

	document analysis.	(project manager, champion, analyst and information resource manager). Questionnaire surveys: 7 nurses (first post-deployment period) 6 nurses (second post-deployment period).	**Year Conducted:** 2006-2008		involved. Nurses used SyMO on a tablet PC with a stylus.	ii) Nurses found the quality of information stored in the system to be valuable when recalling patient information during a visit. 2. Effects on productivity: i) The number of patients all the nurses treated significantly increased (p=0.04). ii) The average number of home visits made by a nurse per shift significantly increased (p=0.02). iii) The percentage of time nurses spent providing direct care to patients significantly increased (p=0.003). iv) The time spent on documentation significantly decreased (p=0.02).
Whittaker et al 2009	**Study design**: Descriptive qualitative study. **Method**: Semi-structured interviews.	Interviews: 11 registered nurses	**Country:** USA **Clinical setting:** Oncology and medical-surgical units in a rural Midwestern hospital. **Year Conducted:** 2008	To explore nurses' perceptions of barriers and facilitators to adopting an electronic health record (EHR).	An EHR – a computerised documentation system containing electronic patient demographics, order entry, notes, access to test results and clinical decision support functions.	Three types of facilitators and barriers to the adoption of the EHR emerged: 1a. Computer-related facilitators: Laptops can be taken to patient's bedside, ease of use, reduces written documentation. 1b. Computer-related barriers: Laptops are slow, logging on/off is time consuming, misplaced laptops, laptop batteries dead/missing power cords, difficulty finding other disciplines' information, prefer to use a mouse. 2a. Nurse-related facilitators: good time management skills and point-of-care documentation, team player, adaptable, prior computer experience, openness to change, positive outlook.

						2b. Nurse-related barriers: Poor time management skills and charting done at end of shift, difficulty seeking help, lack of computer experience, negative outlook. 3a. Contextual facilitators: Staff support each other, availability of super trainers, supportive manager. 3b. Contextual barriers: Timing of training, information overload, changes in system information, inability to obtain support from other staff, dealing with physician computer-related problems.
Yu et al 2010	**Study design**: Descriptive qualitative study. **Method**: Semi-structured interviews.	12 radiation oncologists: Hospital A n=6, Hospital B n=6.	**Country:** Australia **Clinical setting:** Department of Radiation Oncology at two public hospitals **Year Conducted:** 2007	To compare the implementation and use of the same Oncology Information System (OIS) in two public hospitals and account for any differences in the use of the system.	LANTIS®, Siemens Oncology Care Systems – an Oncology Information System. Study interested in the electronic medical record function only.	1. Reasons for the introduction of the OIS i) Clinician leaders at Hospital A wanted the hospital to be paperless as they believed it would increase efficiency. ii) Hospital B introduced the OIS to solve an existing booking system problem. There was no vision to become paperless. 2. Usage of the OIS i) Hospital A: Clinician use of the OIS was compulsory; the OIS was used for administrative purposes, prescribing chemotherapy and clinical notes. It was the only documentation system for radiation oncologists, therapists, physicists and nurses, and was used extensively in medical oncology, haematology and palliative care. The implementation of the OIS was regarded as an ongoing process.

						ii) Hospital B used the administrative functions of the OIS. Diagnosis was the only clinical data entered. This was done by trained staff after clinicians' refusal to do so. 3. Reasons for the different use of the OIS: i) Staff demographics ii) Leadership iii) The project manager's contribution iv) Clinicians' attitudes towards the OIS v) Different visions for the introduction of the OIS vi) Project funding vii) Strategy of implementation viii) Project governance ix) Workflow change management x) End-user training support xi) Attitudes toward technology

5. Discussion

The included studies examined a variety of ICT systems utilised in the delivery of cancer care (Boudreaux et al. 2011, Carpenter et al. 2008, Hains et al. 2009, Pare et al. 2009, Whittaker et al. 2009, Yu et al. 2010). There are many claims throughout the literature about the benefits of ICT in supporting medical oncology practice (e.g. Gandhi et al. 2005, Johnson 2006, Shulman et al. 2008). While the included studies catalogued a number of benefits, we found no level 1, randomised evidence. Studies were limited to one system and modest qualitative data sets were assembled in most studies.

Various barriers to and facilitators of use were identified including the receptiveness of the environment and the importance of contextual factors to support use as well as how encouraging were the leaders in the application of the system. Some studies highlighted technical features that contributed to deployment such as ease of use of the system, whether hardware was available in the right place at the right time with sufficient capacity and the extent to which providers were trained to utilise the system effectively. Human factors were held

to be barriers or facilitators to use such as the way ICT was used by clinicians and how integrated the system was with practice.

Where it was measured, satisfaction with some systems was relatively high (Boudreaux et al. 2011, Carpenter et al. 2008). There are reported productivity gains attributable to systems use (Pare et al. 2009).

Overall, the evidence in the literature regarding the impact of ICT on the delivery of medical oncology care is limited and thus there are strong grounds for supporting future research to examine how ICT systems contribute to improved cancer care. Particular areas of focus suggested by this review include how, to what extent and in what ways have ICT systems: changed clinical practices and health care delivery; improved processes; supported best practice; reduced errors or adverse events; and enabled better decision-making, teamwork and communication within provider groups and between providers and patients.

6. Conclusion

There is scope for more extensive, rigorous research designs examining the take up and usage of ICT in the delivery of cancer care. A purpose-designed, advanced framework and model of evaluation are needed, as is a well-designed study with randomised data. Longitudinal data mapping changes in ICT use over time is required.

7. References

Ash JS, Berg M, Coiera E. Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. *Journal of the American Medical Informatics Association* 2004;11:104-12.

Berner E, Detmer D, Simborg D. Will the wave finally break? A brief view of the adoption of electronic medical records in the United States. *Journal of American Medical Informatics Association* 2005;12:3-7.

Boudreaux ED, O'Hea EL, Grissom G, Lord S, Houseman J, Grana G. Initial development of the mental health assessment and dynamic referral for oncology (MHADRO). *Journal of Psychosocial Oncology* 2011;29:83-102.

Braithwaite J, Mannion R. Managing change. In: Walshe K, Smith J, editors. *Healthcare Management*. 2nd ed. London: Open University Press, in press.

Braithwaite J, Westbrook M, Travaglia J. Attitudes toward the large-scale implementation of an incident reporting system. *International Journal for Quality in Health Care* 2008;20:184–91.

Carpenter JS, Rawl S, Porter J, Schmidt K, Tornatta J, Ojewole F, et al. Oncology outpatient and provider responses to a computerized symptom assessment system. *Oncology Nursing Forum* 2008;35:661-9.

DesRoches CM, Campbell EG, Rao SR, Donelan K, Ferris TG, Jha A, et al. Electronic health records in ambulatory care: a national survey of physicians. *New England Journal of Medicine* 2008;359:50-60.

Eccher C, Seyfang A, Ferro A, Miksch S, Eccher C, Seyfang A, et al. Embedding oncologic protocols into the provision of care: the Oncocure project. *Studies in Health Technology & Informatics* 2009;150:663-67.

Ferlay J, Shin H, Bray F, Forman D, Mathers C, Parkin D 2010. GLOBOCAN 2008 v1.2: Cancer incidence and mortality worldwide: IARC CancerBase No. 10 [Internet]. Lyon: International Agency for Research on Cancer. Accessed 17 August 2011 from http://globocan.iarc.fr.

Gagnon M-P, Desmartis M, Labrecque M, Car J, Pagliari C, Pluye P, et al. Systematic review of factors influencing the adoption of information and communication technologies by healthcare professionals. *Journal of Medical Systems* 2010:1-37.

Gandhi T, Bartel S, Shulman L, Verrier D, Burdick E, Cleary A, et al. Medication safety in the ambulatory chemotherapy setting. *Cancer* 2005;104:2477-83.

Greenberg A, Kramer S, Welch V, O'Sullivan E, Hall S. Cancer Care Ontario's computerized physician order entry system: a province-wide patient safety innovation. *Healthcare Quarterly* 2006;9:108-13.

Greenfield D, Travaglia J, Pawsey M, Braithwaite J. Intra-rater and inter-rater reliability in health care accreditation: literature review. Sydney: Centre for Clinical Governance Research in Health, The University of New South Wales, 2007.

Greenhalgh T, Stramer K, Bratan T, Byrne E, Russell J, Potts HWW. Adoption and non-adoption of a shared electronic summary record in England: a mixed-method case study. *British Medical Journal* 2010;340.

Hains IM, Fuller JM, Ward RL, Pearson SA, Hains IM, Fuller JM, et al. Standardizing care in medical oncology: are web-based systems the answer? *Cancer* 2009;115:5579-88.

Hendy J, Reeves BC, Fulop N, Hutchings A, Masseria C. Challenges to implementing the national programme for information technology (NPfIT): a qualitative study. *British Medical Journal* 2005;331:331-36.

Jha AK, Doolan D, Grandt D, Scott T, Bates DW. The use of health information technology in seven nations. *International Journal of Medical Informatics* 2008;77:848-54.

Johnson D. Electronic medical records: possibilities and uncertainties abound. *Journal of Oncology Practice* 2006;2:75-76.

Koppel R, Metlay JP, Cohen A, Abaluck B, Localio AR, Kimmel SE, et al. Role of computerized physician order entry systems in facilitating medication errors. *The Journal of the American Medical Association* 2005;293:1197-203.

Murphy KC. Assessing software impact on clinical workflow and resource utilization. *Studies in Health Technology & Informatics* 2009;143:309-14.

Murray E, Burns J, May C, Finch T, O'Donnell C, Wallace P, et al. Why is it difficult to implement e-health initiatives? A qualitative study. *Implementation Science* 2011;6:6.

Ousley AL, Swarz JA, Milliken EL, Ellis S, Ousley AL, Swarz JA, et al. Cancer education and effective dissemination: information access is not enough. *Journal of Cancer Education* 2010;25:196-205.

Øvretveit J, Scott T, Rundall TG, Shortell SM, Brommels M. Improving quality through effective implementation of information technology in healthcare. *International Journal for Quality in Health Care* 2007;19:259-66.

Pare G, Sicotte C, Chekli M, Jaana M, De Blois C, Bouchard M, et al. A pre-post evaluation of a telehomecare program in oncology and palliative care. *Telemedicine Journal & E-Health* 2009;15:154-9.

Shulman L, Miller R, Ambinder E, Yu P. Principles of safe practice using an oncology EHR system for chemotherapy ordering, preparation, and administration, part 1 of 2. *Journal of Oncology Practice* 2008;4:203-06.

Siochi RA, Balter P, Bloch CD, Bushe HS, Mayo CS, Curran BH, et al. Information technology resource management in radiation oncology. *Journal of Applied Clinical Medical Physics* 2009;10:3116.

Travaglia J, Braithwaite J. Engagement of medical practitioners in health services accreditation: literature review and selected citations. Sydney: Centre for Clinical Governance Research, The University of New South Wales, 2007.

Travaglia J, Braithwaite J, Debono D. Protocol for the rapid assessment, conceptualisation and timely concise analysis of the literature [PRACTICAL]. Sydney: Centre for Clinical Governance Research, The University of New South Wales, 2008.

Voeffray M, Pannatier A, Stupp R, Fucina N, Leyvraz S, Wasserfallen J-B. Effect of computerisation on the quality and safety of chemotherapy prescription. *Quality and Safety in Health Care* 2006;15:418-21.

Westbrook JI, Braithwaite J. Will information and communication technology disrupt the health system and deliver on its promise? *The Medical Journal of Australia* 2010;193:399-400.

Whittaker AA, Aufdenkamp M, Tinley S, Whittaker AA, Aufdenkamp M, Tinley S. Barriers and facilitators to electronic documentation in a rural hospital. *Journal of Nursing Scholarship* 2009;41:293-300.

Woolf SH. The meaning of translational research and why it matters. *Journal of the American Medical Association* 2008;299:211-13.

World Health Organisation 2011. Cancer fact sheet. World Health Organisation. Accessed 17 August 2011 from http://www.who.int/mediacentre/factsheets/fs297/en/.

Yu P, Gandhidasan S, Miller AA, Yu P, Gandhidasan S, Miller AA. Different usage of the same oncology information system in two hospitals in Sydney--lessons go beyond the initial introduction. *International Journal of Medical Informatics* 2010;79:422-9.

8. Appendix: abstracts

Abernethy, A. P., A. Ahmad, et al. (2010). "Electronic patient-reported data capture as a foundation of rapid learning cancer care." Medical Care 48(6 Suppl): S32-38.

BACKGROUND: "Rapid learning healthcare" presents a new infrastructure to support comparative effectiveness research. By leveraging heterogeneous datasets (eg, clinical, administrative, genomic, registry, and research), health information technology, and sophisticated iterative analyses, rapid learning healthcare provides a real-time framework in which clinical studies can evaluate the relative impact of therapeutic approaches on a diverse array of measures. PURPOSE: This article describes an effort, at 1 academic medical center, to demonstrate what rapid learning healthcare might look like in operation. The article describes the process of developing and testing the components of this new model of integrated clinical/research function, with the pilot site being an academic oncology clinic and with electronic patient-reported outcomes (ePROs) being the foundational dataset. RESEARCH DESIGN: Steps included: feasibility study of the ePRO system; validation study of ePRO collection across 3 cancers; linking ePRO and other datasets; implementation; stakeholder alignment and buy in, and; demonstration through use cases. SUBJECTS: Two use cases are presented; participants were metastatic breast cancer (n = 65) and gastrointestinal cancer (n = 113) patients at 2 academic medical centers. RESULTS: (1) Patient-reported symptom data were collected with tablet computers; patients with breast and gastrointestinal cancer indicated high levels of sexual distress, which prompted multidisciplinary response, design of an intervention, and successful application for funding to study the intervention's impact. (2) The system evaluated the longitudinal impact of a psychosocial care program provided to patients with breast cancer. Participants used tablet computers to complete PRO surveys; data indicated significant impact on psychosocial outcomes, notably distress and despair, despite advanced disease. Results return to the clinic, allowing iterative update and evaluation. CONCLUSIONS: An ePRO-based rapid learning cancer clinic is feasible, providing real-time research-quality data to support comparative effectiveness research.

Abernethy, A. P., L. M. Etheredge, et al. (2010). "Rapid-learning system for cancer care." Journal of Clinical Oncology 28(27): 4268-4274.

Compelling public interest is propelling national efforts to advance the evidence base for cancer treatment and control measures and to transform the way in which evidence is aggregated and applied. Substantial investments in health information technology, comparative effectiveness research, health care quality and value, and personalized medicine support these efforts and have resulted in considerable progress to date. An emerging initiative, and one that integrates these converging approaches to improving health care, is "rapid-learning health care." In this framework, routinely collected real-time clinical data drive the process of scientific discovery, which becomes a natural outgrowth of patient care. To better understand the state of the rapid-learning health care model and

its potential implications for oncology, the National Cancer Policy Forum of the Institute of Medicine held a workshop entitled "A Foundation for Evidence-Driven Practice: A Rapid-Learning System for Cancer Care" in October 2009. Participants examined the elements of a rapid-learning system for cancer, including registries and databases, emerging information technology, patient-centered and -driven clinical decision support, patient engagement, culture change, clinical practice guidelines, point-of-care needs in clinical oncology, and federal policy issues and implications. This Special Article reviews the activities of the workshop and sets the stage to move from vision to action.

Adler, J., Y. Paelecke-Habermann, et al. (2009). "Patient information in radiation oncology: a cross-sectional pilot study using the EORTC QLQ-INFO26 module." Radiation Oncology 4: 40.

BACKGROUND: The availability of alternative sources of information, e. g. the internet, may influence the quantity and quality of information cancer patients receive regarding their disease and treatment. The purpose of the present study was to assess perception of information in cancer patients during radiotherapy as well as media preferences and specifically the utilization of the internet. METHODS: In a cross-sectional, single-centre study 94 patients currently undergoing radiotherapy were asked to complete two questionnaires. The EORTC QLQ-INFO26 module was used to assess the quality and quantity of information received by patients in the areas disease, medical tests, treatment, other services, different places of care and how to help themselves, as well as qualitative aspects as helpfulness of and satisfaction with this information. The importance of different media, in particular the internet, was investigated by a nine-item questionnaire. RESULTS: The response rate was n = 72 patients (77%). Patients felt best informed concerning medical tests (mean +/- SD score 79 +/- 22, scale 0-100) followed by disease (68 +/- 21). Treatment (52 +/- 24) and different places of care and other services (30 +/- 36 and 30 +/- 30, respectively) ranked last. 37% of patients were very satisfied and 37% moderately satisfied with the amount of information received, 61% wished more information. Among eight media, brochures, television and internet were ranked as most important. 41% used the internet themselves or via friends or family, mostly for research of classic and alternative treatment options. Unavailability and the necessity of computer skills were most mentioned obstacles. CONCLUSION: In a single-center pilot study, radiotherapy patients indicated having received most information about medical tests and their disease. Patients very satisfied with their information had received the largest amount of information. Brochures, television and internet were the most important media. Individual patient needs should be considered in the development of novel information strategies.

Adnani, N. (2010). "Design and clinical implementation of a TG-106 compliant linear accelerator data management system and MU calculator." Journal of Applied Clinical Medical Physics 11(3): 3212.

In an attempt to minimize errors and improve patient outcome in radiation therapy, a linear accelerator data management system was developed to provide

radiation oncology physicists with a set of computerized tools to manage linear accelerator physics data. The entire program is written in Microsoft Visual Basic and has a user-friendly, front-end window with the following features and modules: (1) Generate, edit and approve commissioning and QA reports and other regulatory documents, (2) Configure commissioning tasks, (3) Acquire output factors, (4) Import scanned data, (5) Import PDD, TMRs and OAR tables directly from the scanning software, (6) Query physics data such as TMR, PDDs, OFs, and WFs, (7) Compare physics data to a different machine or a standard, (8) Compare physics data from the same machine (e.g. during annual calibrations), (9) Perform MU calculations on plans exported from the planning system via DICOM RT, (10) Perform TG-51 calibration, (11) Perform monthly calibration, (12) FTP physics data for purposes of remote peer review and/or inspections.

Agarwal, V. and P. O'Neill (2011). "Adjuvant! Online as a decision-making tool in early breast cancer--a UK national survey." Clinical Oncology (Royal College of Radiologists) 23(2): 159-160.

Ahmed, K. E., W. Q. Chen, et al. (2010). "Complete sequencing of the recombinant granulocyte-colony stimulating factor (filgrastim) and detection of biotinylation by mass spectrometry." Amino Acids 38(4): 1043-1049.

Granulocyte-colony stimulating factor stimulates production and antibacterial function of neutrophiles. Therapy using the recombinant protein drug represents a major step forward in oncology. The protein has not been, however, completely sequenced at the protein level and this formed the rationale of the current study. Recombinant G-CSF (filgrastim) was run on two-dimensional gel electrophoresis (2DE), the protein was in-gel digested with trypsin and chymotrypsin, and peptides were analysed on Nano-ESI-LC-MS/MS (high performance ion trap, HCT). Bioinformatic tools used were Mascot v2.2 and Modiro(TM) v1.1 softwares. A single spot was detected on 2DE and peptides resulting from in-gel digestion were unambiguously identified by the MS/MS approach leading to complete sequencing when both searching engines were applied. N-terminal methionine loss, N-terminal methionine oxidation and amidination were observed. Both softwares identified modifications. Complete sequencing by a non-sophisticated and rapid gel-based mass spectrometry approach confirmed the primary structure predicted from nucleic acid sequences. A chemical modification of glutamine 26 with the interim name PentylamineBiotin (Unimod accession number #800) compatible with biotinylation with 5-(biotinamido) pentylamine by the producer was detected by both softwares. Although there is some evidence that biotinylated G-CSF analogues are active, it remains open whether this modification may be responsible for the side effects observed or lead to changes of antigenicity.

Akhtar, S. S., H. M. Nadrah, et al. (2010). "First organized screening mammography programme in Saudi Arabia: preliminary analysis of pilot round." Eastern Mediterranean Health Journal 16(10): 1025-1031.

The aim of this study was to analyse results of the pilot screening round for Al-Qassim Screening Mammography Programme and compare with international standards. Analysis was conducted in the central screening office in Prince Faisal Oncology Centre, which coordinates activities of various screening units. Data were collected during the period 1 January 2007 to 30 June 2008. Organizational and functional information was obtained from policy and procedure manuals of the programme. Out of 9812 eligible women, 1766 (18%) participated and data were available for 1628 (16.6%). The median age of participants was 47 (standard deviation 8.12) years. The low uptake rate (18%) and a high recall rate (31.6%) characterized the pilot screening round. Biopsy rate was 1.5% and cancer detection rate was 0.24%. Many performance indicators in this pilot screening round were not available. Many of the available indicators did not meet international standards.

Albrecht, T. L., L. A. Penner, et al. (2009). "Studying the process of clinical communication: issues of context, concepts, and research directions." Journal of Health Communication 14 Suppl 1: 47-56.

Much cancer-related health communication research has involved studies of the effects of media campaigns and strategies on secondary prevention. Cancer diagnosis rates, however, continue to affect millions of people. The need exists for communication studies to address the quality of the clinical interaction, the point of actual care delivery in addressing diagnosis, treatment, and survivorship. Using examples from a 6-year communication and behavioral oncology research program established at the Karmanos Cancer Institute (KCI) in Detroit, Michigan, we describe selected empirical issues; models, particularly the "convergence model" (adapted from Rogers & Kincaid, 1981); and associated constructs that are relevant and promising foundations for building future research in cancer clinical settings. Two examples from our empirical research program are described.

Alzimami, K. S., S. A. Sassi, et al. (2010). "Preliminary Monte Carlo study of (18)F-FDG SPECT imaging with LaBr(3):Ce Crystal-based Gamma Cameras." Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2010: 3089-3092.

The utility of (18)F-deoxyglucose ((18)F-FDG) in oncology, cardiology, and neurology has generated great interest in a more economical ways of imaging (18)F-FDG than conventional PET scanners. The main thrust of this work is to investigate the potential use of LaBr(3):Ce materials in a low-cost FDG-SPECT system compared to NaI(Tl) using GATE Monte Carlo simulation. System performance at 140 keV and 511 keV was assessed using energy spectra, system sensitivity and count rate performance. Comparison of the LaBr(3):Ce and NaI(Tl) crystal-based systems showed 4.5% and 8.9% higher system sensitivity for the LaBr(3):Ce at 140 keV and 511 keV, respectively. The LaBr(3):Ce scintillator significantly improves intrinsic count rate performance due to its fast decay time with respect to NaI(Tl). In conclusion, because LaBr(3):Ce crystal combines excellent intrinsic count rate performance with slightly increased

system sensitivity, it has the potential to be used for (18)F-FDG -SPECT systems.

Amin, V., L. Wu, et al. (2008). "Therapy planning and monitoring of tissue ablation by high intensity focused ultrasound (HIFU) using imaging and simulation." Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2008: 4471.

High intensity focused ultrasound (HIFU) 'cooks' or ablates the target tissue at the focus of the ultrasound beam by thermal and cavitation effects. The HIFU is emerging as a non-invasive method for tumor ablation. The HIFU application for tissue ablation requires tools for dosimetry therapy planning, and real-time feedback of the intended and actual target tissues. Pretreatment planning is an important step for a successful HIFU therapy outcome. Typically, the therapy planning approach involves the use of pretreatment imaging data, defining the target and surrounding tissues by manual or semiautomatic segmentation, development of a 3-D anatomy model of the region of interest from segmentation or registration with a reference dataset, simulation of the HIFU beam and thermal dosimetry around the target tissue, display and 3-D visualization of imaging and simulation data, and review of the treatment plan options. Recent developments in therapy planning using imaging are targeted for specific applications such as prostate cancer using 3-D ultrasound images and uterine fibroids using MRI. However, significant developments have been accomplished in image guidance and feedback during the delivery of HIFU treatments. This talk reviews recent work towards therapy planning and presents approaches for developing strategies for HIFU therapy. It describes general and target-specific techniques and software tools for HIFU treatment planning using pretherapy imaging, and monitoring and controlling the HIFU delivery and tissue lesion using 1D, 2D and 3D ultrasound imaging. This aids development of optimized, high-precision HIFU applications for a controlled ablation of the target tumor. It also potentially reduces the overall treatment duration and exposure to non-target tissues.

Andam, R. and M. Silva (2008). "A journey to pediatric chemotherapy competence." Journal of Pediatric Nursing 23(4): 257-268.

Chemotherapy and biotherapy use has increased due to its effectiveness as a treatment for childhood cancer. Nurses need to demonstrate knowledge of these agents' mechanism of action, adverse effects, safe handling, and monitoring parameters. Competence of nurses administering chemotherapy and biotherapy needs to be assessed to ensure safety and quality care. Review of literature reveals that a comprehensive education program and skills validation are the most thorough means of assessing chemotherapy competency. The chemotherapy competency program at the Children's National Medical Center (CNMC) was evaluated and was noted to be inadequate. Although a self-learning module on intravenous push chemotherapy administration and a 1-hour lecture on chemotherapy administration were offered during orientation, there was limited reevaluation of competence at regular intervals. As a result of a literature review, multi-institutional surveys, and intensive review of the CNMC

chemotherapy administration module, a comprehensive chemotherapy/biotherapy competency program was developed for nurses administering chemotherapeutic agents. The CNMC chemotherapy competency program was formed with a didactic content course utilizing the Oncology Nursing Society Chemotherapy/Biotherapy Provider Course combined with initial and yearly skills validation. After offering both the didactic portion and three-part competency skills set, nurses have indicated improved satisfaction with the methodology of achieving chemotherapy competency.

Ang, E. and Y. L. Chow (2010). "General pain assessment among patients with cancer in an acute care setting: a best practice implementation project." International Journal of Evidence-Based Healthcare 8(2): 90-96.

AIMS: This project sought to determine improve local practice in managing patients with cancer. It involved by: educating Registered Nurses on the importance of pain assessment, and ensuring this practice is done according to the current best available evidence and monitoring compliance with the audit criteria. METHODS: This project utilised a pre- and post-implementation audit strategy using the Joanna Briggs Institute Practical Application of Clinical Evidence System and Getting Research Into Practice programs. It was implemented in three phases over a 6-month period, from September 2009 to February 2010. The audits utilised three out of 10 criteria recommended by The National Health Service Quality Improvement Scotland. The audits took place in a 24-bed oncology ward in a large acute care setting in Singapore involving a sample size of 24 patients and Registered Nurses. It involved going through the clinical charts and medical records of the cases, and educating Registered Nurses on pain assessment for patients with cancer. RESULTS: The post-implementation audit findings indicated a modest to significant improvement in all the three criteria: first, an improvement of 33% through using a pain assessment tool to assess pain in patients with cancer; second, a 75% increase in the number of Registered Nurses who received education on pain assessment; and third, a 46% increase in accuracy in the assessment and documentation of pain. CONCLUSION: The project had shown that pre- and post-implementation audits represent a useful method for translating evidence into practice. The conduct of this project showed that achieving change in clinical practice was challenging. It also showed that positive audit results were achieved through the enthusiasm, commitment and dedication of every member of the project team, the use of champions who were involved in direct patient care and performance feedback. Copyright 2010 The Authors. Journal Compilation Copyright Blackwell Publishing Asia Pty Ltd.

Anonymous (2009). "StatBite: 2007 vs. 2008: Electronic Medical Records Adoption in United States' Practices." Journal of the National Cancer Institute 101(14): 977.

Arenella, C., B. Finke, et al. (2010). "Adaptation, dissemination, and evaluation of a cancer palliative care curriculum for the Indian health system." Journal of Palliative Care 26(1): 15-21.

In 2006, the Indian Health Service (IHS) and the National Cancer Institute (NCI) collaborated to develop an interdisciplinary palliative training program for health professionals in the Indian health system. Their goal was to improve clinician knowledge and skills in palliative care, to train future trainers, and to increase access to palliative care for American Indians and Alaska Natives. The combined program of participant self-study utilizing a multimedia CD-ROM and train-the-trainer seminars followed the curriculum entitled Education in Palliative and End-of-Life Care for Oncology (EPEC-O) with American Indian and Alaska Native Cultural Considerations. Three seminars trained 89 interdisciplinary health providers from throughout the Indian health system. Evaluations demonstrated increased clinician self-reported knowledge and confidence to train and high satisfaction with training. Forty-two of 67 participants completed an anonymous post-conference Web questionnaire. Nearly half had conducted or definitively planned palliative education sessions, and 57 percent started new palliative services at their practice sites.

Arenella, C., S. Yox, et al. (2010). "Expanding the reach of a cancer palliative care curriculum through Web-based dissemination: a public-private collaboration." Journal of Cancer Education 25(3): 418-421.

Deficiencies in palliative and end-of-life care have been well documented by the Institute of Medicine. The National Cancer Institute (NCI), in partnership with Northwestern University, developed an educational curriculum for clinicians who deal with end-of-life issues, the Education in Palliative and End-of-Life Care for Oncology. A live meeting was held to distribute the curriculum to institutional leaders who could take it back to their organizations for broader distribution. To further distribute the materials and ensure they were available whenever a clinician wanted to view them, NCI collaborated with a leading online medical education provider whose websites are visited by over 1,500,000 physicians per month (http://cme.medscape.com) to post one module of the curriculum as an online activity certified for physician and nurse continuing education credit. The module is entitled "Last Hours of Living: Practical Advice for Clinicians." A descriptive analysis of the first 7 months of publication was performed. Twenty thousand sixty-one health professionals completed the activity during this time period and earned continuing education credit. Eighty-four percent completed the post-activity evaluation survey. Satisfaction was very high among participants, and many indicated their intention to incorporate new knowledge into practice. Collaboration with a commonly used online medical education provider such as Medscape is effective at broadly disseminating palliative care education to health professionals.

Arnaboldi, P., F. N. Lupo, et al. (2010). "A psychosocial cancer phone center staffed by professional psychologists as an integral part of the standard process of care: Its utility during the course of illness." Palliative & Supportive Care 8(3): 305-312.

OBJECTIVE: Major cancer centers cannot ignore psychosocial patient needs that have a significant impact on the process of adjustment to cancer and on compliance to treatments. We introduced a new service, the Gigi Ghirotti

Psychosocial Cancer Phone Center (GGPCPC), staffed by professional psychologists, for use by our patients and their relatives. This article investigates its feasibility as a support delivery vehicle for patients in their follow-up phase, and also investigates patients' sense of abandonment related to their care setting. METHOD: A close collaboration was set up between GGPCPC psychologists and European Institute of Oncology (IEO) psychologists. Education and awareness sessions regarding the importance of such a source of psychological support were conducted by IEO psychologists with nurses, secretaries, and receptionists. IEO psychologists input monthly data, recorded on specific paper-tabs by GGPCPC psychologists for each call received by the phone center between March 2007 and March 2009, into a SPSS database. RESULTS: Four hundred and thirty individuals contacted the center mainly to receive psychological support during their treatment phase, when they visited IEO for treatment sessions. Multiple indicators suggest that this telephone support program was feasible and provided support to a broad range of cancer patients. Patients seemed to prefer it to face-to-face psychological support during their treatment-phase. SIGNIFICANCE OF RESULTS: The GGPCPC was demonstrated to be an efficacious support and information delivery vehicle for patients and relatives during the illness course.

Azim, H. A., A. R. Jazieh, et al. (2010). "The Abu Dhabi declaration: why the hustle?" Journal of the National Comprehensive Cancer Network 8 Suppl 3: S2-4.

Barrett, J. S., B. Jayaraman, et al. (2008). "A SAS-based solution to evaluate study design efficiency of phase I pediatric oncology trials via discrete event simulation." Computer Methods & Programs in Biomedicine 90(3): 240-250.

Previous exploration of oncology study design efficiency has focused on Markov processes alone (probability-based events) without consideration for time dependencies. Barriers to study completion include time delays associated with patient accrual, inevaluability (IE), time to dose limiting toxicities (DLT) and administrative and review time. Discrete event simulation (DES) can incorporate probability-based assignment of DLT and IE frequency, correlated with cohort in the case of DLT, with time-based events defined by stochastic relationships. A SAS-based solution to examine study efficiency metrics and evaluate design modifications that would improve study efficiency is presented. Virtual patients are simulated with attributes defined from prior distributions of relevant patient characteristics. Study population datasets are read into SAS macros which select patients and enroll them into a study based on the specific design criteria if the study is open to enrollment. Waiting times, arrival times and time to study events are also sampled from prior distributions; post-processing of study simulations is provided within the decision macros and compared across designs in a separate post-processing algorithm. This solution is examined via comparison of the standard 3+3 decision rule relative to the "rolling 6" design, a newly proposed enrollment strategy for the phase I pediatric oncology setting.

Barrett, K., N. Mistry, et al. (2008). "The effectiveness of the Ivan H. Smith Memorial

Studentships program on encouraging medical students to pursue a career in radiation oncology." Journal of Cancer Education 23(4): 226-229.

BACKGROUND: Founded in 1963, the Ivan H. Smith Memorial Studentship (ISMS) is a summer program that familiarizes students with the work of several cancer centers and aims to attract medical students into oncology. METHODS: In this study, we attempted to evaluate the impact of the ISMS Program on career choice in radiation oncology (RO). RESULTS: There were 5.9 times as many ISMS recipients from 1971 to 1981 who completed training in RO compared to the number of graduates exiting post-MD training in RO in 1989. CONCLUSION: Although few former ISMS students entered RO, the ISMS encourages medical students into this field.

Barton, M. B. and R. J. Thode (2010). "Distance learning in the Applied Sciences of Oncology." Radiotherapy & Oncology 95(1): 129-132.

BACKGROUND: The major impediment to the expansion of oncology services is a shortage of personnel. PURPOSE: To develop a distance learning course for radiation oncology trainees. MATERIALS: Under the sponsorship of the Asia Pacific Regional Cooperative Agreement administered by the International Atomic Energy Agency (IAEA), a CD ROM-based Applied Sciences of Oncology (ASOC) distance learning course of 71 modules was created. The course covers communications, critical appraisal, functional anatomy, molecular biology, pathology. The materials include interactive text and illustrations that require students to answer questions before they can progress. The course aims to supplement existing oncology curricula and does not provide a qualification. It aims to assist students in acquiring their own profession's qualification. The course was piloted in seven countries in Asia, Africa and Latin America during 2004. After feedback from the pilot course, a further nine modules were added to cover imaging physics (three modules), informed consent, burnout and coping with death and dying, Economic analysis and cancer care, Nutrition, cachexia and fatigue, radiation-induced second cancers and mathematical tools and background for radiation oncology. The course was widely distributed and can be downloaded from http://www.iaea.org/Publications/Training/Aso/register.html. ASOC has been downloaded over 1100 times in the first year after it was posted. There is a huge demand for educational materials but the interactive approach is labour-intensive and expensive to compile. The course must be maintained to remain relevant. Copyright 2010 Elsevier Ireland Ltd. All rights reserved.

Begent, R. (2009). "Oncology Information Exchange opens up databases." Lancet Oncology 10(8): 755.

Bekelman, J. E., S. Wolden, et al. (2009). "Head-and-neck target delineation among radiation oncology residents after a teaching intervention: a prospective, blinded pilot study." International Journal of Radiation Oncology, Biology, Physics 73(2): 416-423.

PURPOSE: We conducted this study to determine the feasibility of incorporating a teaching intervention on target delineation into the educational curriculum of a radiation oncology residency program and to assess the short-term effects on

resident skills. METHODS AND MATERIALS: The study schema consisted of a baseline evaluation, the teaching intervention, and a follow-up evaluation. At the baseline evaluation, the participants contoured three clinical tumor volumes (CTVs) (70 Gy, 59.4 Gy, and 54 Gy) on six contrast-enhanced axial computed tomography images of a de-identified patient with Stage T2N2bM0 squamous cell carcinoma of the right base of the tongue. The participants attended a series of head-and-neck oncology and anatomy seminars. The teaching intervention consisted of a didactic lecture and an interactive hands-on practical session designed to improve the knowledge and skills for target delineation in the head and neck. At the follow-up evaluation, the residents again contoured the CTVs. RESULTS: Of the 14 eligible residents, 11 (79%) actually participated in the study. For all participants, but especially for those who had not had previous experience with head-and-neck target delineation, the teaching intervention was associated with improvement in the delineation of the node-negative neck (CTV 54 Gy contour). Regardless of clinical experience, participants had difficulty determining what should be included in the CTV 59.4 Gy contour to ensure adequate coverage of potential microscopic disease. CONCLUSION: Incorporating a teaching intervention into the education curriculum of a radiation oncology residency program is feasible and was associated with short-term improvements in target delineation skills. Subsequent interventions will require content refinement, additional validation, longer term follow-up, and multi-institutional collaboration.

Belard, A., B. Tinnel, et al. (2009). "Development of a remote proton radiation therapy solution over internet2." Telemedicine Journal & E-Health 15(10): 998-1004.

Through our existing partnership, our research program has leveraged the benefits of proton radiation therapy through the development a robust telemedicine solution for remote proton therapy planning. Our proof-of-concept system provides a cost-effective and functional videoconferencing desktop platform for both ad-hoc and scheduled communication, as well as a robust interface for data collaboration (application-sharing of a commercial radiation treatment planning package). Over a 2-year period, our evaluation of this model has highlighted the inherent benefits of this affordable remote treatment planning solution, i.e., (1) giving physicians the ability to remotely participate in refining and generating proton therapy plans via a secure and robust Internet2 VPN tunnel to the University of Pennsylvania's commercial proton treatment planning package; (2) allowing cancer-care providers sending patients to a proton treatment facility to participate in treatment planning decisions by enabling referring or accepting providers to initiate ad-hoc, point-to-point communication with their counterparts to clarify and resolve issues arising before or during patient treatment; and thus (3) allowing stewards of an otherwise highly centralized resource the ability to encourage wider participation with and referrals to sparsely located proton treatment centers by adapting telemedicine techniques that allow sharing of proton therapy planning services. We believe that our elegant and very affordable approach to remote proton treatment planning opens the door to greater worldwide referrals to the scarce resource of proton treatment

units and wide-ranging scientific collaboration, both nationally and internationally.

Bertsche, T., V. Askoxylakis, et al. (2009). "Multidisciplinary pain management based on a computerized clinical decision support system in cancer pain patients." Pain 147(1-3): 20-28.

A prospective controlled intervention cohort study in cancer pain patients (n=50 per group) admitted to radiation oncology wards (62 beds, 3 wards) was conducted in a 1621-bed university hospital. We investigated the effect of an intervention consisting of daily pain assessment using the numeric visual analog scale (NVAS) and pain therapy counseling to clinicians based on a computerized clinical decision support system (CDSS) to correct deviations from pain therapy guidelines. Effects on guideline adherence (primary outcome), pain relief (NVAS) at rest and during physical activity (both groups: cross-sectional assessment on day 5; intervention group: every day assessment), co-analgesic prescription, and acceptance rates of recommendations (secondary outcomes) were assessed. The number of patients with at least one deviation from guidelines at discharge was decreased by the intervention from 37 (74%) in controls to 7 (14%, p<0.001). In the intervention group, pain (NVAS) decreased during hospital stay at rest from 3.0 (Delta(0.5) (Q(75%)-Q(25%))=3.0) on admission to 1.5 (Delta(0.5)=1.0) at discharge (p<0.01) and during physical activity from 7.0 (Delta(0.5)=4.0) on admission to 2.5 (Delta(0.5)=3.8) at discharge (p<0.001). At discharge, the number of patients treated with co-analgesics increased from 23 (46%) in controls to 33 (66%) in the intervention group (p=0.04). From 279 recommendations issued in the intervention 85% were fully accepted by the physicians. Deviations from well-established guidelines are frequent in pain therapy. A multidisciplinary pain management increased adherence to pain management guidelines.

Bingen, K. and M. J. Kupst (2010). "Evaluation of a survivorship educational program for adolescent and young adult survivors of childhood cancer." Journal of Cancer Education 25(4): 530-537.

Educational programs to address specific needs of adolescent and young adult (AYA) childhood cancer survivors are scarce. A quarterly speaker series and 1-day conference involved presentations by oncology experts to increase knowledge of AYA cancer survivorship issues and awareness of community programs and resources. Pre- and post-evaluations were administered to determine the program's efficacy. Most rated program satisfaction as "moderately high" to "high" and having met expectations. Self-report ratings indicated a significant increase in perceived knowledge of survivorship topics and resource awareness for AYA childhood cancer survivors and caregivers. Nearly one third attended more than one presentation, indicating that the educational program was beneficial to them. This program was effective in increasing self-reported survivorship education for AYA survivors of childhood cancer, families, and health care providers.

Blayney, D. W., K. McNiff, et al. (2009). "Implementation of the Quality Oncology

Practice Initiative at a university comprehensive cancer center." Journal of Clinical Oncology 27(23): 3802-3807.

PURPOSE: The Quality Oncology Practice Initiative (QOPI) is a voluntary program developed by the American Society of Clinical Oncology (ASCO) to aid oncology practices in quality self-assessment. Few academic cancer centers have been QOPI participants. METHODS: We implemented the QOPI process at the University of Michigan Comprehensive Cancer Center, a large, hospital-based academic cancer center, and report our experience with five rounds of data collection. Patient medical records were selected using QOPI-specified procedures and abstracted locally; results were entered into an ASCO-maintained database and analyzed. RESULTS: Abstractors who were not directly involved with patient care required an average of 62.3 minutes per medical record (4.7 minutes per data element) to abstract data. We found that compliance with quality measures was uniformly high when measures were structured into our electronic medical record. Results from other measures, including those measuring chemotherapy administration in the last 2 weeks of life, were initially markedly different from those reported by other QOPI participants. Our practice changed toward the QOPI national practice norm after a presentation of the results at a faculty research conference. We found that other measures were consistently greater than 90%, including disease-specific diagnosis and treatment measures. CONCLUSION: Measuring and showing performance data to physicians was sufficient to change some aspects of physician behavior. Improvement in other measures requires structural practice changes. QOPI, an oncologist-developed system, can be adapted for use in practice improvement at an academic medical center.

Bliznakova, K., S. Suryanarayanan, et al. (2010). "Evaluation of an improved algorithm for producing realistic 3D breast software phantoms: application for mammography." Medical Physics 37(11): 5604-5617.

PURPOSE: This work presents an improved algorithm for the generation of 3D breast software phantoms and its evaluation for mammography. METHODS: The improved methodology has evolved from a previously presented 3D noncompressed breast modeling method used for the creation of breast models of different size, shape, and composition. The breast phantom is composed of breast surface, duct system and terminal ductal lobular units, Cooper's ligaments, lymphatic and blood vessel systems, pectoral muscle, skin, 3D mammographic background texture, and breast abnormalities. The key improvement is the development of a new algorithm for 3D mammographic texture generation. Simulated images of the enhanced 3D breast model without lesions were produced by simulating mammographic image acquisition and were evaluated subjectively and quantitatively. For evaluation purposes, a database with regions of interest taken from simulated and real mammograms was created. Four experienced radiologists participated in a visual subjective evaluation trial, as they judged the quality of the simulated mammograms, using the new algorithm compared to mammograms, obtained with the old modeling approach. In addition, extensive quantitative evaluation included power spectral analysis and

calculation of fractal dimension, skewness, and kurtosis of simulated and real mammograms from the database. RESULTS: The results from the subjective evaluation strongly suggest that the new methodology for mammographic breast texture creates improved breast models compared to the old approach. Calculated parameters on simulated images such as beta exponent deducted from the power law spectral analysis and fractal dimension are similar to those calculated on real mammograms. The results for the kurtosis and skewness are also in good coincidence with those calculated from clinical images. Comparison with similar calculations published in the literature showed good agreement in the majority of cases. CONCLUSIONS: The improved methodology generated breast models with increased realism compared to the older model as shown in evaluations of simulated images by experienced radiologists. It is anticipated that the realism will be further improved using an advanced image simulator so that simulated images may be used in feasibility studies in mammography.

Boddy, K. and E. Ernst (2008). "Review of reliable information sources related to integrative oncology." Hematology - Oncology Clinics of North America 22(4): 619-630.

Health care professionals, patients, and care givers require access to good quality, reliable information about integrative oncology. Despite the vast resources available, it can be difficult to find objective, evidence-based information. This article provides an overview of reliable integrative oncology information from various resources. Selection methods are detailed and evaluation performed using a validated instrument. Resources that met the selection criteria and produced high evaluation scores are reviewed in detail. Resources include research databases, clinical databases, online information systems, and print media. [References: 22]

Bogaerts, J., R. Ford, et al. (2009). "Individual patient data analysis to assess modifications to the RECIST criteria." European Journal of Cancer 45(2): 248-260.

BACKGROUND: After the initial RECIST 1.0 were published in 2000, the criteria were widely implemented in the scientific oncology community. Since then, the RECIST working group has identified several issues to examine further. Two key issues that required careful, data-based assessment were the maximum number of lesions that should be assessed at each evaluation and the added value of requiring confirmation of response. METHODS: To address these questions, data were obtained from 16 clinical trials in metastatic cancer, with patients enrolled between 1993 and 2005. A total of 6512 patients were included in the primary analysis dataset, accounting for over 18,000 potential target lesions. Nine percent of the included patients (n=585) had six or more reported target lesions. The response and progression outcomes in the database were calculated using an adjusted RECIST methodology with a maximum of 5 (or 3) target lesions with/without confirmation and this was compared to the original RECIST version 1.0 which required up to 10 target lesions plus confirmation of response. RESULTS: Assessment of 5 lesions per patient led to a difference in best overall response assignment for an estimated 209 (3.2%) patients as compared to RECIST version 1.0. However, these changes did not affect the

overall response rate. Progression-free survival was only minimally affected by measuring fewer lesions. In contrast, removing the requirement for response confirmation led to a significant increase in the numbers of patients classified as responders, resulting in a relative increase of approximately 19% in response rate. An algorithm using a maximum of three target lesions shows high concordance with the 10 lesions requirement in terms of response and TTP assignment. Concern that appropriate assessment of disease within an organ requires two lesions to be followed per organ suggests the approach of following two target lesions per organ, up to a maximum of five target lesions overall. Both strategies seem reasonable based on the data warehouse. The requirement of response confirmation in trials where this is a primary end-point is recommended to be maintained as its removal would substantially increase reported response rates.

Bonan, B., N. Martelli, et al. (2010). "FabAct: a decision-making tool for the anticipation of the preparation of anticancer drugs." Journal of Evaluation in Clinical Practice 16(6): 1129-1135.

RATIONALE: Due to the increase of new cancer cases, our chemotherapy compounding unit must face with ever-growing production needs. To support this increasing workload, we decided to anticipate the preparation of several anti-cancer drugs. AIMS AND OBJECTIVES: To help us in the decision making, we needed a modern tool able to combine several criteria for selecting appropriate medications for an anticipated preparation. The aim of this study was to assess the decision-making software, FabAct() (Version 1.0). METHODS: FabAct() ranked all of the anti-cancer drugs used in our chemotherapy compounding unit according to price, chemical stability, compounding difficulties, dosage and production per year. Then, we started to anticipate currently the preparation of four medications and conducted a follow-up of destroyed preparations between January and May 2007. We tried to identify the destruction causes and calculated the time saved for the patients and for the pharmacy technicians. RESULTS: According to the decision-making software, the first four drugs for an anticipated preparation were: fluorouracil, cisplatin, carboplatin and paclitaxel. A total of 3913 (50.2%) anticipated preparations were performed and among those, 470 (12%) were destroyed. The main cause of destruction was due to the preparation expiration. Finally, the mean waiting time per patient was reduced from 118 minutes to 68 minutes after the application of the anticipated model. CONCLUSION: According to this 5-month follow-up, FabAct() helped us to select appropriate anti-cancer drugs to anticipate the compounding. Most of the anticipated preparations were administrated to patients and the patient waiting time was significantly reduced. Copyright 2010 Blackwell Publishing Ltd.

Bossema, E. R., C. A. Marijnen, et al. (2008). "Evaluation of the treatment tradeoff method in rectal cancer patients: is surgery preference related to outcome utilities?" Medical Decision Making 28(6): 888-898.

BACKGROUND: The treatment tradeoff method (TTM) has been developed specifically for decision making at the level of the individual patient. The task is

tailored to the clinical decision problem at hand and may therefore be more relevant to patients than methods of outcome valuation. Despite its wide use in oncology research, few methodological studies regarding validity have been conducted. OBJECTIVE AND METHODS: The present study evaluates the validity of the TTM in rectal cancer patients who had undergone either 1 of 2 surgery types: 1 requiring a permanent stoma (stoma group) and 1 involving a postoperative risk of fecal incontinence (no-stoma group). The authors relate the surgery preference scores to the utilities of the 2 main surgery outcome states as well as to their utility difference. RESULTS: Surgery preference was more strongly associated with the utility difference ($r > 0.54$ in the total patient group) than with the utilities of the surgery outcome states per se ($r < 0.44$ in the total patient group). In the stoma group, surgery preference was especially related to the utility of incontinence and in the no-stoma group especially to the utility of a permanent stoma. CONCLUSIONS: Patients indeed use their valuations of treatment outcomes states, especially those they are less familiar with, in determining their preference for one treatment over another. In clinical practice, the TTM may be used to obtain an indication of the treatment preference of an individual patient and may also be helpful to detect patients' motives to choose one treatment over another.

Bossi, L. M., M. J. Ott, et al. (2008). "Reiki as a clinical intervention in oncology nursing practice." Clinical Journal of Oncology Nursing 12(3): 489-494.

Oncology nurses and their patients are frequently on the cutting edge of new therapies and interventions that support coping, health, and healing. Reiki is a practice that is requested with increasing frequency, is easy to learn, does not require expensive equipment, and in preliminary research, elicits a relaxation response and helps patients to feel more peaceful and experience less pain. Those who practice Reiki report that it supports them in self-care and a healthy lifestyle. This article will describe the process of Reiki, review current literature, present vignettes of patient responses to the intervention, and make recommendations for future study. [References: 37]

Boudreaux, E. D., E. L. O'Hea, et al. (2011). "Initial Development of the Mental Health Assessment and Dynamic Referral for Oncology (MHADRO)." Journal of Psychosocial Oncology 29(1): 83-102.

The Mental Health Assessment and Dynamic Referral for Oncology (MHADRO) is a program that conducts a computerized assessment of physical, psychological, and social functioning related to oncology treatment, prints personalized summary reports for both the patient and the provider, and for those who provide consent, faxes a referral and assessment summary report to a matched mental health treatment provider (i.e., dynamic referral). The functionality, feasibility, and end user satisfaction of the MHADRO were tested in a comprehensive care center. Of the 101 participants enrolled, 61 (60%) exhibited elevated distress on at least one of the mental health indices, and, of these, 12 (20%) chose a dynamic referral for mental health services. Patients and health care providers exhibited high levels of satisfaction with the program.

The MHADRO has potential for assisting in meeting the psychosocial needs faced by individuals with cancer and should be tested further for its facilitation of mental health treatment initiation.

Boyle, D. A. (2010). "The invisibility of nursing: implications from an analysis of National Cancer Institute-designated comprehensive cancer center web sites." Oncology Nursing Forum 37(2): E75-83.

PURPOSE/OBJECTIVES: To identify the degree of oncology nursing representation on public Web sites of the National Cancer Institute (NCI)-designated comprehensive cancer centers (CCCs) in the United States. DESIGN: Qualitative, descriptive. SETTING: Web sites. SAMPLE: 40 CCCs. METHODS: Using the Google search engine, a query was undertaken using the term National Cancer Institute-designated comprehensive cancer center. The search resulted in linkage to the site www.cancer.gov, which provided Web site addresses for 40 CCCs. The CCCs were classified into five categories based on the degree of nursing representation evident throughout each Web site. MAIN RESEARCH VARIABLES: Presence and quality of four themes in the Web site specific to oncology nursing activity at the CCC: (a) recognition of nursing on the CCC home page; (b) citations and/or descriptions of nursing personnel, programs, or recognitions within the Web site; (c) existence of a dedicated nursing Web page; and (d) acknowledgment of the chief nursing officer at the CCC. FINDINGS: Only 2 of the 40 CCCs revealed broad representation of oncology nursing throughout their Web site. Nearly 63% of CCC Web sites had no or minimal content about nursing. CONCLUSIONS: Public Web sites offer important information to patients with cancer, their families, and the general public. The absence of nursing in lay-oriented media devalues oncology nurses' highly specialized knowledge and skill. IMPLICATIONS FOR NURSING: Considerable opportunity exists to enhance the public's awareness of the scope and complexity of contemporary oncology nursing within the 40 CCCs in the United States. Omission of positive messages about nurses' work in hospital-related media misleads the public that nurses are not integral members of the multidisciplinary team. With the continued absence of both descriptive and results-oriented work quantification, oncology nurses will remain unable to communicate their worth to the public, nor take credit for their care.

Brauer, J. A., A. El Sehamy, et al. (2010). "Complementary and alternative medicine and supportive care at leading cancer centers: a systematic analysis of websites." Journal of Alternative & Complementary Medicine 16(2): 183-186.

BACKGROUND: With increasing frequency, patients with cancer and their family members are turning to the Internet to educate themselves about their disease and treatment options, including complementary and alternative medicine (CAM) and supportive care. However, very little is known about how national leading cancer centers represent these therapies via their websites. METHODS: Simulating the perspective of an information-seeking patient or family member, we performed a systematic analysis of the websites of 41 National Cancer Institute designated comprehensive cancer centers. Two researchers

independently evaluated websites, recorded CAM information, and rated quality of the websites using a 4-item Likert scale (overall, information, presentation, and navigation) with Cronbach's alpha = 0.97. Rating was adequately correlated between the two raters (correlation coefficient 0.8). RESULTS: Of 41 centers, 12 (29%) did not have functional websites with regard to information related to CAM. The most common CAM approaches mentioned were: acupuncture (59%), meditation/nutrition/spiritual support/yoga (56% for each), massage therapy (54%), and music therapy (51%). Twenty-three (23; 56%) presented information on support groups, 19 (46%) on patient seminars, 18 (44%) on survivorship effort, and 17 (41%) on symptom management clinics. Twenty-nine (29) (71%) of these websites had a telephone number available, 22 (54%) mentioned at least one ongoing research opportunity, and 19 (46%) provided links to the National Center for Complementary and Alternative Medicine website. Median rating of the quality of websites was 50 of 100, with only 7 (17%) of centers receiving a composite score 80 (excellent) or better. CONCLUSIONS: While a growing number of leading cancer centers provide information about CAM and supportive oncology information for patients via their websites, the quality and ease of navigation of these sites remain highly variable. Effective development and redesign of many of the websites is needed to better inform and empower patients and families seeking CAM and supportive care information.

Brecht, I. B., N. Graf, et al. (2009). "Networking for children and adolescents with very rare tumors: foundation of the GPOH Pediatric Rare Tumor Group." Klinische Padiatrie 221(3): 181-185.

In comparison to cancer in adults, virtually all cancers of childhood and adolescence are rare. Nevertheless, there is a rather ill-defined group of tumors that are not only exceptionally rare but also do not fall into the major clinical categories of childhood cancers. Thus, a substantial proportion of these exceptionally rare tumors are not registered within clinical registries or prospective therapy optimization studies. Only recently, major attention has been drawn to the diagnostic assessment and treatment of children and adolescents with such orphan diseases. In 2006, the RARE TUMOR GROUP has been established within the German Society of Pediatric Oncology and Hematology (GPOH). This working group includes experts from Pediatric Oncology, Pediatric Surgery, Pediatric Pathology, Medical, Dermatologic and Radiation Oncology as well as Pediatric Epidemiology. The major aim of the rare tumor group is to integrate these patients into the diagnostic and therapeutic network successfully established in the pediatric oncologic society. Thus, the group aims at fostering the exchange of experience in the treatment of rare tumors between medical centers and to include patients in the diagnostic and therapeutic reference network. In addition, an information platform shall be established that will be accessible to treating physicians, patients and their parents. More information and better registration shall be established by active data accrual on a regular basis and by the implementation of a data base including diagnostic and therapeutic data of patients with rare tumors. These efforts as presented in this article as well as an intensified international collaboration will allow us to provide

children and adolescents with rare tumors the best possible care.

Brown, R. F., C. L. Bylund, et al. (2009). "Identifying and responding to depression in adult cancer patients: evaluating the efficacy of a pilot communication skills training program for oncology nurses." Cancer Nursing 32(3): E1-7.

Depression is a common response among cancer patients to their diagnosis and treatment; however, it goes undetected by healthcare providers in about 50% of cases. Communication skills training has been suggested as means to help nurses detect and respond to patient depression. We developed and pilot tested a communication skills training workshop based around 6 strategies. The training program consisted of 2 half-day experiential workshops that included didactic teaching, exemplary video, and role play. The aim of the study was to evaluate the effectiveness of the communication skills training. Fifteen nurses were recruited from the ambulatory nursing service at (redacted). Standardized patient assessments were used to measure strategy uptake. The presence of each strategy was rated on a 4-point scale from "not attempted" to "successfully attempted." Nurses also completed evaluations of the training program. The nurses attempted 3 of 6 strategies more commonly after training, and a trend to significance was observed in a fourth strategy. The nurses reported more confidence to deal with patient depression and had greater self-efficacy. This short training program demonstrated success in improving nurse communication skills and confidence in dealing with patient depression. A larger trial of the training is planned.

Bugge, K. E., S. Helseth, et al. (2009). "Parents' experiences of a Family Support Program when a parent has incurable cancer." Journal of Clinical Nursing 18(24): 3480-3488.

AIMS AND OBJECTIVES: The Family Support Program was created to support children and parenting when one of the parents has incurable cancer. We chose a family-based approach to support parent's coping and to help families pull together, identify strengths in the family and learn how to seek help. BACKGROUND: Cancer is usually a new experience for young families. In most cases, parents do not have the necessary knowledge about their children's need for information and support about their parent's serious illness and impending death. DESIGN: A qualitative evaluation study based on data collected through in-depth interviews focusing on parent's experiences with the Family Support Program. METHODS: Participants were patients with incurable cancer and their partners and ex-partners with children aged between 5-18 years. Thirteen parents were in-depth interviewed. RESULTS: Parents described how the Family Support Program helped them gain greater insight into their children's thoughts and reactions and into how the situation affected their daily living. Parents reported that conflicts were reduced, they could talk more openly about the situation in the family and that they were shown how to support their children's coping. CONCLUSION: The Family Support Program met the parents in the study's needs for more information and support about how to cope with their children during the patient's terminal illness. RELEVANCE TO CLINICAL

PRACTICE: The Family Support Program is described in detail in a manual that makes it easy for other health workers to use the same programme. The Family Support program was in use in outpatient clinics, oncology wards and palliative care units and was provided both from nurses and social workers trained in cancer care. Parent's in the study would like the Family Support Program to be available to all patients who receive the poor prognosis that their cancer cannot be cured.

Buss, M. K., L. L. DuBenske, et al. (2008). "Patient/Caregiver influences for declining participation in supportive oncology trials." The Journal of Supportive Oncology 6(4): 168-174.

Enrolling adequate numbers of subjects to research projects that focus on the supportive needs of patients and caregivers is difficult, and this difficulty significantly impedes investigation of this important research area. We report reasons that patients or their informal caregivers declined to participate in one of two randomized, longitudinal clinical trials testing the Comprehensive Health Enhancement Support System (CHESS), a Web-based information and support scheme for people with advanced cancer and their primary informal caregivers. Patients were asked why they declined participation in these trials; their responses then were recorded and coded into themes. The leading reasons included factors related to using a computer (eg, lack of familiarity with using this technology, access to other resources), being attended to by a caregiver (eg, poor caregiver health, caregiver burden, patient doing well and not needing a caregiver), taking part in a study (eg, survey burden, privacy concerns, wording of the consent form), dealing with personal issues (eg, time commitment, timing of study, feelings of being overwhelmed, and coping styles), and lack of interest. By using eligibility criteria that largely parallel those for studies of chemotherapeutic regimens, this research project highlighted reasons why subjects decline participation in clinical trials. This information was specific to supportive care trials; it may help researchers plan recruitment strategies and enrollment targets.

Bydder, S., L. Bloomfield, et al. (2008). "Ontario radiation oncology residents needs in first postgraduate year-residents perspective survey: in regards to Szumacher et al. (IntJ Radiat Oncol Biol Phys 2007;69:512-517)." International Journal of Radiation Oncology, Biology, Physics 70(3): 963-964.

Bylund, C. L., R. Brown, et al. "The implementation and assessment of a comprehensive communication skills training curriculum for oncologists." Psycho-Oncology 19(6): 583-593.

OBJECTIVE: The objective of this paper is to report the implementation and assessment of the Comskil Training Curriculum at Memorial Sloan-Kettering Cancer Center. METHOD: Twenty-eight attending physicians and surgeons participated in communication skills training modules as part of a train-the-trainer program. Doctors were video recorded in clinical consultations with patients two times before training and two times after training, resulting in 112 video

recordings for analysis. Recordings were coded using the Comskil Coding System. RESULTS: Communication skills related to two of the six major skill sets, Establishing the Consultation Framework and Checking, increased following training. Limited changes emerged in three skill sets, while one skill set, Shared Decision Making, did not change. Doctors who attended more training modules had higher levels of change. Female participants demonstrated three skills more frequently than males post-training. CONCLUSIONS: The intervention produced significant communication skills uptake in a group of experienced attending clinicians, mediated by the amount of training. Future research should focus on the dose of training necessary to achieve skills uptake and the effect of skills training on patient outcomes. (c) 2009 John Wiley & Sons, Ltd.

Bylund, C. L., R. F. Brown, et al. (2008). "Training faculty to facilitate communication skills training: development and evaluation of a workshop." Patient Education & Counseling 70(3): 430-436.

OBJECTIVE: To develop a workshop for training faculty to facilitate small group role play sessions for a communication skills training program and assess the impact of that workshop on the trainees' self-efficacy about facilitation skills. METHODS: A multi-specialty group of 33 attending physicians at a Comprehensive Cancer Center were trained in a Facilitating Communication Skills Training workshop in order to prepare them to facilitate small group role play with fellows and residents. The workshop curriculum was based on theory and literature on teaching communication skills. RESULTS: The workshop had a significant effect on participants' self-efficacy in facilitating communication skills training. At least 75% of participants reported feeling comfortable facilitating communication skills training small groups. CONCLUSION: This facilitation workshop was successful in providing participants with confidence to successfully facilitate small group role play sessions in communication skills training. PRACTICE IMPLICATIONS: In order to evaluate the effectiveness of communication skills training programs, it is important to have trained facilitators who adhere to a set of facilitation guidelines. Workshops on facilitation skills provide the background and practice time necessary as a first step in the training process.

Caliskan Yilmaz, M., S. A. Ozsoy, et al. "Effectiveness of a discharge-planning program and home visits for meeting the physical care needs of children with cancer." Supportive Care in Cancer 18(2): 243-253.

GOALS OF WORK: The purpose of this study was to investigate the effectiveness of a discharge-planning program on helping caregivers meet the physical care needs of children with cancer. PATIENTS AND METHODS: This research is a quasi-experimental type of study in a pediatric oncology clinic at a university hospital in Izmir/Turkey. The control group had 25 and the experimental group had 24 patients with their caregivers. For the experimental group, discharge planning, discharge teaching, home visits, and telephone consultation were provided and has been planned to investigate the effectiveness of a discharge-planning program on helping caregivers meet the

physical care needs of children with cancer between 0-18 years of age. MAIN RESULTS: In the third assessment, the number of patients that needed physical care needs in the experimental and control groups was decreased, and children in the experimental group had a lower number of physical care needs. A decreased number of unplanned admissions to the hospital at the first and third follow-up times, a decrease in unplanned admissions, and higher satisfaction rate were seen in the experimental group caregivers. CONCLUSIONS: A discharge-planning program and a hospital-based home care model had a very significant effect on the care needs of children with cancer and their caregivers. Our findings indicate that a discharge-planning program and a hospital-based home care model had a very significant effect on the care needs of children with cancer and their caregivers.

Calvert, M. J., J. R. Skelton, et al. (2008). "The need for education on health related-quality of life." BMC Medical Education 8: 2.

BACKGROUND: Health-related quality of life is increasingly recognised as an important outcome measure that complements existing measures of clinical effectiveness. The education available on this subject for different healthcare professionals is varied. This article describes the design, implementation and evaluation of a Special Study Module on Health-Related Quality of Life for undergraduate medical students at the University of Birmingham. METHODS: The course involves 10 hours of "guided discovery learning" covering core concepts of Health-Related Quality of Life assessment including methodological considerations, use in clinical trials, routine practice and in health policy followed by self-directed learning. The taught components aim to provide students with the skills and knowledge to enable them to explore and evaluate the use of quality of life assessments in a particular patient group, or setting, through self-directed learning supported by tutorials. RESULTS: The use of case studies, recent publications and research, and discussion with a research oncology nurse in task-based learning appeared to provide students with a stimulating environment in which to develop their ideas and was reflected in the diverse range of subjects chosen by students for self-directed study and the positive feedback on the module. Course evaluation and student assessment suggests that quality of life education appears to integrate well within the medical curriculum and allows students to develop and utilise skills of time-management and independent, self-directed learning that can be applied in any context. CONCLUSION: We suggest that education and training initiatives in quality of life may improve the quality of studies, and help bridge the gap between research and clinical practice. Resources for curriculum development on health-related quality of life have been developed by the International Society for Quality of Life Research and may prove a useful tool to educators interested in this area.

Campbell, C., J. Craig, et al. "Implementing and measuring the impact of patient navigation at a comprehensive community cancer center." Oncology Nursing Forum 37(1): 61-68.

PURPOSE/OBJECTIVES: To determine whether patient navigation in a

comprehensive community cancer center affects patient and staff perceptions of patient preparation for treatment, access to care, and overall satisfaction. DESIGN: Program evaluation with patient and staff surveys. SETTING: Comprehensive community cancer center accredited by the American College of Surgeons in the southeastern United States with 1,037 analytic cases of cancer in 2007; population of the main county served is about 177,963. SAMPLE: 48 patients (28 navigator and 20 non-navigator) and 26 employees, including physicians, nurses, and other support staff. METHODS: A 10-item survey with Likert scale format was sent to a stratified sample of 100 newly diagnosed patients with cancer. A five-item survey with the same format was sent to 40 staff working with the patients. MAIN RESEARCH VARIABLE: Patient navigation. FINDINGS: Patients who received navigation services responded more positively to survey statements. Statistical significance ($p > 0.05$) was identified in 7 of 10 statements when patient groups were compared. Provider responses indicated agreement with all five statements included in the survey. CONCLUSIONS: Patients with cancer and oncology staff reported that patient navigation is effective in increasing patient satisfaction and decreasing barriers to care. IMPLICATIONS FOR NURSING: Patient navigation is an emerging trend in cancer care. Patient navigators can play a significant role in assisting patients with coordinating services across the continuum of care. Continued research is essential in refining the role and eminence of patient navigators.

Cardoso, M. J., A. Magalhaes, et al. (2008). "Is face-only photographic view enough for the aesthetic evaluation of breast cancer conservative treatment?" Breast Cancer Research & Treatment 112(3): 565-568.

The breast cancer conservative treatment. cosmetic results (BCCT.core) is a new software tool created for the automatic and objective evaluation of the aesthetic result of BCCT. It makes use of a face-only photographic view of each patient and might thus have been considered insufficient for an accurate evaluation, as others have used multiple views of each patient. The purpose of this work is to compare the performance of the BCCT.core (using face-only views) with a subjective expert analysis using both the face-only and four-view assessment. Photographs in four-views of 150 patients, were evaluated by a panel of experts and a consensus classification was obtained. The agreement between the consensus and the BCCT.core (face-only view) was calculated using the kappa (k) and weighted kappa (wk) statistics. Face-only views, of the same 150 patients, were subsequently sorted out in a different order and sent for individual evaluation by three specialists from the previous panel of experts. The individual agreement between the face-only view and the four-view evaluation by each of the three experts and the consensus was calculated using the same methods. Obtained results were compared to the BCCT.core performance. The software obtained a moderate agreement with the consensus ($k = 0.57$; $wk = 0.68$). The highest value of agreement, from the three experts, between the four-view evaluation and the consensus was identical to the software agreement ($k = 0.55$; $wk = 0.67$). In the face-only view experiment, the highest value of agreement between the experts and the consensus was only fair ($k = 0.37$; wk =

0.54). Performance of the software was thus considered equal to that obtained by experts using a four-view evaluation.

Carpenter, J. S., S. Rawl, et al. (2008). "Oncology outpatient and provider responses to a computerized symptom assessment system." Oncology Nursing Forum 35(4): 661-669.

PURPOSE/OBJECTIVES: To assess patient and provider responses to a computerized symptom assessment system. DESIGN: Descriptive, longitudinal study with retrospective, longitudinal medical records review. SETTING: University-based National Cancer Institute-designated outpatient cancer center. SAMPLE: 80 oncology outpatients receiving chemotherapy, 8 providers, and 30 medical records. METHODS: Patients completed the computerized assessment during three chemotherapy follow-up clinic appointments (times 1, 2, and 3). Patient usability was recorded via an observer checklist (ease of use) and the computer (completion time). Patient satisfaction and impact were assessed during telephone interviews two to three days after times 1 and 3 only. Provider usability and impact were assessed at the end of the study using a questionnaire and focus groups, whereas effect on provider documentation was assessed through chart audits. MAIN RESEARCH VARIABLES: Patient usability (ease of use, completion time), satisfaction, and impact; provider usability and impact. FINDINGS: Patients reported good usability, high satisfaction, and modest impact on discussions with their providers. Providers reported modest usability, modest impact on discussions with patients, and had varied reactions as to how the system affected practice. Documentation of symptoms was largely absent before and after implementation. CONCLUSIONS: This system demonstrated good usability and satisfaction but had only a modest impact on symptom-related discussions and no impact on documentation. IMPLICATIONS FOR NURSING: A computerized system can help address barriers to symptom assessment but may not improve documentation unless it can be integrated into existing medical records systems.

Carroll, J. K., S. G. Humiston, et al. (2010). "Patients' experiences with navigation for cancer care." Patient Education & Counseling 80(2): 241-247.

OBJECTIVE: We examined how navigation, defined as the assessment and alleviation of barriers to adequate health care, influences patients' perspectives on the quality of their cancer care. METHODS: We conducted post-study patient interviews from a randomized controlled trial (usual care vs. patient navigation services) from cancer diagnosis through treatment completion. Patients were recruited from 11 primary care, hospital and community oncology practices in New York. We interviewed patients about their expectations and experience of patient navigation or, for non-navigated patients, other sources of assistance. RESULTS: Thirty-five patients newly diagnosed with breast or colorectal cancer. Valued aspects of navigation included emotional support, assistance with information needs and problem-solving, and logistical coordination of cancer care. Unmet cancer care needs expressed by patients randomized to usual care consisted of lack of assistance or support with childcare, household

responsibilities, coordination of care, and emotional support. CONCLUSION: Cancer patients value navigation. Instrumental benefits were the most important expectations for navigation from navigated and non-navigated patients. Navigated patients received emotional support and assistance with information needs, problem-solving, and logistical aspects of cancer care coordination. PRACTICE IMPLICATIONS: Navigation services may help improve cancer care outcomes important to patients by addressing fragmented, confusing, uncoordinated, or inefficient care. Copyright 2009 Elsevier Ireland Ltd. All rights reserved.

Casado, F. J., S. Garcia-Pareja, et al. (2010). "Dosimetric characterization of an 192Ir brachytherapy source with the Monte Carlo code PENELOPE." Physica Medica 26(3): 132-139.

Monte Carlo calculations are highly spread and settled practice to calculate brachytherapy sources dosimetric parameters. In this study, recommendations of the AAPM TG-43U1 report have been followed to characterize the Varisource VS2000 (192)Ir high dose rate source, provided by Varian Oncology Systems. In order to obtain dosimetric parameters for this source, Monte Carlo calculations with PENELOPE code have been carried out. TG-43 formalism parameters have been presented, i.e., air kerma strength, dose rate constant, radial dose function and anisotropy function. Besides, a 2D Cartesian coordinates dose rate in water table has been calculated. These quantities are compared to this source reference data, finding results in good agreement with them. The data in the present study complement published data in the next aspects: (i) TG-43U1 recommendations are followed regarding to phantom ambient conditions and to uncertainty analysis, including statistical (type A) and systematic (type B) contributions; (ii) PENELOPE code is benchmarked for this source; (iii) Monte Carlo calculation methodology differs from that usually published in the way to estimate absorbed dose, leaving out the track-length estimator; (iv) the results of the present work comply with the most recent AAPM and ESTRO physics committee recommendations about Monte Carlo techniques, in regards to dose rate uncertainty values and established differences between our results and reference data. The results stated in this paper provide a complete parameter collection, which can be used for dosimetric calculations as well as a means of comparison with other datasets from this source.

Charlesworth, P. J., N. Kilbey, et al. (2010). "Automated uro-oncology data collection: the Cancer Research Uro-Oncology Database." BJU International 105(12): 1663-1666.

OBJECTIVE: To develop a relational database (Cancer Research Uro-Oncology Database, CRUD) to enable automatic data collection on all urological malignancies within our region, as there is increasing emphasis on good data collection for surgical patients with cancer, and numerous overlapping systems that are amassing data on the same patients. METHODS: Links have been established between pathological databases, multidisciplinary team data-collection systems and patient-survival monitoring facilities, providing accurate pathology, treatment and survival data on all of uro-oncology patients. We are

also developing individual modules for the oncological surgeons within our unit that are compatible with the British Association of Urological Surgeons (Section of Oncology), and have plans to connect to the Medical and Clinical Oncology data systems in the future. RESULTS: Pre-existing protocols for fresh tissue, plasma and urine collection have been incorporated within CRUD via a tissue-tracking system, to comply with the Human Tissue Act 2004, and link these samples to accurate clinical, pathological and survival data. Many research and audit projects have already used these data, including the construction of a 274-case tissue microarray for renal cell carcinoma, microRNA hybridization arrays and analysis of 900 nephrectomy cases from the past three decades. CONCLUSIONS: Our work over the past 3 years in Oxford has established numerous links with organizations collecting data on our uro-oncological patients, and we are now able to collect this excellent combined data on all of these patients, in an automated manner.

Cheville, A. L., L. A. Beck, et al. (2009). "The detection and treatment of cancer-related functional problems in an outpatient setting." Supportive Care in Cancer 17(1): 61-67.

GOALS OF WORK: Cancer causes functional problems that are often neither detected nor treated in the outpatient setting. Patient-physician communication regarding functional issues may contribute. This study was conducted to quantify the degree of concordance between patient-identified functional problems and their documentation in the oncology-generated medical record. MATERIALS AND METHODS: We administered a 27-item questionnaire addressing cancer-related symptoms, signs, and functional problems to a consecutive sample of 244 patients undergoing outpatient cancer treatment. Oncology clinician-generated notation in the electronic medical record (EMR) was systematically reviewed for documentation of the instrument items. EMR review began the day of instrument completion and extended retrospectively for 6 months. MAIN RESULTS: Eighty-three percent (202) completed the survey with at least one cancer-related symptom, sign, or functional problem identified by 71.8%, 33.2% and 65.8% of patients, respectively. Difficulty with ambulation (23.9%) and balance (19.4%) were the most frequent functional problems. Clinician notes referred to 49% of patients' symptoms, but only 37% of their signs and 6% of their functional problems. Pain, weight loss, and nausea (ORs > 4.9, $p < 0.004$) were most likely to be documented while functional problems (OR 0.2, $p < 0.0001$) were the least likely to be noted. Two rehabilitation physician referrals were generated for pain and limb swelling, but no functional problems were formally addressed. CONCLUSION: Functional problems are prevalent among outpatients with cancer and are rarely documented by oncology clinicians. A more aggressive search for, and treatment of, these problems may be beneficial for outpatients with cancer.

Chino, J. P., W. R. Lee, et al. (2011). "Teaching the anatomy of oncology: evaluating the impact of a dedicated oncoanatomy course." International Journal of Radiation Oncology, Biology, Physics 79(3): 853-859.

PURPOSE: Anatomic considerations are often critical in multidisciplinary cancer

care. We developed an anatomy-focused educational program for radiation oncology residents integrating cadaver dissection into the didactic review of diagnostic, surgical, radiologic, and treatment planning, and herein assess its efficacy. METHODS AND MATERIALS: Monthly, anatomic-site based educational modules were designed and implemented during the 2008-2009 academic year at Duke University Medical Center. Ten radiation oncology residents participated in these modules consisting of a 1-hour didactic introduction followed by a 1-hour session in the gross anatomy lab with cadavers prepared by trained anatomists. Pretests and posttests were given for six modules, and post-module feedback surveys were distributed. Additional review questions testing knowledge from prior sessions were integrated into the later testing to evaluate knowledge retention. Paired analyses of pretests and postests were performed by Wilcoxon signed-rank test. RESULTS: Ninety tests were collected and scored with 35 evaluable pretest and posttest pairs for six site-specific sessions. Posttests had significantly higher scores (median percentage correct 66% vs. 85%, p<0.001). Of 47 evaluable paired pretest and review questions given 1-3 months after the intervention, correct responses rates were significantly higher for the later (59% vs. 86%, p=0.008). Resident course satisfaction was high, with a median rating of 9 of 10 (IQR 8-9); with 1 being "less effective than most educational interventions" and 10 being "more effective than most educational interventions." CONCLUSIONS: An integrated oncoanatomy course is associated with improved scores on post-intervention tests, sustained knowledge retention, and high resident satisfaction. Copyright Copyright 2011 Elsevier Inc. All rights reserved.

Chow, J. C. and G. N. Grigorov (2008). "Monte Carlo simulation of backscatter from lead for clinical electron beams using EGSnrc." Medical Physics 35(4): 1241-1250.

In electron radiotherapy of superficial lesions in the eyelid, lip, buccal mucosa, ear, and nose, backscattered electrons are produced from the lead shield used to protect the critical tissue underneath the tumor. In this study, the backscattered electrons, produced by clinical electron beams using a Varian 21 EX linear accelerator, were studied using Monte Carlo simulations. The electron backscatter factor (EBF), defined as the ratio of dose at the tissue-lead interface to the dose at the same point without the presence of backscatter, was calculated using the Monte Carlo EGSnrc-based code. The calculated EBFs were verified with measurements using metal-oxide-semiconductor field effect transistor detectors. The effect of the (1) initial electron beam energy, (2) thickness of bolus over the lead shield, (3) beam's angle of incidence, and (4) presence of an aluminum sheet used to absorb backscattered electrons, on the EBF, were studied. It is found that for lead shielding positioned at any fixed depth, the EBF decreases with an increase in initial electron beam energy (4-16 MeV). In addition, for depths within the electron practical range, Rp, and at a particular beam energy, the EBF increases with depth (or thickness of the treatment volume). When the electron beam angle increases from 0 degrees to 5 degrees, the EBF only decreases slightly (<4%) for all energies. The influence of the beam obliquity on the EBF is important when the treatment surface is not flat

and perpendicular to the central beam axis. The use of an aluminum sheet to reduce backscattered electrons was also investigated. For a relatively low electron beam energy (4 MeV), a 2 mm aluminum sheet can reduce backscattering by 31%. While the electron beam energy increased, less backscattered electrons were produced and therefore removed by the same thickness of aluminum (only about 6% for 16 MeV). The Monte Carlo calculated EBFs from this study, characterized by the electron beam energy, depth of bolus above the lead shield, beam obliquity, and presence of an aluminum sheet, may provide important clinical information for radiation oncology staff when considering the effect of electron backscatter on radiotherapy using internal shielding.

Coakley, A. B. and C. A. Ghiloni (2009). "A fellowship program preparing students for employment as new graduate nurses in oncology nursing." Creative Nursing 15(1): 46-52.

The Carol A. Ghiloni Oncology Fellowship Program (OFP), developed in 2001, provides an opportunity for student nurses between their junior and senior years in a baccalaureate program to learn about the role that nurses play in providing care to patients with cancer. To explore whether former fellows felt prepared for employment in oncology nursing after their fellowship experience, a focus group discussion with former student nurse oncology fellows was conducted. The discussion was audiotaped and transcribed. Content analysis of the transcripts revealed four key findings: OFP provides an opportunity to make informed career choices; OFP provides confidence-building experience; OFP provides an experience of preceptor role modeling; and OFP provides an opportunity to build relationships with staff, patients, and patients' families.

Collichio, F. A., M. P. Kosty, et al. (2010). "How to organize a fellowship program: lessons learned and how to include accreditation council for graduate medical education competencies in the curriculum." Journal of Clinical Oncology 28(22): 3659-3667.

Corovic, S., J. Bester, et al. (2009). "An e-learning application on electrochemotherapy." Biomedical Engineering Online 8: 26.

BACKGROUND: Electrochemotherapy is an effective approach in local tumour treatment employing locally applied high-voltage electric pulses in combination with chemotherapeutic drugs. In planning and performing electrochemotherapy a multidisciplinary expertise is required and collaboration, knowledge and experience exchange among the experts from different scientific fields such as medicine, biology and biomedical engineering is needed. The objective of this study was to develop an e-learning application in order to provide the educational content on electrochemotherapy and its underlying principles and to support collaboration, knowledge and experience exchange among the experts involved in the research and clinics. METHODS: The educational content on electrochemotherapy and cell and tissue electroporation was based on previously published studies from molecular dynamics, lipid bilayers, single cell level and simplified tissue models to complex biological tissues and research and

clinical results of electrochemotherapy treatment. We used computer graphics such as model-based visualization (i.e. 3D numerical modelling using finite element method) and 3D computer animations and graphical illustrations to facilitate the representation of complex biological and physical aspects in electrochemotherapy. The e-learning application is integrated into an interactive e-learning environment developed at our institution, enabling collaboration and knowledge exchange among the users. We evaluated the designed e-learning application at the International Scientific workshop and postgraduate course (Electroporation Based Technologies and Treatments). The evaluation was carried out by testing the pedagogical efficiency of the presented educational content and by performing the usability study of the application. RESULTS: The e-learning content presents three different levels of knowledge on cell and tissue electroporation. In the first part of the e-learning application we explain basic principles of electroporation process. The second part provides educational content about importance of modelling and visualization of local electric field in electroporation-based treatments. In the third part we developed an interactive module for visualization of local electric field distribution in 3D tissue models of cutaneous tumors for different parameters such as voltage applied, distance between electrodes, electrode dimension and shape, tissue geometry and electric conductivity. The pedagogical efficiency assessment showed that the participants improved their level of knowledge. The results of usability evaluation revealed that participants found the application simple to learn, use and navigate. The participants also found the information provided by the application easy to understand. CONCLUSION: The e-learning application we present in this article provides educational material on electrochemotherapy and its underlying principles such as cell and tissue electroporation. The e-learning application is developed to provide an interactive educational content in order to simulate the "hands-on" learning approach about the parameters being important for successful therapy. The e-learning application together with the interactive e-learning environment is available to the users to provide collaborative and flexible learning in order to facilitate knowledge exchange among the experts from different scientific fields that are involved in electrochemotherapy. The modular structure of the application allows for upgrade with new educational content collected from the clinics and research, and can be easily adapted to serve as a collaborative e-learning tool also in other electroporation-based treatments such as gene electrotransfer, gene vaccination, irreversible tissue ablation and transdermal gene and drug delivery. The presented e-learning application provides an easy and rapid approach for information, knowledge and experience exchange among the experts from different scientific fields, which can facilitate development and optimisation of electroporation-based treatments.

Costa, J. (2008). "Systems medicine in oncology." Nature Clinical Practice Oncology 5(3): 117.

Coutsouvelis, J., C. E. Corallo, et al. (2010). "Implementation of a pharmacist-initiated pharmaceutical handover for oncology and haematology patients being transferred to

critical care units." Supportive Care in Cancer 18(7): 811-816.

GOALS OF WORK: An information gap with respect to specific therapies was identified when patients were transferred from the oncology and haematology unit (OHU) to the critical care units. The goal was to implement and evaluate the effectiveness of a pharmacist-initiated pharmaceutical handover (PIPH) for patients being transferred from the OHU to the critical care units at a major teaching hospital. PATIENTS AND METHODS: A PIPH process for the specific therapies of mouthcare, chemotherapy regimen, growth factors and antibiotics was developed. The PIPH was delivered in written format or combined written and verbal format. The impact of the PIPH was by assessment of recorded clinical pharmacist interventions. Data were analysed to evaluate any difference in the number of interventions relating to and the time to administration of the specific therapies. MAIN RESULTS: Data were available for 30 patient transfers in the pre-implementation group, with 22 transfers available in the post-implementation period. The number of interventions relating to the specific therapies was significantly reduced in the post-implementation group (144 vs 26; $p < 0.0001$). A significantly greater proportion of the specific therapies were administered on time in the post-implementation group (57% vs 96%; $p < 0.0001$). CONCLUSIONS: Clinical pharmacists in the specialty area of oncology and haematology can improve the continuum of care when their patients are transferred to other units. By providing an accurate handover about specific therapies, there is an overall improvement in the prescribing and timely administration of these therapies.

Craig, K. and A. Flaherty-Quemere (2009). "Implementing an automated acuity tool for scoring case management cases and caseloads at Blue Cross Blue Shield of Massachusetts." Professional Case Management 14(4): 185-191.

PURPOSE/OBJECTIVES: Blue Cross Blue Shield of Massachusetts (BCBSMA) required a statistically validated tool to understand the acuity of its case management (CM) populations. The BCBSMA management sought reliable methods to quantify the weights of case managers' caseloads, allow associates and managers to have conversations about workloads based on objective measurable data, and analyze the data to ensure that the correct populations are being targeted for CM. PRIMARY PRACTICE SETTING(S): The tools, techniques, and strategies described in the Acuity and eQuity Workflow Solutions are suitable for all healthcare practice settings. Acuity scoring metrics are designed especially for CM settings such as independent stand-alone companies, inpatient and outpatient practices, and multistrata health plans and hospital consortia. FINDINGS/CONCLUSIONS: The customized BluCuity assessment tool, tested in the interrater reliability (IRR) study arm of the project, was validated to a high degree of concordance in BluCuity scoring among CM raters with an overall agreement of 82% (20 novel raters, 20 cases, 190 rater pairs, 3,800 pairwise case reviews; $p = .03$). The BluCuity tool and workflow strategies were implemented into the BCBSMA information technology (IT) system for oncology and other CM teams in 2008. Report data demonstrated the acuities of case managers' cases, the relative case and caseload weights among

a team of case managers, and the differences in cases and caseloads across CM product offerings. IMPLICATIONS FOR CASE MANAGEMENT PRACTICE: Acuity-based tools such as BluCuity to access the severity, intensity, and complexity of CM cases operationalize quality assessments into quantifiable data. Acuity score reports can join other accounting and operational reports to determine appropriate caseloads, case assignments, and staffing. To assess consistency of judgment among case managers, CM organizations can implement a formal IRR testing methodology to evaluate the level of clinical assessment reliability and establish training protocols. The automated IT acuity assessment system and data outputs can be used to assess the overall weight of a caseload based on diagnosis code groupings such as oncology, pediatric, transplants, and stroke, and illustrate the intensity of services required by CM clients at different times or in different programs. Organizations that sell CM services can use the ability to score the acuity of CM cases to scale and justify the pricing of their services.

Crisafulli, T. (2009). "The business of oncology 2010: an electronic view." Seminars in Oncology 36(6): 491-492.

Crisafulli, T. (2009). "Tommorrow's agenda: the business of oncology." Seminars in Oncology 36(5): 373-374.

Croager, E. J., T. Eades, et al. (2010). "Impact of a short, culturally relevant training course on cancer knowledge and confidence in Western Australia's Aboriginal Health Professionals." Australian & New Zealand Journal of Public Health 34 Suppl 1: S76-79.

OBJECTIVE: To develop, deliver and evaluate a cancer education course for Indigenous Health Professionals. METHOD: The cancer education course combines expert presentations, interactive sessions and visits to local cancer treatment centres. Three four-day courses have been run, in both metropolitan and regional Western Australia (WA). Cancer knowledge and confidence were measured at baseline, course completion and at follow-up (six to eight months). Data were analysed within subject. RESULTS: Thirty-five Aboriginal Health Professionals have completed the program, most from rural or remote WA. All confidence items significantly improved at course completion ($p<0.005$), but improvements for only two items, 'I know what cancer is' and 'I can describe the different common cancers', were sustained at follow-up ($p<0.05$). Knowledge of treatment ($p<0.05$), screening ($p<0.05$) and the most common cancers in women ($p<0.005$) were significantly greater after course completion, but increased knowledge was not sustained at follow-up. CONCLUSION: Demand for places suggests that Aboriginal Health Professionals are interested in developing knowledge, skills and confidence in cancer control. Attendance increased understanding of cancer and improved cancer knowledge however this was not maintained. Implications: A short, culturally relevant training course increases cancer knowledge and confidence, however, ongoing education is needed to maintain this.

Cui, J. F., Y. K. Liu, et al. (2008). "Screening serum hepatocellular carcinoma-associated proteins by SELDI-based protein spectrum analysis." World Journal of Gastroenterology 14(8): 1257-1262.

AIM: To find out potential serum hepatocellular carcinoma (HCC)-associated proteins with low molecular weight and low abundance by SELDI-based serum protein spectra analysis, that will have much application in the diagnosis or differentiated diagnosis of HCC, as well as giving a better understanding of the mechanism of hepato-carcinogenesis. METHODS: Total serum samples were collected with informed consent from 81 HCC patients with HBV(+)/cirrhosis(+), 36 cirrhosis patients and 43 chronic hepatitis B patients. Serum protein fingerprint profiles were first generated by selected WCX2 protein chip capture integrating with SELDI-TOF-MS, then normalized and aligned by Ciphergen SELDI Software 3.1.1 with Biomarker Wizard. Comparative analysis of the intensity of corresponding protein fingerprint peaks in normalized protein spectra, some protein peaks with significant difference between HCC and cirrhosis or chronic hepatitis B were found. RESULTS: One hundred and twenty-eight serum protein peaks between 2000 and 30000 Da were identified under the condition of signal-to-noise > 5 and minimum threshold for cluster > 20%. Eighty-seven of these proteins were showed significant differences in intensity between HCC and cirrhosis ($P < 0.05$). Of the above differential proteins, 45 proteins had changes greater than two-fold, including 15 upregulated proteins and 30 downregulated proteins in HCC serum. Between HCC and chronic hepatitis B, 9 of 52 differential proteins ($P < 0.05$) had intensities of more than two-fold, including 2 upregulated proteins and 7 downregulated proteins in HCC serum. Between cirrhosis and chronic hepatitis B, 28 of 79 significant differential proteins ($P < 0.05$) changes greater than two-fold in intensity, including 17 upregulated proteins and 11 downregulated proteins in cirrhosis serum. For the analysis of these leading differential proteins in subtraction difference mode among three diseases, the five common downregulated proteins in HCC serum (M/Z 2870, 3941, 2688, 3165, 5483) and two common upregulated proteins (M/Z 3588, 2017) in HCC and cirrhosis serum were screened. CONCLUSION: Because the interference of unspecific secreted proteins from hepatitis B and cirrhosis could be eliminated partly in HCC serum under subtraction difference analysis, these seven common differential proteins have the obvious advantage of specificity for evaluating the pathological state of HCC and might become novel candidate biomarkers in the diagnosis of HCC.

Cunningham, J., M. Coffey, et al. (2010). "Radiation Oncology Safety Information System (ROSIS)--profiles of participants and the first 1074 incident reports." Radiotherapy & Oncology 97(3): 601-607.

BACKGROUND AND PURPOSE: The Radiation Oncology Safety Information System (ROSIS) was established in 2001. The aim of ROSIS is to collate and share information on incidents and near-incidents in radiotherapy, and to learn from these incidents in the context of departmental infrastructure and procedures. MATERIALS AND METHODS: A voluntary web-based cross-organisational and international reporting and learning system was developed (cf.

the www.rosis.info website). Data is collected via online Department Description and Incident Report Forms. A total of 101 departments, and 1074 incident reports are reviewed. RESULTS: The ROSIS departments represent about 150,000 patients, 343 megavoltage (MV) units, and 114 brachytherapy units. On average, there are 437 patients per MV unit, 281 per radiation oncologist, 387 per physicist and 353 per radiation therapy technologist (RT/RTT). Only 14 departments have a completely networked system of electronic data transfer, while 10 departments have no electronic data transfer. On average seven quality assurance (QA) or quality control (QC) methods are used at each department. A total of 1074 ROSIS reports are analysed; 97.7% relate to external beam radiation treatment and 50% resulted in incorrect irradiation. Many incidents arise during pre-treatment but are not detected until later in the treatment process. Where an incident is not detected prior to treatment, an average of 22% of the prescribed treatment fractions were delivered incorrectly. The most commonly reported detection methods were "found at time of patient treatment" and during "chart-check". CONCLUSION: While the majority of the incidents that reported to this international cross-organisational reporting system are of minor dosimetric consequence, they affect on average more than 20% of the patient's treatment fractions. Nonetheless, defence-in-depth is apparent in departments registered with ROSIS. This indicates a need for further evaluation of the effectiveness of quality controls. Copyright Copyright 2010. Published by Elsevier Ireland Ltd.

DaJusta, D. G., T. J. Mueller, et al. (2008). "Accreditation Council for Graduate Medical Education competency-based on-line computer course in pediatric oncology for urology residents." Urology 71(5): 818-820.

OBJECTIVE: To develop an on-line course in pediatric urology for our urology residents, to expose residents to required pediatric urology content within the confines of an 80-hour work week. METHODS: An on-line, Accreditation Council for Graduate Medical Education competency-based course in pediatric urology was designed using a commercially based platform. RESULTS: The computer-based teaching course was flexible and provided virtually limitless opportunities for course design, structure, and content. CONCLUSIONS: Computer-based teaching platforms may be a useful alternative teaching method to facilitate urology resident education within the confines of an 80-hour work week.

Dalah, E. Z., A. Nisbet, et al. (2008). "Evaluating commercial image registration packages for radiotherapy treatment planning." Applied Radiation & Isotopes 66(12): 1948-1953.

Multi-modality imaging is involved in almost all oncology applications from diagnosis through treatment planning and follow-up. Commercial image fusion software packages are becoming available but require comprehensive evaluation to ensure reliability of fusion and the underpinning registration algorithm. This is especially critical for target volume delineation in radiotherapy. The present work seeks to assess such accuracy for a number of available registration methods. A National Electrical Manufacturers Association (NEMA) body phantom was used in evaluating computer tomography (CT), magnetic resonance (MR) and PET

images. In addition, discussion is provided concerning the choice and geometry of fiducial markers in phantom studies and the effect of window level on target size, in particular in regard to the application of multimodality imaging in treatment planning. In general, the accuracy of fusion of multi-modality images was within 0.5-1.5mm of actual feature diameters and <2 ml volume of actual values, particularly in CT images.

Daly, B. J. (2010). "Introduction: Interview with Barbara J. Daly, RN, PhD, FAAN, Gertrude Perkins Oliva Professor of Oncology Nursing, Case Western Reserve University, and Director, Clinical Ethics, University Hospitals Case Medical Center. Interviewed by Clareen Wiencek." AACN Advanced Critical Care 21(1): 41-43.

Davis, K. M., J. S. Lai, et al. (2008). "Conducting routine fatigue assessments for use in clinical oncology practice: patient and provider perspectives." Supportive Care in Cancer 16(4): 379-386.

GOALS OF WORK: Fatigue is the most common symptom associated with cancer and its treatment. The present study measured patient and provider perceptions of the feasibility and acceptability of conducting computerized fatigue assessments during routine follow-up outpatient clinic visits. MATERIALS AND METHODS: A subset of 64 patients from a larger study, testing items for inclusion in a fatigue item bank, completed two computerized fatigue assessments at 2- to 3-month intervals. After the second assessment, patients completed a questionnaire about the usefulness of the assessments and the understandability of graphic reports depicting the fatigue scores. They were also asked about the optimal frequency for conducting fatigue assessments. Providers were asked similar feasibility questions. MAIN RESULTS: Providers thought displays of fatigue scores would be more useful than patients did. Patients and providers also differed on the frequency with which fatigue assessments should be conducted. Interestingly, of the 37% of patients who reported that assessments should be conducted at a different frequency than the choices that were offered, 50% reported that the assessments should be conducted according to their treatment schedule. The majority of providers thought fatigue assessments should be administered at each MD visit. CONCLUSION: Patients and providers differed about the perceived usefulness of displaying fatigue scores and the frequency with which routine assessments should be conducted. However, both patients and providers appeared to endorse the notion that routine assessments would be beneficial. Integration of routine assessments of commonly experienced symptoms such as fatigue may have important implications for improving symptom management in the future, ultimately resulting in better overall patient care.

de Moor, J. S., K. Elder, et al. (2008). "Smoking prevention and cessation interventions for cancer survivors." Seminars in Oncology Nursing 24(3): 180-192.

OBJECTIVES: To provide a systematic review of smoking prevention and cessation interventions that have been conducted with cancer survivors. DATA SOURCES: Published research studies and government reports. CONCLUSION:

Although few interventions have been developed to improve smoking prevention and cessation rates in cancer survivors, existing studies suggest that it is possible to decrease tobacco use in this high-risk population. IMPLICATIONS FOR NURSING PRACTICE: Oncology nurses are in a unique position to build on the current literature to address cancer survivors' tobacco use as part of clinical care. [References: 56]

Demner-Fushman, D., C. Seckman, et al. (2008). "A prototype system to support evidence-based practice." AMIA Annual Symposium Proceedings/AMIA Symposium.: 151-155.

Translating evidence into clinical practice is a complex process that depends on the availability of evidence, the environment into which the research evidence is translated, and the system that facilitates the translation. This paper presents InfoBot, a system designed for automatic delivery of patient-specific information from evidence-based resources. A prototype system has been implemented to support development of individualized patient care plans. The prototype explores possibilities to automatically extract patients problems from the interdisciplinary team notes and query evidence-based resources using the extracted terms. Using 4,335 de-identified interdisciplinary team notes for 525 patients, the system automatically extracted biomedical terminology from 4,219 notes and linked resources to 260 patient records. Sixty of those records (15 each for Pediatrics, Oncology & Hematology, Medical & Surgical, and Behavioral Health units) have been selected for an ongoing evaluation of the quality of automatically proactively delivered evidence and its usefulness in development of care plans.

Donaldson, M. S. (2008). "Taking PROs and patient-centered care seriously: incremental and disruptive ideas for incorporating PROs in oncology practice." Quality of Life Research 17(10): 1323-1330.

Using patient-reported outcomes (PROs) in clinical practice poses challenges for health care teams and organizations to respond to individual patient needs in a timely fashion. Well-validated tools and feasibility studies are available, but successful spread will require knowledge of effective technology dissemination in complex health delivery systems. Given what has been learned about effective implementation, it is reasonable to ask whether the broad adoption of PROs can occur incrementally using current models of care to apply PRO technology. Another approach is to start with patient needs and focus on how to meet those needs most effectively using PROs in new ways of organizing health care.

Dubenske, L. L., M. Y. Chih, et al. (2008). "Development and implementation of a clinician reporting system for advanced stage cancer: initial lessons learned." Journal of the American Medical Informatics Association 15(5): 679-686.

OBJECTIVE: Innovative approaches can strengthen patient-caregiver-clinician information exchange and more effectively address the physical and psychosocial challenges of advanced disease. This study reports initial findings from implementation of the Clinician Report (CR)-a patient and caregiver status

report tool accessible by the oncology clinic team. DESIGN: The CR tracks and communicates essential information from cancer patients and caregivers to the oncology team. The CR conveys patient symptoms, emotional strain, and key concerns. MEASUREMENTS: Authors used a model developed to explain acceptance, implementation, and sustainability of Interactive Health Communication Systems (IHCS) to evaluate implementation of the new CR system. The study carried out qualitative analyses of interviews with clinicians regarding their experience utilizing the Clinician Report. RESULTS: Primary CR benefits included enhancement of patients' clinic visit experiences, greater caregiver involvement, and facilitation of earlier interventions. Challenges included CR functional issues, users' desire for greater depth of information, user privacy concerns, and limited patient use. These findings are discussed using parameters of the implementation model. Limitations of this study include its small clinician sample size, which represented only a portion of existing organizational settings in which CR systems might be implemented. CONCLUSION: Though in its early implementation stages, the CR demonstrates the potential to positively impact care delivery in the cancer clinic setting, particularly by facilitating earlier interventions and improving patient-caregiver-clinician communication both during and between clinic visits.

Dupont, A., J. Wheeler, et al. (2009). "Use of tablet personal computers for sensitive patient-reported information." The Journal of Supportive Oncology 7(3): 91-97.

Notebook-style computers (e/Tablets) are increasingly replacing paper methods for collecting patient-reported information. Discrepancies in data between these methods have been found in oncology for sexuality-related questions. A study was performed to formulate hypotheses regarding causes for discrepant responses and to analyze whether electronic data collection adds value over paper-based methods when collecting data on sensitive topics. A total of 56 breast cancer patients visiting Duke Breast Clinic (North Carolina) participated by responding to 12 subscales of 5 survey instruments in electronic (e/Tablet) format and to a paper version of 1 of these surveys, at each visit. Twenty-one participants (38%) provided dissimilar responses on paper and electronic surveys to one item of the Functional Assessment of Cancer Therapy-General (FACT-G) Social Well-Being scale that asked patients to rate their satisfaction with their current sex life. Among these 21 patients were 8 patients who answered the question in the electronic environment, and 13 patients who answered both paper and electronic versions but with different responses. Eleven patients (29%) did not respond to the item on either e/Tablet or paper; 45 patients (80%) answered it on e/Tablet; and 37 patients (66%) responded on the paper version. The e/Tablet electronic system may provide a "safer" environment than paper questionnaires for cancer patients to answer private or highly personal questions on sensitive topics such as sexuality.

Dy, S. M., K. A. Lorenz, et al. (2010). "Cancer Quality-ASSIST supportive oncology quality indicator set: feasibility, reliability, and validity testing." Cancer 116(13): 3267-3275.

BACKGROUND: Although measuring the quality of symptom management and end-of-life care could help provide a basis for improving supportive care for advanced cancer, few quality indicators in this area have been rigorously developed or evaluated. METHODS: The authors conducted a pilot evaluation of a comprehensive set of 92 supportive oncology quality indicators, Cancer Quality-ASSIST, including outpatient and hospital indicators for symptoms commonly related to cancer and its treatment and information and care planning. They operationalized the indicators and developed an electronic abstraction tool and extensive guidelines and training materials. Quality assurance nurses abstracted the medical records for 356 advanced cancer patients in 2 settings: a Veterans Administration hospital and an academic hospital and cancer center. The authors evaluated the indicators' feasibility, inter-rater reliability, and validity. RESULTS: The authors successfully evaluated 78 indicators across the domains; results were similar in the 2 settings. They could not feasibly evaluate 3 indicators because of low prevalence; 22 indicators had significant inter-rater reliability issues, 9 had significant validity issues, and 3 had both reliability and validity issues, leaving a set of 41 indicators most promising for further testing and use in this population, with an overall kappa score of 0.85 for specified care. CONCLUSIONS: Of 92 Cancer Quality-ASSIST quality indicators for symptoms, treatment toxicity, and information and care planning, 41 were sufficiently feasible, reliable, and valid to be used for patients with advanced cancer in these settings. This set of indicators shows promise for describing key supportive care processes in advanced cancer.

Eccher, C., A. Seyfang, et al. (2009). "Embedding oncologic protocols into the provision of care: the Oncocure project." Studies in Health Technology & Informatics 150: 663-667.

A computerized Decision Support System (CDSS) can improve the adherence of the clinicians to clinical guidelines and protocols. Integrating it within the clinical workflow can reduce the workload of the physicians, and improve the acceptance of the system. The building of a prescriptive CDSS and its integration with a legacy cancer patient management system is the aim of the Oncocure project, which implements the existing protocol for the medical treatment of breast cancer in the Asbru language, and interfaces the Asbru interpreter with the Electronic Patient Record (EPR) in use in an oncologic unit. Our work is not constrained to a specific domain or EPR implementation, but can be generalized to other fields of medicine and patient management systems. When implemented, our CDSS is expected to reduce the cost of care while improving the adherence to the guideline and the quality of the documentation.

Eich, H. T., R. Engenhart-Cabillic, et al. (2008). "Quality control of involved field radiotherapy in patients with early-favorable (HD10) and early-unfavorable (HD11) Hodgkin's lymphoma: an analysis of the German Hodgkin Study Group." International Journal of Radiation Oncology, Biology, Physics 71(5): 1419-1424.

PURPOSE: The German Hodgkin Study Group (GHSG) set up a radiotherapy (RT) reference center within the Department of Radiation Oncology at the

University of Cologne to undertake quality assurance of the group's clinical studies. In the HD10 trial (early-favorable stages) and HD11 trial (early-unfavorable stages) all patients received involved field (IF)-RT (30 Gy vs. 20 Gy) within a combined-modality approach. For these patients a central prospective review of all diagnostic imaging was performed by expert radiation oncologists to control disease extension and to define IF treatment volume. METHODS AND MATERIALS: On the basis of simulation films, verification films, and radiotherapy case report form (CRF) an expert panel evaluated retrospectively the adequacy of irradiated IF treatment portals according to the RT prescription, applied radiation doses, treatment time, and technical parameters. RESULTS: Between 1999 and 2006 a total of 825 of 1370 randomized patients of the HD10 trial (60%) and 954 of 1422 patients of the HD11 trial (67%) were evaluated by the panel. Radiotherapy was rated as suboptimal in 47% of all reviewed cases. Although the participating RT centers received a precise RT prescription, most difficulties occurred in the adequate coverage of the IF (40%), followed by technical faults (12%). Deviations from the prescribed single daily dose (1.8-2 Gy), weekly dose, and total reference dose were rare (1%). CONCLUSIONS: As a consequence of these findings, radiation oncologists were trained on the definition of IF-RT at GHSG meetings and at the annual meetings of the German Society for Therapeutic Radiation Oncology. Possible correlations between RT quality and relapse rate will be investigated.

Ekenze, S. O. and E. A. Ameh (2010). "Evaluation of relevance of the components of Pediatric Surgery residency training in West Africa." Journal of Pediatric Surgery 45(4): 801-805.

PURPOSE: The aim of the study was to determine if pediatric surgery residency training program in West Africa addresses the realities of posttraining practice. METHODS: The study used a cross-sectional survey of 36 pediatric surgeons trained in West Africa using self-administered questionnaires. RESULTS: Overall, 26 (72%) responded. Although 21 (81%) had adequate exposures in most surgical components of training, 18 (69%) were exposed to most of the nonsurgical components. The least in exposure and use were prenatal management, microvascular and laparoscopic surgeries, hospital administration, and finance management. Pediatric urology, gastroenterology, oncology, trauma, neonatal surgery, burn management, and hepatobiliary surgery were rated as useful and relevant to practice by 22 (85%) of the respondents. Many nonsurgical areas that receive less emphasis in training were regarded as useful in practice by all respondents including ethical decision making, accessing scientific literature, communication skills with colleagues and patient's guardian, and medical research. Significant challenges to training were lack of tertiary children's hospital, dearth of facilities, and inadequate mentoring. CONCLUSION: The components of pediatric surgery training program in West Africa are relevant to the practice of the specialty in our setting. Areas that may enhance training outcome include improving exposure to all components through multi-institutional and international collaboration and improving existing facilities. Copyright 2010 Elsevier Inc. All rights reserved.

Ellison, L. (2009). "The critical limitations of volume-outcome analysis." Urologic Oncology 27(4): 422-426.

There is a justified assumption that the patient outcome is in large part determined by the quality of the care they receive. For certain procedures outside of the field of urology, it has been demonstrated that higher surgical volume, either at the hospital or surgeon level is a proxy for higher quality of care. Multiple studies have followed this line of inquiry and attempted to show that volume may also predict outcome for certain urologic procedures. Review of the published studies shows that the association appears quite weak. However, the real weakness of this line of study is not so much in the findings, but in the universally used and critically flawed study methodology. This article demonstrates how a simple study design flaw has proved to be the Achilles heal of this entire line of research.

Erickson, D., L. Greer, et al. (2010). "A hybrid integrated services digital network-internet protocol solution for resident education." Telemedicine Journal & E-Health 16(4): 454-460.

OBJECTIVE: The purpose of this study was to explore the effectiveness of incorporating Web-based application sharing of virtual medical simulation software within a multipoint video teleconference (VTC) as a training tool in graduate medical education. MATERIALS AND METHODS: National Capital Consortium Radiation Oncology Residency Program resident and attending physicians participated in dosimetry teaching sessions held via VTC using Acrobat Connect application sharing. Residents at remote locations could take turns designing radiation treatments using standard three-dimensional planning software, whereas instructors gave immediate feedback and demonstrated proper techniques. Immediately after each dosimetry lesson, residents were asked to complete a survey that evaluated the effectiveness of the session. At the end of a 3-month trial of using Adobe Connect, residents completed a final survey that compared this teaching technology to the prior VTC-alone method. RESULTS: The mean difference from equality across all quality measures from the weekly survey was 0.8, where 0 indicated neither enhanced nor detracted from the learning experience and 1 indicated a minor enhancement in the learning experience. The mean difference from equality across all measures from the final survey comparing use of application sharing with VTC to VTC alone was 1.5, where 1 indicated slightly better and 2 indicated a somewhat better experience. CONCLUSIONS: The teaching efficacy of multipoint VTC is perceived by medical residents to be more effective when complemented by application-sharing software such as Adobe Acrobat Connect.

Fabel, M., H. Bolte, et al. (2011). "Semi-automated volumetric analysis of lymph node metastases during follow-up--initial results." European Radiology 21(4): 683-692.

OBJECTIVE: Quantification of tumour burden in oncology requires accurate and reproducible evaluation. The current standard is RECIST measurement with its inherent disadvantages. Volumetric analysis is an alternative for therapy

monitoring. The aim of this study was to evaluate the feasibility of volumetric analysis of lymph node metastases using a software prototype in a follow-up setting. METHODS: MSCT was performed in 50 patients covering the chest, abdomen and pelvis. A total of 174 suspicious lymph nodes were evaluated by two radiologists regarding short axis diameters and volumetric analysis using semi-automated software. Quality of segmentation, time, maximum diameter and volume were documented. Variability of the derived change rates was computed as the standard deviation of the difference of the obtained respective change rates. RESULTS: The software performance provides robust volumetric analysis. Quality of segmentation was rated acceptable to excellent in 76-79% by each reader. Mean time spent per lesion was 38 s. The variability of change in effective diameters was 10.6%; for change rates of RECIST maximum diameter variability was 27.5%. CONCLUSION: Semi-automated volumetric analysis allows fast and convenient segmentation of most lymph node metastases. Compared with RECIST the inter-observer-variability in baseline and follow-up is reduced. This should principally allow subtle changes to be subclassified within the RECIST stable range as minor response [-15% to +10%].

Fairchild, A., E. Barnes, et al. (2009). "International patterns of practice in palliative radiotherapy for painful bone metastases: evidence-based practice?" International Journal of Radiation Oncology, Biology, Physics 75(5): 1501-1510.

PURPOSE: Multiple randomized controlled trials have demonstrated the equivalence of multifraction and single-fraction (SF) radiotherapy for the palliation of painful bone metastases (BM). However, according to previous surveys, SF schedules remain underused. The objectives of this study were to determine the current patterns of practice internationally and to investigate the factors influencing this practice. METHODS AND MATERIALS: The members of three global radiation oncology professional organizations (American Society for Radiology Oncology [ASTRO], Canadian Association of Radiation Oncology [CARO], Royal Australian and New Zealand College of Radiologists) completed an Internet-based survey. The respondents described what radiotherapy dose fractionation they would recommend for 5 hypothetical cases describing patients with single or multiple painful BMs from breast, lung, or prostate cancer. Radiation oncologists rated the importance of patient, tumor, institution, and treatment factors, and descriptive statistics were compiled. The chi-square test was used for categorical variables and the Student t test for continuous variables. Logistic regression analysis identified predictors of the use of SF radiotherapy. RESULTS: A total of 962 respondents, three-quarters ASTRO members, described 101 different dose schedules in common use (range, 3 Gy/1 fraction to 60 Gy/20 fractions). The median dose overall was 30 Gy/10 fractions. SF schedules were used the least often by ASTRO members practicing in the United States and most often by CARO members. Case, membership affiliation, country of training, location of practice, and practice type were independently predictive of the use of SF. The principal factors considered when prescribing were prognosis, risk of spinal cord compression, and performance status. CONCLUSION: Despite abundant evidence, most radiation oncologists continue

to prescribe multifraction schedules for patients who fit the eligibility criteria of previous randomized controlled trials. Our results have confirmed a delay in the incorporation of evidence into practice for palliative radiotherapy for painful bone metastases.

Faygelman, V., D. Hunt, et al. (2010). "Validation of Pinnacle treatment planning system for use with Novalis delivery unit." Journal of Applied Clinical Medical Physics 11(3): 3240.

For an institution that already owns the licenses, it is economically advantageous and technically feasible to use Pinnacle TPS (Philips Radiation Oncology Systems, Fitchburg, WI) with the BrainLab Novalis delivery system (BrainLAB A.G., Heimstetten, Germany). This takes advantage of the improved accuracy of the convolution algorithm in the presence of heterogeneities compared with the pencil beam calculation, which is particularly significant for lung SBRT treatments. The reference patient positioning DRRs still have to be generated by the BrainLab software from the CT images and isocenter coordinates transferred from Pinnacle. We validated this process with the end-to-end hidden target test, which showed an isocenter positioning error within one standard deviation from the previously established mean value. The Novalis treatment table attenuation is substantial (up to 6.2% for a beam directed straight up and up to 8.4% for oblique incidence) and has to be accounted for in calculations. A simple single-contour treatment table model was developed, resulting in mean differences between the measured and calculated attenuation factors of 0.0%-0.2%, depending on the field size. The maximum difference for a single incidence angle is 1.1%. The BrainLab micro-MLC (mMLC) leaf tip, although not geometrically round, can be represented in Pinnacle by an arch with satisfactory dosimetric accuracy. Subsequently, step-and-shoot (direct machine parameter optimization) IMRT dosimetric agreement is excellent. VMAT (called "SmartArc" in Pinnacle) treatments with constant gantry speed and dose rate are feasible without any modifications to the accelerator. Due to the 3 mm-wide mMLC leaves, the use of a 2 mm calculation grid is recommended. When dual arcs are used for the more complex cases, the overall dosimetric agreement for the SmartArc plans compares favorably with the previously reported results for other implementations of VMAT: gamma(3%,3mm) for absolute dose obtained with the biplanar diode array passing rates above 97% with the mean of 98.6%. However, a larger than expected dose error with the single-arc plans, confined predominantly to the isocenter region, requires further investigation.

Field, H. I., S. A. Scollen, et al. (2009). "Seq4SNPs: new software for retrieval of multiple, accurately annotated DNA sequences, ready formatted for SNP assay design." BMC Bioinformatics 10: 180.

BACKGROUND: In moderate-throughput SNP genotyping there was a gap in the workflow, between choosing a set of SNPs and submitting their sequences to proprietary assay design software, which was not met by existing software. Retrieval and formatting of sequences flanking each SNP, prior to assay design, becomes rate-limiting for more than about ten SNPs, especially if annotated for

repetitive regions and adjacent variations. We routinely process up to 50 SNPs at once. IMPLEMENTATION: We created Seq4SNPs, a web-based, walk-away software that can process one to several hundred SNPs given rs numbers as input. It outputs a file of fully annotated sequences formatted for one of three proprietary design softwares: TaqMan's Primer-By-Design FileBuilder, Sequenom's iPLEX or SNPstream's Autoprimer, as well as unannotated fasta sequences. We found genotyping assays to be inhibited by repetitive sequences or the presence of additional variations flanking the SNP under test, and in multiplexes, repetitive sequence flanking one SNP adversely affects multiple assays. Assay design software programs avoid such regions if the input sequences are appropriately annotated, so we used Seq4SNPs to provide suitably annotated input sequences, and improved our genotyping success rate. Adjacent SNPs can also be avoided, by annotating sequences used as input for primer design. CONCLUSION: The accuracy of annotation by Seq4SNPs is significantly better than manual annotation (P < 1e-5).Using Seq4SNPs to incorporate all annotation for additional SNPs and repetitive elements into sequences, for genotyping assay designer software, minimizes assay failure at the design stage, reducing the cost of genotyping. Seq4SNPs provides a rapid route for replacement of poor test SNP sequences. We routinely use this software for assay sequence preparation. Seq4SNPs is available as a service at (http://moya.srl.cam.ac.uk/oncology/bio/s4shome.html) and (http://moya.srl.cam.ac.uk/cgi-bin/oncology/srl/ncbi/seq4snp1.pl), currently for human SNPs, but easily extended to include any species in dbSNP.

Finan, M. A. and R. P. Rocconi (2010). "Overcoming technical challenges with robotic surgery in gynecologic oncology." Surgical Endoscopy 24(6): 1256-1260.

BACKGROUND: The majority of data published on robotic surgery in gynecologic oncology has focused on patient outcomes and surgical data. We have found that technical challenges due to the complexity of the robotic technology create a separate set of issues, adding time and difficulty to the actual surgical procedure. This study focuses on these technical problems and identifies pitfalls and potential solutions in robotics. METHODS: All patients who underwent robotic surgery for gynecologic oncology indications from August 2006 through July 2008 were eligible for inclusion in the study. Data collected prospectively included demographics, surgical and clinicopathologic data, and technical problems with the robotic equipment. RESULTS: One hundred thirty-seven patients underwent robotic surgery during the study period. A total of 11 cases (8.02%) were associated with problems with robotic technology: 2/11 (18.2%) involved malfunction of robotic arms, 2/11 (18.2%) involved light or camera cords, and the remainder included a variety of problems, including malfunction of Maylard bipolar instrument [1/11 (9.1%)], power failure requiring reboot of robot [1/11 (9.1%)], port problems [2/11 (18.2%)], and 3/1 (27.3%) had miscellaneous problems. An estimated average of 25 min was added to each of these 11 cases in order to solve robot-related technological problems. No cases required conversion to laparotomy. All problems were solved by the robotic surgeon with the assistance of robotic surgery staff. CONCLUSIONS: Surgeons

performing robotic surgery must become familiar with troubleshooting robotic technology. Several issues related to technical problems may arise, delaying progression of the case, and potential solutions were identified. As this technology is implemented, robotic surgeons must be trained to solve problems related to the robotic technology and associated equipment. Failure to do so may add time and technical difficulty to robotic cases.

Fischel, R. J. and R. O. Dillman (2009). "Developing an effective lung cancer program in a community hospital setting." Clinical Lung Cancer 10(4): 239-243.

Lung cancer remains the number one cause of cancer-based mortality in men and women. The importance of proper lung cancer care outside of major academic centers cannot be overemphasized because the vast majority of lung cancer care occurs in community hospital settings. We have had the opportunity to develop a highly successful community hospital-based lung cancer program. Utilizing a multidisciplinary approach, we have achieved steadily improving survival rates that are much higher than those observed nationally for patients diagnosed with lung cancer. Key components of this successful program include: (1) a weekly multidisciplinary lung cancer case conference with medical doctor representatives from medical oncology, thoracic surgery, pulmonary medicine, radiology, radiation oncology, and nuclear medicine who discuss patient presentation, test results, treatment history, and plans for therapy; (2) thoracic surgeons skilled in minimally invasive video-assisted thoracoscopic surgery; (3) nurse navigator/coordinators to help patients through the process from detection to recovery and provide a personal bond that greatly improves patient satisfaction; (4) utilization of treatment guidelines for patient-specific treatment strategies; (5) formal continuing medical education; (6) an emphasis on early detection that includes consideration of computed tomography screening of former smokers; (6) a cancer center that allows for many services to be offered at a single location for patient convenience and to promote interdisciplinary care; and (7) access to research protocols. These components have helped us provide a quality lung cancer program in a community hospital setting that is associated with excellent clinical outcomes.

Fleisher, L., J. Buzaglo, et al. (2008). "Using health communication best practices to develop a web-based provider-patient communication aid: the CONNECT study." Patient Education & Counseling 71(3): 378-387.

OBJECTIVE: Although there is broad consensus that careful content vetting and user testing is important in the development of technology-based educational interventions, often these steps are overlooked. This paper highlights the development of a theory-guided, web-based communication aid (CONNECT), designed to facilitate treatment decision-making among patients with advanced cancer. METHODS: The communication aid included an on-line survey, patient skills training module and an automated physician report. Development steps included: (1) evidence-based content development; (2) usability testing; (3) pilot testing; and (4) patient utilization and satisfaction. RESULTS: Usability testing identified some confusing directions and navigation for the on-line survey and

validated the relevance of the "patient testimonials" in the skills module. Preliminary satisfaction from the implementation of the communication aid showed that 66% found the survey length reasonable and 70% found it helpful in talking with the physician. Seventy percent reported the skills module helpful and about half found it affected the consultation. CONCLUSION: Designing patient education interventions for translation into practice requires the integration of health communication best practice including user feedback along the developmental process. PRACTICE IMPLICATIONS: This developmental process can be translated to a broad array of community-based patient and provider educational interventions.

Flynn, K. E., D. D. Jeffery, et al. (2011). "Sexual functioning along the cancer continuum: focus group results from the Patient-Reported Outcomes Measurement Information System (PROMIS)." Psycho-Oncology 20(4): 378-386.

OBJECTIVE: Cancer and treatments for cancer affect specific aspects of sexual functioning and intimacy; however, limited qualitative work has been done in diverse cancer populations. As part of an effort to improve measurement of self-reported sexual functioning, we explored the scope and importance of sexual functioning and intimacy to patients across cancer sites and along the continuum of care. METHODS: We conducted 16 diagnosis- and sex-specific focus groups with patients recruited from the Duke University tumor registry and oncology/hematology clinics (N=109). A trained note taker produced field notes summarizing the discussions. An independent auditor verified field notes against written transcripts. The content of the discussions was analyzed for major themes by two independent coders. RESULTS: Across all cancers, the most commonly discussed cancer- or treatment-related effects on sexual functioning and intimacy were fatigue, treatment-related hair loss, weight gain and organ loss or scarring. Additional barriers were unique to particular diagnoses, such as shortness of breath in lung cancer, gastrointestinal problems in colorectal cancers and incontinence in prostate cancer. Sexual functioning and intimacy were considered important to quality of life. While most effects of cancer were considered negative, many participants identified improvements to intimacy after cancer. CONCLUSION: Overall evaluations of satisfaction with sex life did not always correspond to specific aspects of functioning (e.g. erectile dysfunction), presenting a challenge to researchers aiming to measure sexual functioning as an outcome. Health-care providers should not assume that level of sexual impairment determines sexual satisfaction and should explore cancer patients' sexual concerns directly. Copyright Copyright 2010 John Wiley & Sons, Ltd.

Flynn, K. E., R. A. Shelby, et al. (2010). "Sleep-wake functioning along the cancer continuum: focus group results from the Patient-Reported Outcomes Measurement Information System (PROMIS())." Psycho-Oncology 19(10): 1086-1093.

OBJECTIVE: Cancer and its treatments disturb sleep-wake functioning; however, there is little information available on the characteristics and consequences of sleep problems associated with cancer. As part of an effort to improve measurement of sleep-wake functioning, we explored the scope of difficulties

with sleep in a diverse group of patients diagnosed with cancer. METHODS: We conducted 10 focus groups with patients recruited from the Duke University tumor registry and oncology/hematology clinics. Separate groups were held with patients scheduled to begin or currently undergoing treatment for breast, prostate, lung, colorectal, hematological, and other cancer types and with patients who were in posttreatment follow-up. The content of the focus group discussions was transcribed and analyzed for major themes by independent coders. RESULTS: Participants not only reported causes of sleep disturbance common in other populations, such as pain and restless legs, but they also reported causes that may be unique to cancer populations, including abnormal dreams, anxiety about cancer diagnosis and recurrence, night sweats, and problems with sleep positioning. Many participants felt that sleep problems reduced their productivity, concentration, social interactions, and overall quality of life. Many also shared beliefs about the increased importance of sleep when fighting cancer. CONCLUSIONS: The findings underscore the need for interventions that minimize the negative impact of cancer and its treatments on sleep. This study will inform efforts now underway to develop a patient-reported measure of sleep-wake functioning that reflects the breadth of concepts considered important by patients with cancer. Copyright Copyright 2009 John Wiley & Sons, Ltd.

Fratino, L. M., D. A. Daniel, et al. (2009). "Evaluation of quality improvement initiative in pediatric oncology: implementation of aggressive hydration protocol." Journal of Nursing Care Quality 24(2): 153-159.

Our goal was to improve the efficiency of chemotherapy administration for pediatric oncology patients. We identified prechemotherapy hydration as the process that most often delayed chemotherapy administration. An aggressive hydration protocol, supported by fluid order sets, was developed for patients receiving planned chemotherapy. The mean interval from admission to achieving adequate hydration status was reduced significantly from 4.9 to 1.4 hours with a minor reduction in the time to initiate chemotherapy from 9.6 to 8.6 hours. Chemotherapy availability became the new rate-limiting process.

Freeman, L., L. Cohen, et al. (2008). "The experience of imagery as a post-treatment intervention in patients with breast cancer: program, process, and patient recommendations." Oncology Nursing Forum 35(6): E116-121.

PURPOSE/OBJECTIVES: To better understand the common themes of women participating in an imagery program designed to improve quality of life (QOL). RESEARCH APPROACH: Qualitative. SETTING: Classroom setting at Alaska Regional Hospital in Anchorage. PARTICIPANTS: 10 women with a confirmed diagnosis of breast cancer who had completed conventional care participated in a six-class, eight-week-long imagery program titled Envision the Rhythms of Life (ERL). METHODOLOGIC APPROACH: Focus group audio recordings and notes were interpreted with the Krueger focus group method and confirmed by an outside evaluator. MAIN RESEARCH VARIABLES: Breast cancer survivors' descriptions of imagery practice and experience as they created passive, active,

and targeted imagery. FINDINGS: Participants reported the importance of engaging passive and active imagery, letting targeted imagery take on a life of its own, performing homework, understanding the science, practicing, hearing imagery stories, engaging all the senses, trusting imagery, and group interaction. Imagery practice improved mood state. CONCLUSIONS: When delivered by expert imagery trainers in collaboration with oncology nurses, ERL can improve breast cancer survivors' QOL. The present study is one of few reports that evaluated survivors' imagery experiences from a clinical trial and produced significant QOL improvements. INTERPRETATION: The present study provides oncology nurses understanding of the psychological risks faced by breast cancer survivors after completion of primary care and explains the critical need for post-treatment programs for survivors dealing with post-traumatic stress disorder, depression, anxiety, or high levels of stress.

Furukawa, T., T. Inaniwa, et al. (2010). "Performance of the NIRS fast scanning system for heavy-ion radiotherapy." Medical Physics 37(11): 5672-5682.

PURPOSE: A project to construct a new treatment facility, as an extension of the existing HIMAC facility, has been initiated for the further development of carbon-ion therapy at NIRS. This new treatment facility is equipped with a 3D irradiation system with pencil-beam scanning. The challenge of this project is to realize treatment of a moving target by scanning irradiation. To achieve fast rescanning within an acceptable irradiation time, the authors developed a fast scanning system. METHODS: In order to verify the validity of the design and to demonstrate the performance of the fast scanning prior to use in the new treatment facility, a new scanning-irradiation system was developed and installed into the existing HIMAC physics-experiment course. The authors made strong efforts to develop (1) the fast scanning magnet and its power supply, (2) the high-speed control system, and (3) the beam monitoring. The performance of the system including 3D dose conformation was tested by using the carbon beam from the HIMAC accelerator. RESULTS: The performance of the fast scanning system was verified by beam tests. Precision of the scanned beam position was less than +/-0.5 mm. By cooperating with the planning software, the authors verified the homogeneity of the delivered field within +/-3% for the 3D delivery. This system took only 20 s to deliver the physical dose of 1 Gy to a spherical target having a diameter of 60 mm with eight rescans. In this test, the average of the spot-staying time was considerably reduced to 154 micros, while the minimum staying time was 30 micros. CONCLUSIONS: As a result of this study, the authors verified that the new scanning delivery system can produce an accurate 3D dose distribution for the target volume in combination with the planning software.

Garcia Jorda, E. (2010). "A summary in time." Clinical & Translational Oncology: Official Publication of the Federation of Spanish Oncology Societes & of the National Cancer Institute of Mexico 12(2): 72-74.

Gaze, M. N., T. Boterberg, et al. (2010). "Development of an electronic database for

quality assurance of radiotherapy in the International Society of Paediatric Oncology (Europe) high risk neuroblastoma study." Radiotherapy & Oncology 97(3): 593-595.

Quality assurance of radiotherapy is an important determinant of outcome in some cancers. SIOPEN-R-NET developed a computerised remote data entry system for recording imaging and treatment parameters for its multimodality high risk neuroblastoma study. This will enable investigation of the relationship between radiotherapy quality and local control. Copyright Copyright 2010 Elsevier Ireland Ltd. All rights reserved.

Geffen, D. B., N. Amir, et al. (2009). "Stage I breast cancer in a regional oncology practice in Israel 2002-2006: clinicopathologic features, risk estimation and planned therapy of 328 consecutive patients." Breast 18(5): 316-321.

We present the clinicopathologic features and treatment plans of 328 consecutive stage I (T1N0M0) breast cancer patients seen at a regional medical center in Israel. Predicted 10-year mortality risk was calculated using the Adjuvant! Online website. The 21-gene recurrence score (RS) (OncotypeDx) was obtained on a minority of patients. Eighty-nine per cent of patients had estrogen receptor (ER) and/or progesterone receptor (PgR) positive tumors. In 43.3% of patients history of an invasive malignancy was reported in a first degree relative and in 15.5% specifically breast and/or ovarian cancer was reported. Chemotherapy was added to endocrine therapy in 59 ER/PgR positive patients, decreasing predicted 10-year mortality risk by a median of 1.8%. Individualized risk estimation by genetic analysis may further decrease the use of chemotherapy in stage I patients. Breast cancer screening may provide an opportunity to identify cancer prone families.

Gersten, D. B. and S. G. Langer (2011). "Programming in the small." Journal of Digital Imaging 24(1): 142-150.

Academic medical centers, in general, and radiation oncology research, in particular, rely heavily on custom software tools and applications. The code development is typically the responsibility of a single individual or at most a small team. Often these individuals are not professional programmers but physicists, students, and physicians. While they possess domain expertise and algorithm knowledge, they often are not fully aware of general "safe coding" practices--nor do they need the full complexity familiar in large commercial software projects to succeed. Rather, some simple guidelines we refer to as "programming in the small" can be used.

Gindl, S., K. Kaiser, et al. (2008). "Syntactical negation detection in clinical practice guidelines." Studies in Health Technology & Informatics 136: 187-192.

In clinical practice guidelines (CPGs) the medical information is stored in a narrative way. A large part of this information occurs in a negated form. The detection of negation in CPGs is an important task since it helps medical personnel to identify not occurring symptoms and diseases as well as treatment actions that should not be accomplished. We developed algorithms capable of Negation Detection in this kind of medical documents. According to our results,

we are convinced that the involvement of syntactical methods can improve Negation Detection, not only in medical writings but also in arbitrary narrative texts.

Girgis, A., J. Cockburn, et al. (2009). "Improving patient emotional functioning and psychological morbidity: evaluation of a consultation skills training program for oncologists." Patient Education & Counseling 77(3): 456-462.

OBJECTIVE: To evaluate whether a consultation skills training (CST) program with oncologists and trainees would improve skills in detecting and responding to patient distress, thereby improving their patients' emotional functioning and reducing psychological distress. METHODS: Randomized-controlled trial with 29 medical and radiation oncologists from Australia randomized to CST group (n=15) or usual-care group (n=14). The CST consisted of a 1.5-day face-to-face workshop incorporating presentation of principles, a DVD modelling ideal behaviour and role-play practice, and four 1.5h monthly video-conferences. At the CST conclusion, patients of participating doctors were recruited (n=192 in CST group, n=183 in usual-care group), completing telephone surveys at baseline, 1 week and 3 months to assess quality of life, anxiety, depression and unmet psychosocial needs. RESULTS: Despite high patient functioning at baseline, anxiety significantly improved at 1-week follow-up in the CST group, compared to the control group. There were no statistically significant differences in emotional functioning, depression or unmet supportive care need between the groups. CONCLUSION: Consistent trends for greater improvements were observed in intervention compared to control group patients, suggesting the CST program deserves wider evaluation. PRACTICE IMPLICATIONS: Video-conferencing after a short training course may be an effective strategy for delivering CST.

Goodden, J. R., D. Yeomanson, et al. (2009). "Care of children with brain and spine tumours - a review of practice." British Journal of Neurosurgery 23(3): 270-275.

Aims and method were to assess the current practice in paediatric tumour management by the departments of neurosurgery and oncology, compare these with nationally agreed recommendations and examine for areas of improvement. Patient records were identified from departmental databases - 30 patients treated from October 2004 to May 2006. Factors assessed included treatment timelines (e.g., referral to admission and imaging, admission to surgery, surgery to further treatment), imaging, MDT discussion, and paediatric neurosurgery & neuro-oncology treatments. Of acute referrals, all patients were admitted within 2 days. All surgery was undertaken by a dedicated paediatric neurosurgeon with paediatric anaesthesia. All cases were discussed in a neuro-oncology MDT prior to surgery and 97% after surgery. In the first 6-months 57% received adjuvant treatment within 40 days; in the remaining period this improved to 91%. When measured against recognised benchmark standards, the SCH paediatric neuro-oncology service appears satisfactory. This study has identified the need to improve certain aspects of care to offer further improvements to the specialist service delivered.

Goytia, E. J., D. W. Lounsbury, et al. (2009). "Establishing a general medical outpatient clinic for cancer survivors in a public city hospital setting." Journal of General Internal Medicine 24 Suppl 2: S451-455.

INTRODUCTION: Many cancer centers and community hospitals are developing novel models of survivorship care. However, few are specifically focused on services for socio-economically disadvantaged cancer survivors. AIMS: To describe a new model of survivorship care serving culturally diverse, urban adult cancer patients and to present findings from a feasibility evaluation. SETTING: Adult cancer patients treated at a public city hospital cancer center. PROGRAM DESCRIPTION: The clinic provides comprehensive medical and psychosocial services for patients within a public hospital cancer center where they receive their oncology care. PROGRAM EVALUATION: Longitudinal data collected over a 3-year period were used to describe patient demographics, patient needs, and services delivered. Since inception, 410 cancer patients have been served. Demand for services has grown steadily. Hypertension was the most frequent comorbid condition treated. Pain, depression, cardiovascular disease, hyperlipidemia, and bowel dysfunction were the most common post-treatment problems experienced by the patients. Financial counseling was an important patient resource. DISCUSSION: This new clinical service has been well-integrated into its public urban hospital setting and constitutes an innovative model of health-care delivery for socio-economically challenged, culturally diverse adult cancer survivors.

Graf, N., A. Hoppe, et al. (2009). "'In silico' oncology for clinical decision making in the context of nephroblastoma." Klinische Padiatrie 221(3): 141-149.

The present paper outlines the initial version of the ACGT (Advancing Clinico-Genomic Trials) -- an Integrated Project, partly funded by the EC (FP6-2005-IST-026996)I-Oncosimulator as an integrated software system simulating in vivo tumour response to therapeutic modalities within the clinical trials environment aiming to support clinical decision making in individual patients. Cancer treatment optimization is the main goal of the system. The document refers to the technology of the system and the clinical requirements and the types of medical data needed for exploitation in the case of nephroblastoma. The outcome of an initial step towards the clinical adaptation and validation of the system is presented and discussed. Use of anonymized real data before and after chemotherapeutic treatment for the case of the SIOP 2001/GPOH nephroblastoma clinical trial constitutes the basis of the clinical adaptation and validation process. By using real medical data concerning nephroblastoma for a single patient in conjunction with plausible values for the model parameters (based on available literature) a reasonable prediction of the actual tumour volume shrinkage has been made possible. Obviously as more and more sets of medical data are exploited the reliability of the model "tuning" is expected to increase. The successful performance of the initial combined ACGT Oncosimulator platform, although usable up to now only as a test of principle, has been a particularly encouraging step towards the clinical translation of the

system, being the first of its kind worldwide. [References: 57]

Grainger, M. N., S. Hegarty, et al. (2010). "Discussing the transition to palliative care: evaluation of a brief communication skills training program for oncology clinicians." Palliative & Supportive Care 8(4): 441-447.

OBJECTIVE: Discussing the transition from active anti-cancer treatment to palliative care can be difficult for cancer patients and oncology health professionals (OHP). We developed a brief communication skills workshop to assist OHP with these conversations, and examined satisfaction with the workshop and perceived confidence regarding these discussions. METHOD: Interactive workshops were conducted by trained facilitators and included cognitive, behavioral, and experiential components. The major component of the workshop involved role-plays with trained actors (simulated patients). Participants completed an evaluation questionnaire. RESULTS: Sixty-two OHP participated in workshops. Overall, participants were highly satisfied with the workshop content and format. All participants felt the workshop provided relevant practical information, and > 80% thought that participation benefited their work. Over 98% said that the workshop had increased confidence in their communication skills. SIGNIFICANCE OF RESULTS: Participants were very satisfied with the workshop, and thought that participation increased confidence in communicating about the transition to palliative care. Dissemination of this model of communication skills training seems warranted.

Greenberg, M., A. Klassen, et al. (2011). "Outcomes and metrics: measuring the impact of a comprehensive adolescent and young adult cancer program." Cancer 117(10 Suppl): 2342-2350.

Against a background of poorly coordinated provision of holistic care to the adolescent and young adult (AYA) cancer population, the Canadian National Task Force on Adolescent and Young Adult Oncology, which is supported by the Canadian Partnership Against Cancer and the C17 network, convened a workshop to formulate the components of a systematic approach to care for this age group. Because such a program will deflect scarce resources, it must be validated and justified by reproducible metrics. A subgroup of experts was convened, comprising attendees at the AYA workshop, including AYA cancer survivors. A substantial number of key, feasible, and consistent metrics were identified and are systematized, justified, and presented in this article. Prioritization from within this range will be necessary. Copyright 2011 American Cancer Society

Grimsbo, G. H., A. Finset, et al. (2011). "Left hanging in the air: experiences of living with cancer as expressed through E-mail communications with oncology nurses." Cancer Nursing 34(2): 107-116.

BACKGROUND: Cancer patients experience many physical, psychosocial, and existential problems and worries during their illness. To support patients in managing their illness, we implemented an online patient-nurse communication (OPNC) service, where breast and prostate cancer patients could ask questions

and receive advice from oncology nurses. OBJECTIVE: The aim of this study was to explore the use and content of patients' e-mail messages sent to oncology nurses and thus gain a "snapshot" of patients' experiences of living with cancer as expressed through these messages. METHODS: Using qualitative content analysis, 276 messages from 60 breast and prostate cancer patients were analyzed. Messages were coded into categories and major themes. Both manifest and latent content was coded. RESULTS: Four main themes emerged from patients' messages: (1) living with symptoms and side effects, (2) living with a fear of relapse, (3) concerns for everyday life, and (4) unmet information needs from health care providers. CONCLUSIONS: Patients used the OPNC service actively to pose questions and raise concerns related to symptom experiences, fear of relapses, and uncertainty in everyday life. However, patients also expressed experiences of being "left in a void" after being discharged from hospital and living with serious unmet informational needs. IMPLICATIONS FOR PRACTICE: The study demonstrated that online communication can provide patients with a space for otherwise unmet questions and worries and that they will seek support from nurses online when given the opportunity. Therefore, OPNC can be an important means and supplement to traditional health care in the effort to support patients to better manage their illness.

Guedea, F., M. Ventura, et al. (2008). "Patterns of care for brachytherapy in Europe: facilities and resources in brachytherapy in the European area." Brachytherapy 7(3): 223-230.

PURPOSE: The objective of the survey was to obtain detailed information on the use of brachytherapy through a web-based questionnaire. The present article describes the resources available in 2002. METHODS AND MATERIALS: The European area was divided into three groups: Group I included the 15 original member countries of the European Union plus 4 others according to economic wealth; Group II included the 10 most recent members of the European Union; and Group III included 14 other European countries. A national coordinator was designated for each country with a general coordinator to oversee the project to encourage the participation of every radiotherapy center. RESULTS: Three hundred forty-eight (47.2%) of the responding centers provided brachytherapy services and, compared to data from 1997, most showed a significant increase in the mean number of brachytherapy patients per center. The average number of radiation oncologists involved in brachytherapy was similar in the three groups. The average workload estimated in hours per week at the cancer centers was, however, higher in Groups II and III. Most centers had at least one treatment planning system, although in Group I 7.7% of the centers had three or more treatment planning systems. CONCLUSIONS: Notable differences in brachytherapy treatment were observed, especially in the workload of radiation oncologists and physicists in Groups II and III, the two groups with largest number of patients. New surveys can provide a detailed analysis of changes over time, a potentially useful tool to eliminate the differences observed.

Gueguen, J. A., C. L. Bylund, et al. (2009). "Conducting family meetings in palliative

care: themes, techniques, and preliminary evaluation of a communication skills module." Palliative & Supportive Care 7(2): 171-179.

OBJECTIVE: To develop a communication skills training module for health care professionals about how to conduct a family meeting in palliative care and to evaluate the module in terms of participant self-efficacy and satisfaction. METHODS: Forty multispecialty health care professionals from the New York metropolitan area attended a communication skills training module at a Comprehensive Cancer Center about how to conduct a family meeting in oncology. The modular content was based on the Comskil model and current literature in the field. RESULTS: Based on a retrospective pre-post measure, participants reported a significant increase in self-efficacy about their ability to conduct a family meeting. Furthermore, at least 93% of participants expressed their satisfaction with various aspects of the module by agreeing or strongly agreeing with statements on the course evaluation form. SIGNIFICANCE OF RESULTS: Family meetings play a significant role in the palliative care setting, where family support for planning and continuing care is vital to optimize patient care. Although these meetings can be challenging, this communication skills module is effective in increasing the confidence of participants in conducting a family meeting.

Gupta, T., R. Sarin, et al. (2009). "A pragmatic clinicopathobiological grouping/staging system for gliomas: proposal of the Indian TNM subcommittee on brain tumors." Neurology India 57(3): 247-251.

BACKGROUND: There is no universally accepted staging system for primary brain tumors wherein prognostication is mainly based on complex composite indices. AIM: To develop a simple, pragmatic, and widely applicable grouping/staging system for gliomas, the most common primary brain tumor. MATERIALS AND METHODS: An expert neurooncology panel with representation from radiation oncology, neurosurgery, pathology, radiology, and medical oncology had several rounds of discussion on issues pertinent to brain tumor staging. The trade off was between the accuracy of prognostic categorization and a pragmatic, widely applicable approach. RESULTS AND RECOMMENDATIONS: The Tumor-Node-Metastasis staging was considered irrelevant for gliomas that seldom metastasize to lymphatics or outside the neuraxis. Instead, a 4-point staging/grouping system is proposed, using histological grade as the main prognostic variable and at least one stage migration based on other unfavorable features such as tumor location (brainstem); age (<5 years for all grades, >50 years for high-grade, and >40 years for low-grade gliomas); poor neurological performance status (NPS 2-4); multicentricity and/or gliomatosis; and adverse biological parameters (proliferative index, angiogenesis markers, apoptotic index, cytogenetic abnormalities, and molecular markers). CONCLUSION: In absence of a grouping/staging system for primary brain tumors, prognostification is mostly based on complex composite indices. The proposed clinicopathobiological grouping/staging system for gliomas is a simple, pragmatic, and user-friendly tool with a potential to fulfill the objectives of staging classification.

Hains, I. M., J. M. Fuller, et al. (2009). "Standardizing care in medical oncology: are web-based systems the answer?" Cancer 115(23): 5579-5588.

BACKGROUND: Medical oncology is embracing information technology to standardize care and improve patient outcomes, with a range of Web-based systems used internationally. The authors' aim was to determine the factors affecting the uptake and use of a Web-based protocol system for medical oncology in the Australian setting. METHODS: The authors conducted 50 interviews and observed medical oncology physicians, nurses, and pharmacists in their treatment setting at 6 hospitals in different geographic locations. RESULTS: The Web-based system plays a major role in guiding oncology treatment across participating sites. However, its use varies according to hospital location, clinician roles, and experience. A range of issues impact on clinicians' attitudes toward and use of the Web-based system. Important factors are clinician-specific (eg, their need for autonomy and perceptions of lack of time) or environmental (eg, hospital policy on protocol use, endorsement of the system, and the availability of appropriate infrastructure, such as sufficient computers). The level of education received regarding the system was also found to be integral to its ongoing use. CONCLUSIONS: Although the provision of high-quality evidence-based resources, electronic or otherwise, is essential for standardizing care and improving patient outcomes, the authors' findings demonstrate that this alone does not ensure uptake. It is important to understand end-users, the environment in which they operate, and the basic infrastructure required to implement such a system. Implementation must also be accompanied by continuing education and endorsement to ensure both long-term sustainability and use of the system to its full potential. (c) 2009 American Cancer Society.

Harris, E. E., M. Abdel-Wahab, et al. (2009). "Results of the Association of Directors of Radiation Oncology Programs (ADROP) survey of radiation oncology residency program directors." International Journal of Radiation Oncology, Biology, Physics 74(2): 327-337.

PURPOSE: To survey the radiation oncology residency program directors on the topics of departmental and institutional support systems, residency program structure, Accreditation Council for Graduate Medical Education (ACGME) requirements, and challenges as program director. METHODS: A survey was developed and distributed by the leadership of the Association of Directors of Radiation Oncology Programs to all radiation oncology program directors. Summary statistics, medians, and ranges were collated from responses. RESULTS: Radiation oncology program directors had implemented all current required aspects of the ACGME Outcome Project into their training curriculum. Didactic curricula were similar across programs nationally, but research requirements and resources varied widely. Program directors responded that implementation of the ACGME Outcome Project and the external review process were among their greatest challenges. Protected time was the top priority for program directors. CONCLUSIONS: The Association of Directors of Radiation Oncology Programs recommends that all radiation oncology program directors

have protected time and an administrative stipend to support their important administrative and educational role. Departments and institutions should provide adequate and equitable resources to the program directors and residents to meet increasingly demanding training program requirements.

Hastings, R. J., E. J. Maher, et al. (2008). "An Internet-based external quality assessment in cytogenetics that audits a laboratory's analytical and interpretative performance." European Journal of Human Genetics 16(10): 1217-1224.

A novel approach to external quality assessment (EQA) using the Internet mimics the diagnostic situation so that multiple tests can be requested and EQA cases can be 'tailor made' to address a specific chromosome syndrome, disease, or clinical dilemma. The web-based EQA system was trialled on a large UK EQA scheme, UK NEQAS for Clinical Cytogenetics. It has also been used to implement a new Cytogenetics European Quality Assessment scheme, CEQA, set up with the intention of providing laboratories in countries without access to a local EQA scheme the opportunity of participation in EQA. Overall, Internet-based EQA allows for a varied EQA programme. Poor performance was detected in both CEQA and UK NEQAS constitutional EQA schemes and also in the UK NEQAS oncology EQA scheme. The Internet-based EQA overcomes submission delays due to international surface mail. There is also a reduction in administration and assessors' time compared to a retrospective EQA involving the submission of unique cases for EQA assessment, as participants analyse the same three Internet-based EQA cases simultaneously. Many EU27 (EU member states) laboratories still do not participate in their national EQA schemes, so until EQA participation becomes mandatory as a component of compulsory laboratory accreditation, the quality of laboratory diagnostic service is unpredictable.

Hede, K. (2009). "Electronic medical records: oncology practices take the plunge." Journal of the National Cancer Institute 101(14): 976-983.

Hede, K. (2009). "Increase in oral cancer drugs raises thorny issues for oncology practices." Journal of the National Cancer Institute 101(22): 1534-1536.

Hendrix, C. C., A. Abernethy, et al. (2009). "A pilot study on the influence of an individualized and experiential training on cancer caregiver's self-efficacy in home care and symptom management." Home Healthcare Nurse 27(5): 271-278.

The aim of this pilot study was to investigate if an individualized and experiential training can promote family caregiver's confidence (self-efficacy) in home care and symptom management. The study was conducted in a hematology/oncology unit in a southeastern regional medical center. Twenty informal cancer caregivers participated in the study. The individualized and experiential training was conducted at the bedside prior to patient's hospital discharge. Self-efficacy in home care and cancer symptom management was measured using the Cancer Caregiver Self-Efficacy Measure before and after training, and at 1 week after hospital discharge of cancer patients. Results of the study showed mean Cancer Caregiver Self-Efficacy Measure increased by 41.1 points immediately after the

training ($z = 4.49$, $p < 0.001$) and was 31.7 points higher at 1-week follow-up ($z = 3.22$, $p < 0.01$). The findings of this study suggest that individualized and experiential training may be another avenue for nurses, including home care nurses, to support family home caregiving. By helping family members in home care, favorable patient outcomes may be achieved, enabling older patients with cancer to stay longer in the comfort of their homes.

Hermann, C. P., A. L. Conner, et al. (2008). "Enhancing cancer nursing education through school of nursing partnerships: the Cancer Nursing Faculty Fellows Program." Journal of Nursing Education 47(6): 275-278.

This article describes the Cancer Nursing Faculty Fellows Program, an innovative program designed to provide nurse educators with state-of-the-art cancer knowledge to enhance their ability to teach cancer content. The Faculty Fellows Program was developed at the University of Louisville School of Nursing and was part of a multifaceted educational intervention to improve cancer nursing education. This intervention included comprehensive curriculum reviews, conferences with national consultants, cancer-specific faculty seminars, and funded instructional projects. The Faculty Fellows Program consisted of a mentored experience attending the Oncology Nursing Society Congress and a month-long intensive program to provide faculty with exposure to cancer experts, researchers, and clinical and community resources. By providing a forum for nurse educators to obtain this knowledge and provide the resources they need to change the way they educate nursing students, the program can significantly affect cancer-related nursing education and, ultimately, the care of patients with cancer and survivors.

Hill-Kayser, C. E., C. Vachani, et al. (2009). "An internet tool for creation of cancer survivorship care plans for survivors and health care providers: design, implementation, use and user satisfaction." Journal of Medical Internet Research 11(3): e39.

BACKGROUND: Survivorship care plans have been recommended by the Institute of Medicine for all cancer survivors. We implemented an Internet-based tool for creation of individualized survivorship care plans. To our knowledge, this is the first tool of this type to be designed and made publicly accessible. OBJECTIVE: To investigate patterns of use and satisfaction with an Internet-based tool for creation of survivorship care plans. METHODS: OncoLife, an Internet-based program for creation of survivorship care plans, was designed by a team of dedicated oncology nurses and physicians at the University of Pennsylvania. The program was designed to provide individualized, comprehensive health care recommendations to users responding to queries regarding demographics, diagnosis, and cancer treatments. After being piloted to test populations, OncoLife was made publicly accessible via Oncolink, a cancer information website based at the University of Pennsylvania which averages 3.9 million page views and over 385,000 unique visits per month. Data entered by anonymous public users was maintained and analyzed. RESULTS: From May 2007 to November 2008, 3343 individuals utilized this tool. Most (63%) identified themselves as survivors, but also health care providers (25%) and friends/family

of survivors (12%). Median age at diagnosis was 48 years (18-100+), and median current age 51 (19-100+). Most users were Caucasian (87%), female (71%), and college-educated (82%). Breast cancer was the most common diagnosis (46%), followed by hematologic (12%), gastrointestinal (11%), gynecologic (9%), and genitourinary (8%). Of all users, 84% had undergone surgery, 80% chemotherapy, and 60% radiotherapy. Half of users (53%) reported receiving follow-up care from only an oncologist, 13% only a primary care provider (PCP), and 32% both; 12% reported having received survivorship information previously. Over 90% of users, both survivors and health care providers, reported satisfaction levels of "good" to "excellent" using this tool. CONCLUSIONS: Based on our experience with implementation of what is, to our knowledge, the first Web-based program for creation of survivorship care plans, survivors and health care providers appear both willing to use this type of tool and satisfied with the information provided. Most users have never before received survivorship information. Future iterations will focus on expanding accessibility and improving understanding of the needs of cancer survivors in the era of the Internet.

Hill-Kayser, C. E., C. Vachani, et al. (2009). "Utilization of internet-based survivorship care plans by lung cancer survivors." Clinical Lung Cancer 10(5): 347-352.

BACKGROUND: Persons living after lung cancer remain an important subset of the cancer survivor population who may be at risk for serious health consequences of lung cancer and its treatments. The Institute of Medicine recommends survivorship care plans for all cancer survivors. MATERIALS AND METHODS: A program for the creation of survivorship care plans, OncoLife, was made publicly accessible. Users responded to queries regarding demographics, diagnosis, and treatment and received comprehensive, individualized guidelines for future care addressing issues such as late toxicity, second malignancy, fertility, and tumor recurrence. Data were maintained anonymously with approval from the Institutional Review Board. RESULTS: From May 2007 to November 2008, 3343 individuals completed OncoLife surveys. Lung cancer survivors comprised 4% (n=142), with a median age at diagnosis of 57 years and median current age of 59 years. Lung cancer survivors were 50% male and 83% Caucasian. Chemotherapy was used in the treatment of 78% of patients with lung cancer, radiation was used in 58%, and surgery was used in 38%. Most lung cancer survivors (62%) reported receiving follow-up care from only an oncologist, while 27% reported being monitored by a primary care provider (PCP) and an oncologist, and 6% saw only a PCP. Only 11% reported receiving survivorship information at the conclusion of therapy. CONCLUSION: OncoLife represents the first Web-based program for the creation of survivorship care plans, and lung cancer survivors appear willing to use this type of tool. Most have received multimodality care, placing them at risk for treatment-related late effects. Most survivors do not report receiving routine care from a PCP, so attention to survivor healthcare needs by the oncology community is particularly important.

Hooker, L. (2009). "Commentary to "policy and practice in teenage and young adult

cancer care in England: looking to the future"." European Journal of Oncology Nursing 13(3): 154-155.

Houlihan, N. G. (2009). "Transitioning to cancer survivorship: plans of care." Oncology (Williston Park) 23(8 Suppl): 42-48.

Survivorship care plans have received increasing attention since the 2006 release of the Institute of Medicine report, From Cancer Patient to Cancer Survivor: Lost in Transition. The report strongly recommends that at completion of cancer treatment, clinicians provide patients with a summary of treatment delivered and a detailed plan of ongoing care, including follow-up schedules for visits and testing, as well as recommendations for early detection and management of treatment-related effects and other health problems. Templates have been developed by various groups to support the effort involved in complying with this recommendation. Barriers exist, such as difficulties in accessing information, preparation time involved for busy clinicians, lack of third-party reimbursement, and absence of clear guidelines for follow-up care after cancer treatment. The absence of research related to care plans and patient outcomes also calls their necessity into question. Yet, there is a growing acceptance among oncology physicians and nurses that having a plan of care is an essential component of quality survivorship care. [References: 19]

Huyghe, E., P. Martinetti, et al. (2009). "Banking on Fatherhood: pilot studies of a computerized educational tool on sperm banking before cancer treatment." Psycho-Oncology 18(9): 1011-1014.

OBJECTIVES: We conducted pilot studies of the feasibility and efficacy of an interactive, computerized educational tool, Banking on Fatherhood (BOF). METHODS: Two small randomized trials were conducted, with 20 male cancer patients eligible to bank sperm in Study 1 and 19 oncology fellows or residents in Study 2. In each trial, half of the subjects viewed BOF before completing questionnaires, and half viewed it afterward. Outcome measures included a knowledge test in both trials and a Decisional Conflict scale in the patient trial. All participants, plus a panel of 10 experts, ultimately viewed BOF and completed a form evaluating its usability and value. RESULTS: Patients who completed questionnaires after viewing BOF had significantly less decisional conflict about banking sperm than those who had not viewed it (P=0.0065), but knowledge scores were not significantly different between groups. Physicians who filled out questionnaires after viewing BOF scored significantly higher on the knowledge test (P<0.006). Patients, physicians and experts rated BOF as easy to use, informative and addressing important psychosocial concerns, with videos and animations adding to the value of the educational tool. CONCLUSION: Pilot studies suggest that BOF is a feasible intervention that could enhance decisions about sperm banking. Research with larger groups is needed to validate its effectiveness.

Imrt Documentation Working Group, T. Holmes, et al. (2009). "American Society of Radiation Oncology recommendations for documenting intensity-modulated radiation

therapy treatments." International Journal of Radiation Oncology, Biology, Physics 74(5): 1311-1318.

Despite the widespread use of intensity-modulated radiation therapy (IMRT) for approximately a decade, a lack of adequate guidelines for documenting these treatments persists. Proper IMRT treatment documentation is necessary for accurate reconstruction of prior treatments when a patient presents with a marginal recurrence. This is especially crucial when the follow-up care is managed at a second treatment facility not involved in the initial IMRT treatment. To address this issue, an American Society for Radiation Oncology (ASTRO) workgroup within the American ASTRO Radiation Physics Committee was formed at the request of the ASTRO Research Council to develop a set of recommendations for documenting IMRT treatments. This document provides a set of comprehensive recommendations for documenting IMRT treatments, as well as image-guidance procedures, with example forms provided.

Irwin, M., J. R. Klemp, et al. (2011). "Oncology nurses' perspectives on the state of cancer survivorship care: current practice and barriers to implementation." Oncology Nursing Forum 38(1): E11-19.

PURPOSE/OBJECTIVES: to describe current survivorship care from the perspectives of oncology nurses. DESIGN: descriptive. SETTING: e-mail invitation to Web-based survey. SAMPLE: 399 Oncology Nursing Society members providing care for patients initially treated more than one year previously. METHODS: an online survey was used to evaluate current aspects of survivorship care. MAIN RESEARCH VARIABLES: practice settings, services provided, and barriers to delivering survivorship care. FINDINGS: few nurses (27%) worked in settings with a formal survivorship program. Several program components were provided significantly more often in outpatient settings, pediatric facilities, and workplaces with a formal survivorship program. At the transition from acute to follow-up care, the survivorship nursing care provided most often was scheduling for ongoing monitoring (71%) and the least likely was assistance for employment or legal issues (16%). The greatest barriers to providing survivorship care were lack of time and funding (46%). Among nurses new to oncology (fewer than five years), 49% indicated they lacked sufficient knowledge compared to 36% of nurses with more than five years of oncology experience. CONCLUSIONS: findings describe current aspects of survivorship care across practice settings. Nurses reported that the greatest barriers are lack of time, funding, and lack of knowledge about survivorship issues. IMPLICATIONS FOR NURSING: a need exists for education to enhance knowledge and skills of nurses who will provide survivorship care. Research is warranted to develop empirically supported guidelines and care-delivery models that address the barriers to providing survivorship services.

Jacobs, L. A., S. C. Palmer, et al. (2009). "Adult cancer survivorship: evolution, research, and planning care." CA: a Cancer Journal for Clinicians 59(6): 391-410.

Increases in the number of adult cancer survivors and other issues have forced the oncology community to examine, evaluate, and alter the cancer care

paradigm. Pediatric oncologists are grappling with the task of transitioning a growing population of adult survivors of childhood cancer to adult medicine, while oncologists caring for adult cancer survivors are seeking models of follow-up care that are acceptable to patients and providers. Workforce and access-to-care issues suggest that primary care providers will see more cancer survivors in their practices across time, although it is unclear how prepared they are for this task. Translational research is needed to develop evidence-based clinical care and survivorship care plans. A broad picture of the evolving field of adult cancer survivorship is presented. The recent focus on young adult survivors of childhood cancer, an overview of translational research needed to inform the physical and psychosocial care of cancer survivors, and the roles of primary and specialty care providers managing this population is examined. Finally, an overview of evolving treatment summary and care plan initiatives is presented.

Jacobson, J. O., M. N. Neuss, et al. (2008). "Improvement in oncology practice performance through voluntary participation in the Quality Oncology Practice Initiative." Journal of Clinical Oncology 26(11): 1893-1898.

PURPOSE: The Quality Oncology Practice Initiative (QOPI) became available to all American Society of Clinical Oncology member physicians in 2006 as a voluntary medical oncology practice-based quality measurement and improvement project. QOPI assesses practice performance for a series of evidence- and consensus-based process measures, relying on practices to complete structured chart reviews and submit data via a secure Web-based portal. METHODS: This analysis focused on the 71 practices that participated in both the March and September 2006 data collections (7,624 charts abstracted in March and 10,240 in September). Among 33 measures common to both collections, five measures were closely correlated, and 28 are included in the final analysis. Composite scores were created for six different domains of care. Statistical significance was tested on both absolute changes and relative changes (relative failure reduction) of quality measures from baseline to follow-up and between the lower quartile and all other quartiles. RESULTS: Practice performance on individual measures varied between 18.8% and 98.6%. Mean overall performance as measured by a composite score increased from 78.7% in March to 82.3% in September ($P < .05$). Improvement was most marked among practices originally performing in the bottom quartile. Using a composite score, the absolute and relative performance for the bottom quartile improved by 27% and 35%, respectively, statistically superior to that of all others. CONCLUSION: Practices that participated in QOPI demonstrated improved performance in self-reported process measures, with the greatest improvement demonstrated in initially low-performing practices.

Jarman, I. H., T. A. Etchells, et al. (2008). "An integrated framework for risk profiling of breast cancer patients following surgery." Artificial Intelligence in Medicine 42(3): 165-188.

OBJECTIVE: An integrated decision support framework is proposed for clinical oncologists making prognostic assessments of patients with operable breast

cancer. The framework may be delivered over a web interface. It comprises a triangulation of prognostic modelling, visualisation of historical patient data and an explanatory facility to interpret risk group assignments using empirically derived Boolean rules expressed directly in clinical terms. METHODS AND MATERIALS: The prognostic inferences in the interface are validated in a multicentre longitudinal cohort study by modelling retrospective data from 917 patients recruited at Christie Hospital, Wilmslow between 1983 and 1989 and predicting for 931 patients recruited in the same centre during 1990-1993. There were also 291 patients recruited between 1984 and 1998 at the Clatterbridge Centre for Oncology and the Linda McCartney Centre, Liverpool, UK. RESULTS AND CONCLUSIONS: There are three novel contributions relating this paper to breast cancer cases. First, the widely used Nottingham prognostic index (NPI) is enhanced with additional clinical features from which prognostic assessments can be made more specific for patients in need of adjuvant treatment. This is shown with a cross matching of the NPI and a new prognostic index which also provides a two-dimensional visualisation of the complete patient database by risk of negative outcome. Second, a principled rule-extraction method, orthogonal search rule extraction, generates readily interpretable explanations of risk group allocations derived from a partial logistic artificial neural network with automatic relevance determination (PLANN-ARD). Third, 95% confidence intervals for individual predictions of survival are obtained by Monte Carlo sampling from the PLANN-ARD model.

Jazieh, A. R., H. A. Azim, et al. (2010). "The process of NCCN guidelines adaptation to the Middle East and North Africa region." Journal of the National Comprehensive Cancer Network 8 Suppl 3: S5-7.

The NCCN developed clinical practice guidelines for oncology that set the standard of cancer care in the United States. Because of wide acceptance of, need for, and interest in standardized treatment practices across the world, NCCN launched initiatives to help international groups adapt these guidelines. This article describes the initiative in the Middle East and North Africa (MENA) region. A group of oncology experts and key opinion leaders were assembled into 7 specific committees to develop treatment guidelines for breast cancer, lung cancer, colon cancer, prostate cancer, hepatobiliary cancer, lymphoma, and palliative care. The committees reviewed the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) to identify any modifications required for them to be more applicable to the MENA region based on available evidence and regional experience. These modifications were discussed with NCCN experts and summarized for each specific area. The development of these guidelines generated a strong interest in the region to develop more evidence-based practice and create further networking and collaboration.

Johnstone, P. A., T. Crenshaw, et al. (2008). "Automated data mining of a proprietary database system for physician quality improvement." International Journal of Radiation Oncology, Biology, Physics 70(5): 1537-1541.

PURPOSE: Physician practice quality improvement is a subject of intense

national debate. This report describes using a software data acquisition program to mine an existing, commonly used proprietary radiation oncology database to assess physician performance. METHODS AND MATERIALS: Between 2003 and 2004, a manual analysis was performed of electronic portal image (EPI) review records. Custom software was recently developed to mine the record-and-verify database and the review process of EPI at our institution. In late 2006, a report was developed that allowed for immediate review of physician completeness and speed of EPI review for any prescribed period. RESULTS: The software extracted >46,000 EPIs between 2003 and 2007, providing EPI review status and time to review by each physician. Between 2003 and 2007, the department EPI review improved from 77% to 97% (range, 85.4-100%), with a decrease in the mean time to review from 4.2 days to 2.4 days. The initial intervention in 2003 to 2004 was moderately successful in changing the EPI review patterns; it was not repeated because of the time required to perform it. However, the implementation in 2006 of the automated review tool yielded a profound change in practice. Using the software, the automated chart review required approximately 1.5 h for mining and extracting the data for the 4-year period. CONCLUSION: This study quantified the EPI review process as it evolved during a 4-year period at our institution and found that automation of data retrieval and review simplified and facilitated physician quality improvement.

Joseph, K. J., Z. Al-Mandhari, et al. (2008). "Reirradiation after radical radiation therapy: a survey of patterns of practice among Canadian radiation oncologists." International Journal of Radiation Oncology, Biology, Physics 72(5): 1523-1529.

PURPOSE: The objective of this study was to survey the use of reirradiation (Re-RT) for in-field failures after previous radical radiation treatment (RT) among Canadian radiation oncologists (ROs). METHODS AND MATERIALS: An electronic survey was sent to 271 ROs in Canada. The completed surveys were received electronically via e-mail and the data were analyzed using SAS 9.1.3 software. RESULTS: A total of 183 ROs (67.5%) completed and returned the survey. The majority of the respondents were involved in the practice of either breast (48%) or genitourinary (43%) tumor sites. A total of 49% of the participants were interested in using Re-RT for the management of in-field recurrences. The goals of the therapy would be improvement of quality of life (99%), locoregional control (80%), or cure (32%). Most of the physicians believed that patients should have a minimum Karnofsky performance status of 50 or Eastern Cooperative Oncology Group performance status of 3, a minimum life expectancy of 3 months, and a minimum interval from initial treatment of 3 months if Re-RT were to be given with curative intent. CONCLUSIONS: This survey showed that a wide variation existed among ROs in their approach to Re-RT. Newer technologies in RT planning and delivery would be employed to facilitate normal tissue avoidance. The results of this study suggested that a consensus meeting was needed to establish guidelines for the practice and prospective evaluation of Re-RT.

Kaasa, S., J. H. Loge, et al. (2008). "Symptom assessment in palliative care: a need for

international collaboration." Journal of Clinical Oncology 26(23): 3867-3873.

This article describes the research strategy for the development of a computerized assessment tool as part of a European Union (EU)-funded project, the European Palliative Care Research Collaborative (EPCRC). The EPCRC is funded through the Sixth Framework Program of the EU with major objectives to develop a computer-based assessment and classification tool for pain, depression, and cachexia. A systematic approach will be applied for the tool development with emphasis on multicultural and multilanguage challenges across Europe. The EPCRC is based on a long lasting collaboration within the European Association for Palliative Care Research Network. The ongoing change in society towards greatly increased use of communication as well as information transfer via digital systems will rapidly change the health care system. Therefore, patient-centered outcome assessment tools applicable for both clinic and research should be developed. Report of symptoms via digital media provides a start for face-to-face communication, treatment decisions, and assessment of treatment effects. The increased use of electronic media for exchange of information may facilitate the development and use of electronic assessment tools and decision-making systems in oncology. In the future, patients may find that a combination of a face-to-face interview plus a transfer of information of subjective symptoms by electronic means will optimize treatment. [References: 47]

Kamo, N., S. V. Dandapani, et al. (2010). "Evaluation of the SCA instrument for measuring patient satisfaction with cancer care administered via paper or via the Internet." Annals of Oncology 22(3): 723-729.

BACKGROUND: Patients' perspectives provide valuable information on quality of care. This study evaluates the feasibility and validity of Internet administration of Service Satisfaction Scale for Cancer Care (SCA) to assess patient satisfaction with outcome, practitioner manner/skill, information, and waiting/access. PATIENTS AND METHODS: Primary data collected from November 2007 to April 2008. Patients receiving cancer care within 1 year were recruited from oncology, surgery, and radiation clinics at a tertiary care hospital. An Internet-based version of the 16-item SCA was developed. Participants were randomised to Internet SCA followed by paper SCA 2 weeks later or vice versa. Seven-point Likert scale responses were converted to a 0-100 scale (minimum-maximum satisfaction). Response distribution, Cronbach's alpha, and test-retest correlations were calculated. RESULTS: Among 122 consenting participants, 78 responded to initial SCA. Mean satisfaction scores for paper/Internet were 91/90 (outcome), 95/94 (practitioner manner/skill), 89/90 (information), and 86/86 (waiting/access). Response rate and item missingness were similar for Internet and paper. Except for practitioner manner/skill, test-retest correlations were robust r = 0.77 (outcome), 0.74 (information), and 0.75 (waiting/access) (all $P < 0.001$). CONCLUSIONS: Internet SCA administration is a feasible and a valid measurement of cancer care satisfaction for a wide range of cancer diagnoses, treatment modalities, and clinic settings.

Kang, J. H., J. J. Wilkens, et al. (2008). "Non-uniform depth scanning for proton therapy systems employing active energy variation." Physics in Medicine & Biology 53(9): N149-155.

In proton scanning systems that employ active energy variation for depth modulation, a switch of the particle energy might typically require 1-2 s. For plans comprising many energy slices, these seconds could sum up to a non-negligible fraction of the total treatment duration. We have applied the Nyquist-Shannon sampling theorem to determine an efficient spatial arrangement of Bragg peaks in a target volume. This pre-determined schedule of increasing energy spacing with higher energy allows us to reduce the number of used energy slices without compromising the physical dosimetric quality of a plan. Our results suggest that the advantage of such a simple implementation would be especially significant for larger, deep-seated tumors such as the prostate; the number of energy slices was cut by a factor of 2-6.

Keil, S., F. F. Behrendt, et al. (2009). "RECIST and WHO criteria evaluation of cervical, thoracic and abdominal lymph nodes in patients with malignant lymphoma: manual versus semi-automated measurement on standard MDCT slices." Rofo: Fortschritte auf dem Gebiete der Rontgenstrahlen und der Nuklearmedizin 181(9): 888-895.

PURPOSE: Since semi-automated lesion quantification may be more precise than manual uni- and bidimensional measurements, the purpose of this study was to compare semi-automated with manual evaluations of cervical, thoracic and abdominal lymph nodes in patients with malignant lymphoma. MATERIALS AND METHODS: 62 patients with known malignant lymphoma underwent staging with contrast-enhanced 16-MDCT (16x0.7 mm coll., 120 kV, cervical/thoracic/abdominal: 150/120/160 mAseff., 1/1.25 /1 pitch, 4/3 - 5/4 - 5/4 slice thickness/reconstruction increment). On the basis of these standard reconstructed slices, each lesion was quantified in terms of RECIST and its longest orthographic diameter using a semi-automated software tool (Syngo CT Oncology, Siemens Medical Solutions, Forchheim, Germany) and manually by an experienced radiologist. The degree of agreement between manual measurements and software quantification was statistically assessed by computing the concordance correlation coefficient kappa and represented graphically in corresponding Bland-Altman plots. RESULTS: 74/80 cervical, 51/80 thoracic and 75/80 abdominal lymph nodes were correctly evaluated by the software. A strong degree of agreement between both measurement techniques (RECIST diameter: kappa = 0.97 (cervical)/0.98 (thoracic)/0.99 (abdominal); longest orthographic diameter: kappa = 0.97/0.93/0.97) was obtained. CONCLUSION: Semi-automated measurement of cervical, thoracic and abdominal lymph nodes showed valid results on standard axial reconstructions compared to manual quantification with the limitation of a high false segmentation rate in thoracic lymph nodes. Georg Thieme Verlag KG Stuttgart, New York.

Keil, S., P. Bruners, et al. (2010). "Radiofrequency ablation of liver metastases-software-assisted evaluation of the ablation zone in MDCT: tumor-free follow-up versus

local recurrent disease." Cardiovascular & Interventional Radiology 33(2): 297-306.

The purpose of this study was to investigate differences in change of size and CT value between local recurrences and tumor-free areas after CT-guided radiofrequency ablation (RFA) of hepatic metastases during follow-up by means of dedicated software for automatic evaluation of hepatic lesions. Thirty-two patients with 54 liver metastases from breast or colorectal cancer underwent triphasic contrast-enhanced multidetector-row computed tomography (MDCT) to evaluate hepatic metastatic spread and localization before CT-guided RFA and for follow-up after intervention. Sixteen of these patients (65.1 + or - 10.3 years) with 30 metastases stayed tumor-free (group 1), while the other group (n = 16 with 24 metastases; 62.0 + or - 13.8 years) suffered from local recurrent disease (group 2). Applying an automated software tool (SyngoCT Oncology; Siemens Healthcare, Forchheim, Germany), size parameters (volume, RECIST, WHO) and attenuation were measured within the lesions before, 1 day after, and 28 days after RFA treatment. The natural logarithm (ln) of the quotient of the volume 1 day versus 28 days after RFA treament was computed: lnQ1//28/0(volume). Analogously, ln ratios of RECIST, WHO, and attenuation were computed and statistically evaluated by repeated-measures ANOVA. One lesion in group 2 was excluded from further evaluation due to automated missegmentation. Statistically significant differences between the two groups were observed with respect to initial volume, RECIST, and WHO ($p < 0.05$). Furthermore, ln ratios corresponding to volume, RECIST, and WHO differed significantly between the two groups. Attenuation evaluations showed no significant differences, but there was a trend toward attenuation assessment for the parameter lnQ28/0(attenuation) ($p = 0.0527$), showing higher values for group 1 (-0.4 + or - 0.3) compared to group 2 (-0.2 + or - 0.2). In conclusion, hepatic metastases and their zone of coagulation necrosis after RFA differed significantly between tumor-free and local-recurrent ablation zones with respect to the corresponding size parameters. A new parameter (lnQ1//28/0(volume/RECIST/WHO/attenuation)) was introduced, which appears to be of prognostic value at early follow-up CT.

Kelly, D. and F. Gibson (2009). "Meeting the needs of young people with cancer: a lesson in change." European Journal of Oncology Nursing 13(3): 147-148.

Kennedy, S., J. Seymour, et al. (2009). "Key stakeholders' experiences and views of the NHS End of Life Care Programme: findings from a national evaluation." Palliative Medicine 23(4): 283-294.

This article reports on the qualitative interview component of a national evaluation of the NHS End of Life Care Programme. It describes and discusses the views and experiences of 37 stakeholders of the Programme in relation to its development and implementation, impact and sustainability. The sample comprises individuals holding different roles in, and contrasting views and experiences of the Programme, and from various locations in England. Overall, the aims, approach and impact of the Programme were described positively, although concerns about achieving sustainability were widespread. The extent of support for the Programme's primary aim to extend and improve end of life care,

and the contribution of the hardworking and skilled individuals involved with its implementation, were highlighted as key influences on its successes. The authors conclude that many of the views and experiences highlighted in the stakeholder enquiry are reflected in the development and detail of the recently announced End of Life Care Strategy.

Khorana, A. A., M. Shayne, et al. (2011). "Can literature enhance oncology training? A pilot humanities curriculum." Journal of Clinical Oncology 29(4): 468-471.

Kieviet-Stijnen, A., A. Visser, et al. (2008). "Mindfulness-based stress reduction training for oncology patients: patients' appraisal and changes in well-being." Patient Education & Counseling 72(3): 436-442.

OBJECTIVE: This study explores satisfaction and changes in well-being in cancer patients following mindfulness-based stress reduction training. METHOD: Data were collected in 47 cancer patients before and after the training, and also 1 year later. Standardized questionnaires were used to measure quality of life, joy in life, mood disturbances (depression, anger, vigor, fatigue, and tension), meaning in life and physical symptoms. RESULTS: Participants were highly satisfied and said they had reached their goals with the training. The results show that directly after the training patients reported a better quality of life, more joy in life, less tension, and fewer physical symptoms. These effects appeared even stronger at follow-up. A year after the training a decrease was also found in depression, anger, vigor and total mood disturbance. No changes could be established for meaning in life and fatigue. Effect sizes varied between 0.28 and 0.60, indicating small-to-moderate changes. CONCLUSION: Mindfulness training potentially supports cancer patients in handling the stress due to their life-threatening disease and increases their well-being. Several suggestions for further research are discussed. PRACTICE IMPLICATIONS: Mindfulness training provides cancer patients with tools to deal with their limitations and worries, both during and after their treatment.

Klimov, D., Y. Shahar, et al. (2010). "Intelligent visualization and exploration of time-oriented data of multiple patients." Artificial Intelligence in Medicine 49(1): 11-31.

OBJECTIVE: Clinicians and medical researchers alike require useful, intuitive, and intelligent tools to process large amounts of time-oriented multiple-patient data from multiple sources. For analyzing the results of clinical trials or for quality assessment purposes, an aggregated view of a group of patients is often required. To meet this need, we designed and developed the VISualizatIon of Time-Oriented RecordS (VISITORS) system, which combines intelligent temporal analysis and information visualization techniques. The VISITORS system includes tools for intelligent retrieval, visualization, exploration, and analysis of raw time-oriented data and derived (abstracted) concepts for multiple patient records. To derive meaningful interpretations from raw time-oriented data (known as temporal abstractions), we used the knowledge-based temporal-abstraction method. METHODS: The main module of the VISITORS system is an interactive, ontology-based exploration module, which enables the user to visualize raw data

and abstract (derived) concepts for multiple patient records, at several levels of temporal granularity; to explore these concepts; and to display associations among raw and abstract concepts. A knowledge-based delegate function is used to convert multiple data points into one delegate value representing each temporal granule. To select the population of patients to explore, the VISITORS system includes an ontology-based temporal-aggregation specification language and a graphical expression-specification module. The expressions, applied by an external temporal mediator, retrieve a list of patients, a list of relevant time intervals, and a list of time-oriented patients' data sets, by using an expressive set of time and value constraints. RESULTS: Functionality and usability evaluation of the interactive exploration module was performed on a database of more than 1000 oncology patients by a group of 10 users-five clinicians and five medical informaticians. Both types of users were able in a short time (mean of 2.5+/-0.2min per question) to answer a set of clinical questions, including questions that require the use of specialized operators for finding associations among derived temporal abstractions, with high accuracy (mean of 98.7+/-2.4 on a predefined scale from 0 to 100). There were no significant differences between the response times and between accuracy levels of the exploration of the data using different time lines, i.e., absolute (i.e., calendrical) versus relative (referring to some clinical key event). A system usability scale (SUS) questionnaire filled out by the users demonstrated the VISITORS system to be usable (mean score for the overall group: 69.3), but the clinicians' usability assessment was significantly lower than that of the medical informaticians. CONCLUSIONS: We conclude that intelligent visualization and exploration of longitudinal data of multiple patients with the VISITORS system is feasible, functional, and usable. 2010 Elsevier B.V. All rights reserved.

Koczwara, B., K. Francis, et al. (2010). "Reaching further with online education? The development of an effective online program in palliative oncology." Journal of Cancer Education 25(3): 317-323.

Patients in rural and remote Australia have less access to specialist oncology services and rely more on local health professionals for provision of cancer care. We have developed a 7.5-h online educational program on palliative oncology for health professionals focused on the needs of rural providers. There were 501 active (enrolled) users and 268 ad hoc (non-enrolled) users, with 90 completing evaluation. Eighty-two (91%) indicated that their learning needs were partially or entirely met. Sixty-five (75%) respondents planned to review or change their practice as a result. The online program is effective in meeting learning needs of Australian health providers, reaching high numbers with high acceptability.

Kotoula, V., E. Charalambous, et al. (2009). "Targeted KRAS mutation assessment on patient tumor histologic material in real time diagnostics." PLoS ONE [Electronic Resource] 4(11): e7746.

BACKGROUND: Testing for tumor specific mutations on routine formalin-fixed paraffin-embedded (FFPE) tissues may predict response to treatment in Medical Oncology and has already entered diagnostics, with KRAS mutation assessment

as a paradigm. The highly sensitive real time PCR (Q-PCR) methods developed for this purpose are usually standardized under optimal template conditions. In routine diagnostics, however, suboptimal templates pose the challenge. Herein, we addressed the applicability of sequencing and two Q-PCR methods on prospectively assessed diagnostic cases for KRAS mutations. METHODOLOGY/PRINCIPAL FINDINGS: Tumor FFPE-DNA from 135 diagnostic and 75 low-quality control samples was obtained upon macrodissection, tested for fragmentation and assessed for KRAS mutations with dideoxy-sequencing and with two Q-PCR methods (Taqman-minor-groove-binder [TMGB] probes and DxS-KRAS-IVD). Samples with relatively well preserved DNA could be accurately analyzed with sequencing, while Q-PCR methods yielded informative results even in cases with very fragmented DNA ($p<0.0001$) with 100% sensitivity and specificity vs each other. However, Q-PCR efficiency (Ct values) also depended on DNA-fragmentation ($p<0.0001$). Q-PCR methods were sensitive to detect<or=1% mutant cells, provided that samples yielded cycle thresholds (Ct)<29, but this condition was met in only 38.5% of diagnostic samples. In comparison, FFPE samples (>99%) could accurately be analyzed at a sensitivity level of 10% (external validation of TMGB results). DNA quality and tumor cell content were the main reasons for discrepant sequencing/Q-PCR results (1.5%). CONCLUSIONS/SIGNIFICANCE: Diagnostic targeted mutation assessment on FFPE-DNA is very efficient with Q-PCR methods in comparison to dideoxy-sequencing. However, DNA fragmentation/amplification capacity and tumor DNA content must be considered for the interpretation of Q-PCR results in order to provide accurate information for clinical decision making.

Krallinger, M., F. Leitner, et al. (2010). "Analysis of biological processes and diseases using text mining approaches." Methods in Molecular Biology 593: 341-382.

A number of biomedical text mining systems have been developed to extract biologically relevant information directly from the literature, complementing bioinformatics methods in the analysis of experimentally generated data. We provide a short overview of the general characteristics of natural language data, existing biomedical literature databases, and lexical resources relevant in the context of biomedical text mining. A selected number of practically useful systems are introduced together with the type of user queries supported and the results they generate. The extraction of biological relationships, such as protein-protein interactions as well as metabolic and signaling pathways using information extraction systems, will be discussed through example cases of cancer-relevant proteins. Basic strategies for detecting associations of genes to diseases together with literature mining of mutations, SNPs, and epigenetic information (methylation) are described. We provide an overview of disease-centric and gene-centric literature mining methods for linking genes to phenotypic and genotypic aspects. Moreover, we discuss recent efforts for finding biomarkers through text mining and for gene list analysis and prioritization. Some relevant issues for implementing a customized biomedical text mining system will be pointed out. To demonstrate the usefulness of literature mining for the molecular oncology domain, we implemented two cancer-related applications.

The first tool consists of a literature mining system for retrieving human mutations together with supporting articles. Specific gene mutations are linked to a set of predefined cancer types. The second application consists of a text categorization system supporting breast cancer-specific literature search and document-based breast cancer gene ranking. Future trends in text mining emphasize the importance of community efforts such as the BioCreative challenge for the development and integration of multiple systems into a common platform provided by the BioCreative Metaserver. [References: 111]

Kristensen, I., J. Lindh, et al. (2009). "Telemedicine as a tool for sharing competence in paediatric radiotherapy: implementation and initial experiences from a Swedish project." Acta Oncologica 48(1): 146-152.

Kroenke, K., D. Theobald, et al. (2010). "Effect of telecare management on pain and depression in patients with cancer: a randomized trial." JAMA 304(2): 163-171.

CONTEXT: Pain and depression are 2 of the most prevalent and treatable cancer-related symptoms, yet they frequently go unrecognized, undertreated, or both. OBJECTIVE: To determine whether centralized telephone-based care management coupled with automated symptom monitoring can improve depression and pain in patients with cancer. DESIGN, SETTING, AND PATIENTS: Randomized controlled trial conducted in 16 community-based urban and rural oncology practices involved in the Indiana Cancer Pain and Depression (INCPAD) trial. Recruitment occurred from March 2006 through August 2008 and follow-up concluded in August 2009. The participating patients had depression (Patient Health Questionnaire-9 score > or = 10), cancer-related pain (Brief Pain Inventory [BPI] worst pain score > or = 6), or both. INTERVENTION: The 202 patients randomly assigned to receive the intervention and 203 to receive usual care were stratified by symptom type. Patients in the intervention group received centralized telecare management by a nurse-physician specialist team coupled with automated home-based symptom monitoring by interactive voice recording or Internet. MAIN OUTCOME MEASURES: Blinded assessment at baseline and at months 1, 3, 6, and 12 for depression (20-item Hopkins Symptom Checklist [HSCL-20]) and pain (BPI) severity. RESULTS: Of the 405 participants enrolled in the study, 131 had depression only, 96 had pain only, and 178 had both depression and pain. Of the 274 patients with pain, 137 patients in the intervention group had greater improvements in BPI pain severity over the 12 months of the trial whether measured as a continuous severity score or as a categorical pain responder (> or = 30% decrease in BPI) than the 137 patients in the usual-care group (P < .001 for both). Similarly, of the 309 patients with depression, the 154 patients in the intervention group had greater improvements in HSCL-20 depression severity over the 12 months of the trial whether measured as a continuous severity score or as a categorical depression responder (> or = 50% decrease in HSCL) than the 155 patients in the usual care group (P < .001 for both). The standardized effect size for between-group differences at 3 and 12 months was 0.67 (95% confidence interval [CI], 0.33-1.02) and 0.39 (95% CI, 0.01-0.77) for pain, and 0.42 (95% CI, 0.16-0.69) and

0.41 (95% CI, 0.08-0.72) for depression. CONCLUSION: Centralized telecare management coupled with automated symptom monitoring resulted in improved pain and depression outcomes in cancer patients receiving care in geographically dispersed urban and rural oncology practices. TRIAL REGISTRATION: clinicaltrials.gov Identifier: NCT00313573.

Kyei, M., E. Lavelle, et al. (2010). "Triaging referrals as part of hematology/oncology fellowship training." Journal of Cancer Education 25(3): 437-441.

We developed an integrative component of the consult rotation for fellows training in hematology/oncology. This component consisted of triaging all consults to the hematology/oncology service of the CAVHS during a 1-year period of time. The goals of the rotation were to improve timeliness of response to consultation requests, to gain experience in differential diagnosis of patients with potential hematologic/oncologic disorders through of such patients, review of decisions with attending physicians, and communication of such with the referring physician. The major benefits were that fellows integrated didactic learning into real-life clinical cases, selected patients for their continuity clinic to assure sufficient variety and complexity of cases, honed their communication skills, learned about referring and attending physicians' styles, and gained practice in clinical vignettes representative of cases they would be expected to see in clinical practice. Disadvantages were time involvement (approximately 2 h/day) and risks of over- or under-referrals. Administratively, there was a significant decline in the wait time for patients to be seen in the hematology/oncology service. In all, this elective is a valuable integrative experience of senior fellows, but may have less value for first year fellows.

Langewitz, W., L. Heydrich, et al. (2010). "Swiss Cancer League communication skills training programme for oncology nurses: an evaluation." Journal of Advanced Nursing 66(10): 2266-2277.

AIM: This paper is a report of an evaluation of the effectiveness of a communication skills training programme for oncology nurses. BACKGROUND: Clinical care for patients with cancer is increasingly being divided between nurses and physicians, with nurses being responsible for the continuity of patient care, and oncologists choosing and explaining the basics of anti-cancer therapy. Therefore, oncology nurses will profit from evidence-based communication skills training to allow them to perform in a professional way. METHODS: Between 2003 and 2006 pre- and post-intervention videos of interviews with simulated patients were compared using the Roter Interaction Analysis System. Patient centeredness was assessed by counting segments of appropriate mutual responding to cues and by calculating length of uninterrupted patient speech. FINDINGS: Appropriate empathic (1.6% vs. 3.2%), reassuring statements (2.3% vs. 3.4%), questions concerning psychosocial information (2.8% vs. 4.0%) increased statistically significantly; utterances containing medical information decreased on the part of nurses (17.8% vs. 13.3%) and patients (8.1% vs. 6.7%); and patients provided more psychosocial information (3.3% vs. 5.7%). The level of congruence and empathic responses to patients' emotional cues increased

statistically significantly, as did the length of uninterrupted speech (3.7-4.3 utterances; all P < 0.05). CONCLUSION: The communication skills training of the Swiss Cancer League could be used as a model to achieve substantial improvements in patient-centred communication. Sequence analysis of utterances from patient-provider interaction should be used to assess the amount of patient-centred talk. Copyright 2010 The Authors. Journal of Advanced Nursing Copyright 2010 Blackwell Publishing Ltd.

Langmack, K., A. Thomas, et al. (2008). "The use of a commercial remote desktop program in the delineation of target volumes in radiotherapy." British Journal of Radiology 81(968): 666-667.

Recent guidance from the Royal College of Radiologists suggests that there should be close collaboration between oncologists and radiologists in target volume determination. However, the guidance also states that there may be practical difficulties in achieving this. To ameliorate some of these difficulties, we have implemented a readily available remote desktop package, Microsoft NetMeeting, in conjunction with a commercial virtual simulation package, ProSoma. This allows radiologists to conference easily with oncologists on a particular patient, as the full functionality of the virtual simulator is available simultaneously to both parties. We have found that this solution is eminently practical and increases the amount of interaction between oncologists and radiologists during target volume definition.

Larholt, K., C. L. Pashos, et al. (2008). "Dosing and Outcomes Study of Erythropoiesis-Stimulating Therapies (DOSE) : a registry for characterizing anaemia management and outcomes in oncology patients." Clinical Drug Investigation 28(3): 159-167.

BACKGROUND AND OBJECTIVE: To report the design, methodology, implementation and initial results of the Dosing and Outcomes Study of Erythropoiesis-Stimulating Therapies (DOSE) Registry, the first US patient registry to collect and report on practice patterns and outcomes associated with erythropoiesis-stimulating therapy (EST) for anaemia management in oncology patients. METHODS: DOSE is a prospective ongoing registry of oncology patients treated with epoetin-alpha or darbepoetin-alpha. Patients from either community or academic centres who meet prespecified entry criteria are eligible for inclusion in the registry. Data collected include patient demographic and clinical characteristics, EST administration, haematological parameters, patient-reported outcomes and medical resource utilization. Patients are followed from EST initiation through to the end of therapy or 16 weeks, whichever is earlier. RESULTS: Initial results from 45 sites for 861 patients (epoetin-alpha, n = 312; darbepoetin-alpha, n = 549) showed that baseline demographic and disease characteristics were similar between the two treatment groups. Administration of EST at both weekly and > or =2-weekly intervals was observed in both groups, with similar numbers of haemoglobin determinations. However, the mean number of office visits was higher in the darbepoetin-alpha group despite more frequent administration of therapy at > or =2-weekly intervals in this group. Mean treatment duration was approximately 8 weeks for both groups. Mean post-

baseline haemoglobin levels of 11-12 g/dL were achieved and maintained at all timepoints assessed with epoetin-alpha but not with darbepoetin-alpha. Both groups had similar rates of packed red blood cell transfusions. CONCLUSIONS: The DOSE Registry is a valuable source of data relating to anaemia management, practice patterns and outcomes in oncology patients from the perspective of actual clinical practice. Results from this registry should provide patients, clinicians and healthcare decision makers with a better understanding of the relationship between EST dosage and outcomes in the clinical setting.

Lawrentschuk, N., R. Abouassaly, et al. (2009). "Health information quality on the internet in urological oncology: a multilingual longitudinal evaluation." Urology 74(5): 1058-1063.

OBJECTIVES: To compare the quality of uro-oncological Web sites, to assess for language or disease differences across Western languages, and to perform a longitudinal comparison between 2004 and 2009. Uro-oncological Internet information quality is considered variable but no comprehensive analysis exists. METHODS: Health on the Net (HON) principles may be applied to Web sites using an automated toolbar function. Using the Google search engine (http://www.Google.com), in 2004 and 2009, 2400 Web sites were assessed using the keywords prostate, bladder, kidney, and testicular cancer in English, French, German, and Spanish. The first 150 Web sites in each language had HON principles measured-a comparison between 2004 and 2009 was done. A further analysis of site sponsorship was undertaken. RESULTS: Regardless of language or cancer type, most sites are not HON accredited. English has consistently more than English, French, Spanish, or German. For the respective languages in 2009, prostate has the most (29, 14%, 16%, 12%), followed by bladder (29%, 22%, 14%, 13%), kidney (25%, 15%, 10%, 13%), and testis (26%, 19%, 7.11%). Significant differences were found comparing language and organ groups. The quality improved from 2004 to 2009. Nonprofit organizations (51%), government and/or educational (39%), commercial (20%), with urologists last (14%) were accredited. CONCLUSIONS: A lack of validation of most uro-oncological sites should be appreciated by urologists. Additionally, there is a discrepancy in quality and number of Web sites across uro-oncological diseases and major Western European languages, but with some improvement seen recently. We need to encourage informative, ethical, and reliable complimentary health Web sites on the Internet and direct patients to them.

Leigh, S. (2008). "Cancer survivorship: advocacy organizations and support systems." Hematology - Oncology Clinics of North America 22(2): 355-363.

When oncology evolved into a specialized field of medicine more than four decades ago, the primary goals of most cancer treatment included the extension of patients' life expectancies and the occasional hope for cure. Physicians were seen as the principal and solitary advocate for patients, and information regarding cancer diagnosis, treatment, and side effects was delivered or screened by a doctor. Patient education materials were scarce, formalized support systems were nonexistent, and the future was often difficult to define.

Patient advocacy has since expanded to models of self, organizational, and public policy advocacy. This article provides examples of advocacy organizations and support systems that offer guidance to providers and patients throughout the continuum of cancer care and into longer-term survival. [References: 2]

Leskosek, B. L. (2008). "A clinical research information system: an example of prospective observational study in oncology." AMIA Annual Symposium Proceedings/AMIA Symposium.: 1021.

The paper presents a web-based clinical research information system (RIS) used by physicians and pharmacists at Institute of Oncology, Ljubljana and its geographically remote partners to collect research clinical data for observational study. The RIS development was focused mainly on: formal electronic data collection with on-line data validation, computer data preparation for uniform analyses, user friendliness, security issues, low establishment and maintenance costs.

Levy, A. G., S. S. Sonnad, et al. (2008). "Making sense of cancer risk calculators on the web." Journal of General Internal Medicine 23(3): 229-235.

OBJECTIVE: Cancer risk calculators on the internet have the potential to provide users with valuable information about their individual cancer risk. However, the lack of oversight of these sites raises concerns about low quality and inconsistent information. These concerns led us to evaluate internet cancer risk calculators. DESIGN: After a systematic search to find all cancer risk calculators on the internet, we reviewed the content of each site for information that users should seek to evaluate the quality of a website. We then examined the consistency of the breast cancer risk calculators by having 27 women complete 10 of the breast cancer risk calculators for themselves. We also completed the breast cancer risk calculators for a hypothetical high- and low-risk woman, and compared the output to Surveillance Epidemiology and End Results estimates for the average same-age and same-race woman. RESULTS: Nineteen sites were found, 13 of which calculate breast cancer risk. Most sites do not provide the information users need to evaluate the legitimacy of a website. The breast cancer calculator sites vary in the risk factors they assess to calculate breast cancer risk, how they operationalize each risk factor and in the risk estimate they provide for the same individual. CONCLUSIONS: Internet cancer risk calculators have the potential to provide a public health benefit by educating individuals about their risks and potentially encouraging preventive health behaviors. However, our evaluation of internet calculators revealed several problems that call into question the accuracy of the information that they provide. This may lead the users of these sites to make inappropriate medical decisions on the basis of misinformation.

Lewison, G., S. Tootell, et al. (2008). "How do the media report cancer research? A study of the UK's BBC website." British Journal of Cancer 99(4): 569-576.

This study examined cancer research stories on the BBC web archive (July 1998-June 2006). There were about 260 BBC stories per year, of which about 170 were classed as relevant to reports of cancer research. The stories focused

heavily on breast cancer, and over one-third of them mentioned this (compared with a cancer disease burden of 13%); the next most covered sites were lung and prostate cancers, although the former was much less mentioned than its cancer disease burden of almost 20% would have suggested. The focus of the stories was often on new or improved drugs or vaccines (20% of stories), with lifestyle choices (12%), genetic developments (9%), and food and drink (8%) also featuring fairly prominently. The BBC stories cited about 1380 research papers that could be identified as journal articles. About three-quarters of the cited papers were in the field of cancer. The papers of these authors came from over 60 countries, and 40% were from the United Kingdom and 36% from the United States. UK cancer research was heavily overcited, by about 6:1, relative to its presence in world oncology research and US research was cited about in proportion. That of most other countries, especially Japan, Germany, and Austria, was relatively undercited. These cited papers also acknowledged more funding bodies. Most of the BBC stories were put in context by external commentators, of whom the large majority was from the UK's cancer research charities.

Linder, L. (2010). "Exploring the evidence in pediatric hematology and oncology nursing through the "article of the month"." Journal of Pediatric Oncology Nursing 27(1): 48-53.

As the scope of pediatric hematology and oncology nursing expands, nurses are challenged with staying current in the evidence guiding their practice. Nurse-reported barriers to accessing and utilizing research include lack of time as well as difficulty in accessing, understanding, and synthesizing findings. Journal clubs provide a process to guide nurses in the review of current literature related to their practice and promote utilization of research and evidence-based practice among nurses. This article describes the transition of an in-person journal club to an electronically delivered "Article of the Month." The "Article of the Month" is offered six times each year and is posted on the service line's password-protected intranet website. Oversight of the "Article of the Month" is provided by the service line clinical nurse specialist who selects articles based on an annual learning needs assessment and develops a quiz to assess learning and promote critical thinking among nursing staff. Outcomes include anecdotal reports of increased staff confidence in managing emergent patient care needs and greater appreciation of nursing care issues for children with cancer. Areas for future development include exploring options for increasing in-person discussion of issues addressed in the "Article of the Month" among staff members, extending the "Article of the Month" to nurses in other service areas who care for children with cancer, and increasing staff participation in article selection and quiz item development. An ultimate goal is to develop formal evaluation strategies to link this educational strategy to clinical outcomes.

Liu, D., M. Ajlouni, et al. (2009). "Analysis of outcomes in radiation oncology: an integrated computational platform." Medical Physics 36(5): 1680-1689.

Radiotherapy research and outcome analyses are essential for evaluating new methods of radiation delivery and for assessing the benefits of a given

technology on locoregional control and overall survival. In this article, a computational platform is presented to facilitate radiotherapy research and outcome studies in radiation oncology. This computational platform consists of (1) an infrastructural database that stores patient diagnosis, IMRT treatment details, and follow-up information, (2) an interface tool that is used to import and export IMRT plans in DICOM RT and AAPM/RTOG formats from a wide range of planning systems to facilitate reproducible research, (3) a graphical data analysis and programming tool that visualizes all aspects of an IMRT plan including dose, contour, and image data to aid the analysis of treatment plans, and (4) a software package that calculates radiobiological models to evaluate IMRT treatment plans. Given the limited number of general-purpose computational environments for radiotherapy research and outcome studies, this computational platform represents a powerful and convenient tool that is well suited for analyzing dose distributions biologically and correlating them with the delivered radiation dose distributions and other patient-related clinical factors. In addition the database is web-based and accessible by multiple users, facilitating its convenient application and use.

Liu, F., J. A. White, et al. (2011). "GCOD - GeneChip Oncology Database." BMC Bioinformatics 12: 46.

BACKGROUND: DNA microarrays have become a nearly ubiquitous tool for the study of human disease, and nowhere is this more true than in cancer. With hundreds of studies and thousands of expression profiles representing the majority of human cancers completed and in public databases, the challenge has been effectively accessing and using this wealth of data. DESCRIPTION: To address this issue we have collected published human cancer gene expression datasets generated on the Affymetrix GeneChip platform, and carefully annotated those studies with a focus on providing accurate sample annotation. To facilitate comparison between datasets, we implemented a consistent data normalization and transformation protocol and then applied stringent quality control procedures to flag low-quality assays. CONCLUSION: The resulting resource, the GeneChip Oncology Database, is available through a publicly accessible website that provides several query options and analytical tools through an intuitive interface.

Lockhart, J. S. and L. M. Goodfellow (2009). "The effect of a 5-week head & neck surgical oncology practicum on nursing students' perceptions of facial disfigurement: part I." ORL - Head & Neck Nursing 27(3): 7-12.

PURPOSE: This pilot study tested the effectiveness of a head and neck surgical oncology clinical practicum on nursing students' perceptions of facial disfigurement in these patients. Hypotheses also addressed the impact of patient and student gender; patterns in perceptions based on patient gender and surgical procedure were noted. DESIGN: A two-group pretest-posttest repeated measures experimental design was used with King's Theory of Goal Attainment (King, 1971, 1981) serving as the framework. SAMPLE/SETTING: Thirty-seven junior-level male (n=9) and female (n=28) nursing students enrolled in a baccalaureate program's adult medical-surgical course were randomly assigned

to a 5-week clinical experience in an urban university-affiliated medical center. The Experimental Group (n=19) was assigned to a head and neck surgical oncology unit and the Control Group (n=18) was assigned to a general surgical unit. PROCEDURES: All students completed the Demographic Data Form-Student Version (DDF-SV) and the Modified Disfigurement Scale (MDS) (Lockhart, 1992a, 1992b, 1999, 2000) prior to attending a 4-hour lecture Care of Head and Neck Surgical Patients, a 45-minute clinical conference Care of Facially Disfigured Patients, and the 5-week clinical practicum. All students repeated the MDS after their clinical practicum. RESULTS: A two-way repeated measures analysis of variance and analysis of covariance revealed no significant differences in ratings, irrespective of clinical group or student gender; all photos were described as being "moderately disfigured". All students rated female patients as being significantly more disfigured than male patients with identical surgical procedures. Both male and female photos were similarly rank-ordered according to severity of disfigurement; surgeries that involved the central portion of the face were rated as being more severely disfigured than surgeries that affected peripheral portions.

Loiselle, C. G., L. Edgar, et al. (2010). "The impact of a multimedia informational intervention on psychosocial adjustment among individuals with newly diagnosed breast or prostate cancer: a feasibility study." Patient Education & Counseling 80(1): 48-55.

OBJECTIVE: To examine the impact of an 8-week cancer multimedia informational intervention on health-related outcomes among individuals newly diagnosed with cancer. METHODS: Using a pre-/post-quasi-experimental design, participants with breast or prostate cancer (n=250) were conveniently recruited from four oncology ambulatory clinics and completed questionnaires at three points (enrolment, 1-2 weeks post-intervention, and 3 months later). RESULTS: Repeated-measure analyses showed that, when compared to controls, the intervention significantly improved satisfaction with cancer information over time for women (p<.001), prevented deterioration in functional quality of life (p=.030) and marginally improved perceived oncologist informational support (p=.051). There were no significant differences in psychosocial adjustment among men. Unlike previously suggested, the intervention did not have a differential impact according to levels of personal resources (self-esteem, mastery, and optimism). However, for all outcomes and regardless of group, participants high in personal resources reported better adjustment across time. CONCLUSION: Even though the hypotheses were only partially supported, the findings provide preliminary evidence that multimedia interventions can be supportive. PRACTICE IMPLICATIONS: With increasing numbers of new cancer diagnoses, cancer survivors and more limited health care resources, further research is needed to evaluate potential benefits of health information technology in providing support to individuals facing cancer. Copyright 2009 Elsevier Ireland Ltd. All rights reserved.

Losko, S. and K. Heumann (2009). "Semantic data integration and knowledge management to represent biological network associations." Methods in Molecular

Biology 563: 241-258.

The vast quantities of information generated by academic and industrial research groups are reflected in a rapidly growing body of scientific literature and exponentially expanding resources of formalized data including experimental data from "-omics" platforms, phenotype information, and clinical data. For bioinformatics, several challenges remain: to structure this information as biological networks enabling scientists to identify relevant information; to integrate this information as specific "knowledge bases"; and to formalize this knowledge across multiple scientific domains to facilitate hypothesis generation and validation and, thus, the generation of new knowledge. Risk management in drug discovery and clinical research is used as a typical example to illustrate this approach. In this chapter we will introduce techniques and concepts (such as ontologies, semantic objects, typed relationships, contexts, graphs, and information layers) that are used to represent complex biomedical networks. The BioXM Knowledge Management Environment is used as an example to demonstrate how a domain such as oncology is represented and how this representation is utilized for research.

Luo, W., B. L. Nordstrom, et al. (2008). "Adherence to guidelines for use of erythropoiesis-stimulating agents in patients with chemotherapy-induced anemia: results of a retrospective study of an electronic medical-records database in the United States, 2002-2006." Clinical Therapeutics 30(12): 2423-2435.

BACKGROUND: Chemotherapy-induced anemia (CIA) commonly occurs in cancer patients receiving conventional myelosuppressive chemotherapy. Two national guidelines regarding the use of erythropoiesis-stimulating agents (ESAs) in CIA were released in 2002. Because of poorer disease outcomes and increased risk of adverse events associated with ESAs in recent studies, the use of ESAs has been increasingly restricted in practice guidelines in the years 2007 and 2008. Objective: The aim of this study was to provide a baseline for adherence to national guidelines in the use of ESAs for CIA between 2002 and 2006. METHODS: This retrospective study used the Varian Medical Oncology database (Varian Medical Systems, Inc., Palo Alto, California) of electronic medical records, representing 17 outpatient oncology organizations at 71 clinic locations in the United States. Adults diagnosed with any malignant neoplasm who started conventional cytotoxic chemotherapy between January 1, 2002, and September 30, 2006, were included. The proportion of patients receiving an ESA was calculated by hemoglobin (Hb) level during each chemotherapy cycle, stratified by line of chemotherapy and year. Logistic regression modeling identified predictors of ESA use in anemic patients during the first chemotherapy cycle. RESULTS: The records of 17,731 cancer patients were evaluated. Median (SD) age was 61 (13) years, and 58.9% were female. Most patients (84.1%) had a solid tumor. Many patients (41.3%) received platinum containing chemotherapy and 74.4% received combination chemotherapy. During the first 5 cycles of first-line chemotherapy among patients with CIA (Hb <11 g/dL), ESAs were used by 55.8% of patients at cycle 1 and 68.9% at cycle 5. ESA use in CIA patients increased across lines of chemotherapy and time. Few patients (2.8%) received

an ESA at Hb >13 g/dL. The statistically significant predictors of ESA use included age >65 years, eastern US residence, private health insurance, community-based care, and solid tumors, especially lung cancer. CONCLUSION: The patterns we observed were generally consistent with prevailing ESA labels and national guidelines during 2002 through 2006. Although ESA use in patients with CIA increased over chemotherapy cycles, lines of chemotherapy, and time, <70% of CIA episodes were treated with ESAs during the initial 5 chemotherapy cycles.

Lv, D., X. Wang, et al. (2010). "Perioperative enhanced recovery programmes for gynaecological cancer patients." Cochrane Database of Systematic Reviews(6): CD008239.

BACKGROUND: Gynaecological malignancies contribute to 10 to 15% of cancers in women internationally. In recent years, a trend towards new perioperative care strategies has been documented as "Fast Track (FT) surgery", or "Enhanced Recovery Programmes" to replace some traditional approaches in surgical care. The FT multimodal programmes may enhance the postoperative recovery by means of reducing surgical stress. This systematic review aims to fully assess the beneficial and harmful effects of FT programmes in gynaecological cancer care. OBJECTIVES: To evaluate the beneficial and harmful effects of FT programmes in gynaecological cancer care. SEARCH STRATEGY: We searched the following databases, The Cochrane Gynaecological Cancer Collaborative Review Group's Trial Register, the Cochrane Central Register of Controlled Trials (CENTRAL) Issue 4, 2009, MEDLINE and EMBASE to November 2009. In addition, all reference lists of included trials were searched and experts in the gynaecological oncology community were contacted in an attempt to locate trials. SELECTION CRITERIA: All randomised controlled trials (RCTs) comparing any type of FT programmes for surgery in gynaecological cancer to conventional recovery strategies were included. DATA COLLECTION AND ANALYSIS: Two review authors independently screened studies for inclusion. Since no RCTs were identified, data collection and analysis could not be performed. MAIN RESULTS: No studies were found that met the inclusion criteria. AUTHORS' CONCLUSIONS: We currently have no evidence from high quality studies to support or refute the use of perioperative enhanced recovery programmes for gynaecological cancer patients. Further well-designed RCTs with standard FT programmes are needed. [References: 40]

Lyss, A. P. and R. C. Lilenbaum (2009). "Accrual to National Cancer Institute-sponsored non-small-cell lung cancer trials: insights and contributions from the CCOP program." Clinical Lung Cancer 10(6): 410-413.

BACKGROUND: The Community Clinical Oncology Program (CCOP) has been a success in augmenting accrual to cooperative group research trials from community-based institutions. We analyzed accruals to selected phase II and III cooperative group non-small-lung cancer (NSCLC) trials to determine specific accrual patterns that might guide the implementation of future studies and their

application to community settings. PATIENTS AND METHODS: Data from each of the adult multispecialty cooperative group trials that studied treatment interventions in NSCLC and completed accrual from 2000 to 2005 were gathered. We tabulated and analyzed information regarding the percentage of total accrual that derived from CCOPs according to cooperative group, extent of disease, trial phase, and modality of treatment. RESULTS: CCOP contributions did not seem to vary greatly by phase of study or by extent of disease. In general, CCOP accrual to Radiation Therapy Oncology Group trials was lower than for the other cooperative groups. CCOP accrual to multimodality trials, in which systemic treatment was not the primary study question, was poorer. Trials of standard therapy with or without a new therapeutic agent in advanced disease tend to enjoy better accrual. CONCLUSION: Multidisciplinary studies in NSCLC provide challenges for CCOPs and will require more effort and greater incentives. CCOP leaders should participate more actively in the design and implementation of cooperative group NSCLC trials in order to maximize their participation.

Macpherson, C. F. (2008). "Peer-supported storytelling for grieving pediatric oncology nurses." Journal of Pediatric Oncology Nursing 25(3): 148-163.

Telling stories about deceased patients to supportive peers is frequently mentioned as an activity used for meaning-making in anecdotal reports of clinical practice and the literature addressing nurses' experiences caring for dying children. This study examines peer-supported storytelling for grieving pediatric oncology nurses using a mixed methods single-group descriptive repeated measures design. Participants were 6 registered nurses from a tertiary care pediatric hospital inpatient oncology unit who self-identified as experiencing grief. Participants met in self-selected dyads for 2 storytelling sessions. Questionnaires were completed at baseline, midpoint, and study end. Sessions were audio-recorded. Participants reported (1) receiving and providing support during sessions; (2) that sessions had an impact on their grief; (3) that sessions had an impact on their meaning-making, and the explicit session focus on making sense of and identifying benefit in their experiences was particularly helpful. There was a significant positive correlation between participant report of number of special patient deaths during career and impact of sessions on grief.

Mandal, A., A. K. Asthana, et al. (2008). "Development of an electronic radiation oncology patient information management system." Journal of Cancer Research & Therapeutics 4(4): 178-185.

The quality of patient care is critically influenced by the availability of accurate information and its efficient management. Radiation oncology consists of many information components, for example there may be information related to the patient (e.g., profile, disease site, stage, etc.), to people (radiation oncologists, radiological physicists, technologists, etc.), and to equipment (diagnostic, planning, treatment, etc.). These different data must be integrated. A comprehensive information management system is essential for efficient storage and retrieval of the enormous amounts of information. A radiation therapy patient information system (RTPIS) has been developed using open source software.

PHP and JAVA script was used as the programming languages, MySQL as the database, and HTML and CSF as the design tool. This system utilizes typical web browsing technology using a WAMP5 server. Any user having a unique user ID and password can access this RTPIS. The user ID and password is issued separately to each individual according to the person's job responsibilities and accountability, so that users will be able to only access data that is related to their job responsibilities. With this system authentic users will be able to use a simple web browsing procedure to gain instant access. All types of users in the radiation oncology department should find it user-friendly. The maintenance of the system will not require large human resources or space. The file storage and retrieval process would be be satisfactory, unique, uniform, and easily accessible with adequate data protection. There will be very little possibility of unauthorized handling with this system. There will also be minimal risk of loss or accidental destruction of information.

Mandal, A., A. K. Asthana, et al. (2010). "Experience of wireless local area network in a radiation oncology department." Journal of Cancer Research & Therapeutics 6(2): 148-151.

The aim of this work is to develop a wireless local area network (LAN) between different types of users (Radiation Oncologists, Radiological Physicists, Radiation Technologists, etc) for efficient patient data management and to made easy the availability of information (chair side) to improve the quality of patient care in Radiation Oncology department. We have used mobile workstations (Laptops) and stationary workstations, all equipped with wireless-fidelity (Wi-Fi) access. Wireless standard 802.11g (as recommended by Institute of Electrical and Electronic Engineers (IEEE, Piscataway, NJ) has been used. The wireless networking was configured with the Service Set Identifier (SSID), Media Access Control (MAC) address filtering, and Wired Equivalent Privacy (WEP) network securities. We are successfully using this wireless network in sharing the indigenously developed patient information management software. The proper selection of the hardware and the software combined with a secure wireless LAN setup will lead to a more efficient and productive radiation oncology department.

Mandal, A., A. K. Asthana, et al. (2010). "Workload modeling for teletherapy unit." Journal of Cancer Research & Therapeutics 6(1): 27-30.

AIMS: This study aims to derive a radiotherapy workload model using a prospectively collected dataset of patient and treatment information from a teletherapy treatment unit. MATERIALS AND METHODS: Information about all individual radiotherapy treatment was collected for two weeks from the Phoenix unit in our department. This information included diagnosis, treatment site, treatment time, fields per fraction, technique, use of blocks and wedges. Data were collected for two weeks (10 working days) in January 2008. During this time, 45 patients were treated with 450 fractions of external beam radiotherapy in Phoenix unit. RESULTS: The mean fraction duration, irradiation time and setup time were 9.55 minutes, 1.84 minutes and 7.66 minutes respectively. A mathematical workload model was derived using the average fraction duration

time, total irradiation time and setup time of different types of treatment. A simple software program (Workload Calculation Chart) was also constructed in Microsoft Excel using the derived algorithm. The model based software program was tested and applied for one year and found that it can be used effectively to describe workload of teletherapy unit. CONCLUSION: Proposed methodology for workload modeling of teletherapy unit and the workload calculation software is very effective to quantitatively plan/calculate the optimal workload which will satisfy both the patient care administrator and radiation therapy technologists.

Markert, A., V. Thierry, et al. (2009). "Chemotherapy safety and severe adverse events in cancer patients: strategies to efficiently avoid chemotherapy errors in in- and outpatient treatment." International Journal of Cancer 124(3): 722-728.

To enhance the quality and safety in cancer treatment, and in acknowledgement that medical errors occur, we have established 2 error management systems: one monitors chemotherapy errors, the other records all severe adverse events occurring in chemotherapy-treated cancer patients (SAECTx) in in- and outpatient treatment. These error systems have been implemented by our departmental "Clinical Service Center," a multidisciplinary team which controls all chemotherapy protocols and orders prior to the medication reaching the patient. We performed a prospective cohort study in consecutive cancer patients who received chemotherapies in our department between January 2005 and December 2006. Over this 2-year period, 2,337 patients were treated, with an equal distribution as in- and outpatients: 22,216 consecutive chemotherapy orders were analyzed, of which 83.5% were completely flawless, whereas we detected and corrected medical and administrative errors in 17.1%: in 3.8%, these errors involved the chemotherapy itself, in 4.5% the patient data and in 8.7% missing written informed consent forms. Chemotherapy errors were less frequent in outpatients than inpatients (3.3 vs. 4.5%, respectively). In outpatients, the rate of chemotherapy errors decreased from 4% in 2005 to 2.8% in 2006, but remained stable for inpatients (4.4% 2005 vs. 4.7% 2006). Among a total of 3,792 detected errors, only 3 reached the patient, resulting in an error rate in patients of 0.079%. Therefore, since we detected a substantial number of chemotherapy-related errors and intercepted 99.9%, we recommend our efficient surveillance system as an important safety check, thereby ensuring that chemotherapies are delivered error-free to cancer patients. Copyright (c) 2008 Wiley-Liss, Inc.

Martin, M. Y., L. A. Pollack, et al. (2011). "Tailoring cancer education and support programs for low-income, primarily African American cancer survivors." Oncology Nursing Forum 38(1): E55-59.

PURPOSE/OBJECTIVES: to identify the information and stress-management topics of most interest to low-income, predominantly African American cancer survivors. RESEARCH APPROACH: descriptive, cross sectional. SETTING: outpatient oncology clinic in a public hospital in Birmingham, Alabama. PARTICIPANTS: 25 patients with cancer; 12 were men, 22 were African Americans, and 16 had a 12th-grade education or less. METHODOLOGIC

APPROACH: patients ranked potential topics to be included in an educational curriculum. MAIN RESEARCH VARIABLES: quantitative rankings of information and stress-management priorities. FINDINGS: learning about cancer, understanding cancer treatments, relieving cancer pain, and keeping well in mind and body were the most highly ranked topics among those offered within the American Cancer Society's I Can Cope curriculum, which also included supportive topics such as mobilizing social support. The preferred stress-management topics were humor therapy, music therapy, meditation, and relaxation; lower-ranked topics included pet therapy and art as therapy. CONCLUSIONS: cancer survivors appear most interested in topics specific to their illness and treatment versus supportive topics. Stress management also received high rankings. INTERPRETATION: nurses have a key role in providing patient education and support. Tailoring education programs may better target specific needs and improve the quality of cancer care of underserved patients.

Martin, S., J. Troccaz, et al. (2010). "Automated segmentation of the prostate in 3D MR images using a probabilistic atlas and a spatially constrained deformable model." Medical Physics 37(4): 1579-1590.

PURPOSE: The authors present a fully automatic algorithm for the segmentation of the prostate in three-dimensional magnetic resonance (MR) images. METHODS: The approach requires the use of an anatomical atlas which is built by computing transformation fields mapping a set of manually segmented images to a common reference. These transformation fields are then applied to the manually segmented structures of the training set in order to get a probabilistic map on the atlas. The segmentation is then realized through a two stage procedure. In the first stage, the processed image is registered to the probabilistic atlas. Subsequently, a probabilistic segmentation is obtained by mapping the probabilistic map of the atlas to the patient's anatomy. In the second stage, a deformable surface evolves toward the prostate boundaries by merging information coming from the probabilistic segmentation, an image feature model and a statistical shape model. During the evolution of the surface, the probabilistic segmentation allows the introduction of a spatial constraint that prevents the deformable surface from leaking in an unlikely configuration. RESULTS: The proposed method is evaluated on 36 exams that were manually segmented by a single expert. A median Dice similarity coefficient of 0.86 and an average surface error of 2.41 mm are achieved. CONCLUSIONS: By merging prior knowledge, the presented method achieves a robust and completely automatic segmentation of the prostate in MR images. Results show that the use of a spatial constraint is useful to increase the robustness of the deformable model comparatively to a deformable surface that is only driven by an image appearance model.

Martins, S. B., Y. Shahar, et al. (2008). "Evaluation of an architecture for intelligent query and exploration of time-oriented clinical data." Artificial Intelligence in Medicine 43(1): 17-34.

OBJECTIVE: Evaluate KNAVE-II, a knowledge-based framework for

visualization, interpretation, and exploration of longitudinal clinical data, clinical concepts and patterns. KNAVE-II mediates queries to a distributed temporal-abstraction architecture (IDAN), which uses a knowledge-based problem-solving method specializing in on-the-fly computation of clinical queries. METHODS: A two-phase, balanced cross-over study to compare efficiency and satisfaction of a group of clinicians when answering queries of variable complexity about time-oriented clinical data, typical for oncology protocols, using KNAVE-II, versus standard methods: both paper charts and a popular electronic spreadsheet (ESS) in Phase I; an ESS in Phase II. The measurements included the time required to answer and the correctness of answer for each query and each complexity category, and for all queries, assessed versus a predetermined gold standard set by a domain expert. User satisfaction was assessed by the Standard Usability Score (SUS) tool-specific questionnaire and by a "Usability of Tool Comparison" comparative questionnaire developed for this study. RESULTS: In both evaluations, subjects answered higher-complexity queries significantly faster using KNAVE-II than when using paper charts or an ESS up to a mean of 255 s difference per query versus the ESS for hard queries ($p=0.0003$) in the second evaluation. Average correctness scores when using KNAVE-II versus paper charts, in the first phase, and the ESS, in the second phase, were significantly higher over all queries. In the second evaluation, 91.6% (110/120) of all of the questions asked within queries of all levels produced correct answers using KNAVE-II, opposed to only 57.5% (69/120) using the ESS ($p<0.0001$). User satisfaction with KNAVE-II was significantly superior compared to using either a paper chart or the ESS ($p=0.006$). Clinicians ranked KNAVE-II superior to both paper and the ESS. CONCLUSIONS: An evaluation of the functionality and usability of KNAVE-II and its supporting knowledge-based temporal-mediation architecture has produced highly encouraging results regarding saving of physician time, enhancement of accuracy of clinical assessment, and user satisfaction.

Mascaro, A. A., C. A. Mello, et al. (2009). "Mammographic images segmentation using texture descriptors." Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2009: 3653-3656.

Tissue classification in mammography can help the diagnosis of breast cancer by separating healthy tissue from lesions. We present herein the use of three texture descriptors for breast tissue segmentation purposes: the Sum Histogram, the Gray Level Co-Occurrence Matrix (GLCM) and the Local Binary Pattern (LBP). A modification of the LBP is also proposed for a better distinction of the tissues. In order to segment the image into its tissues, these descriptors are compared using a fidelity index and two clustering algorithms: k-Means and SOM (Self-Organizing Maps).

Masera, G. (2008). "Income matters: reducing the mortality gap." Lancet Oncology 9(8): 703-704.

Maserat, E. (2008). "Information communication technology: new approach for rural

cancer care improvement." Asian Pacific Journal of Cancer Prevention: Apjcp 9(4): 811-814.

Cancer control aims to reduce the incidence, morbidity, and mortality of cancer and to improve the quality of life of cancer patients. For rural populations this presents particular problems. This article covers challenges of oncology care in rural areas and solutions via applying information communication technology with specialty telemedicine for overcoming problems in prevention, early diagnosis, treatment, and palliative care. In addition, telecommunications infrastructures and frameworks for implementation of telemedicine are described. [References: 21]

Mayer, D. K., S. Ratichek, et al. (2010). "Development of a health-related website for parents of children receiving hematopoietic stem cell transplant: HSCT-CHESS." Journal of Cancer Survivorship 4(1): 67-73.

INTRODUCTION: Parents of pediatric hematopoietic stem cell transplant (HSCT) play a pivotal role in the care of their child during and after transplant. In addition to the child's comforter, parents also serve as care coordinators and conduits of communication between various health care providers, family and community members. The stress on the parent and family is enormous during this process, which for many is compounded by geographic dislocation to accompany their child during the rigorous treatment and recovery process. For many parents, their own recovery spans months to years. METHODS: Parental activation, a process of becoming informed to participate in decisions, collaborate with health care providers, and manage care provided the conceptual framework to develop an eHealth approach for this population. HSCT-CHESS was developed, based on previous success with an existing eHealth system of integrated services, the Comprehensive Health Enhancement Support System (CHESS). CHESS(TM) is designed to help individuals and families cope with a health crisis or medical concern. The iterative user-centered development process for HSCT-CHESS included parents of HSCT recipients, representatives from an HSCT Advocacy Group, and members of the clinical, research, development and design teams. This rigorous process, including online focus groups and surveys, utilization of a parental user group, and an editorial and development process are described. CONCLUSION: As the population of cancer survivors and caregivers increase and as the oncology workforce becomes more stretched; developing eHealth applications may be an approach to address many of caregivers unmet needs. The purpose in describing this process is to help others when considering such an endeavor. HSCT-CHESS is now being tested in a randomized controlled trial versus standard care to evaluate its impact on the quality of life of both the parent and child HSCT recipient.

McBain, C. A., C. J. Moore, et al. (2008). "Early clinical evaluation of a novel three-dimensional structure delineation software tool (SCULPTER) for radiotherapy treatment planning." British Journal of Radiology 81(968): 643-652.

Modern radiotherapy treatment planning (RTP) necessitates increased delineation of target volumes and organs at risk. Conventional manual delineation is a laborious, time-consuming and subjective process. It is prone to

inconsistency and variability, but has the potential to be improved using automated segmentation algorithms. We carried out a pilot clinical evaluation of SCULPTER (Structure Creation Using Limited Point Topology Evidence in Radiotherapy) - a novel prototype software tool designed to improve structure delineation for RTP. Anonymized MR and CT image datasets from patients who underwent radiotherapy for bladder or prostate cancer were studied. An experienced radiation oncologist used manual and SCULPTER-assisted methods to create clinically acceptable organ delineations. SCULPTER was also tested by four other RTP professionals. Resulting contours were compared by qualitative inspection and quantitatively by using the volumes of the structures delineated and the time taken for completion. The SCULPTER tool was easy to apply to both MR and CT images and diverse anatomical sites. SCULPTER delineations closely reproduced manual contours with no significant volume differences detected, but SCULPTER delineations were significantly quicker ($p<0.05$) in most cases. In conclusion, clinical application of SCULPTER resulted in rapid and simple organ delineations with equivalent accuracy to manual methods, demonstrating proof-of-principle of the SCULPTER system and supporting its potential utility in RTP.

McConnell, P., R. C. Dash, et al. (2008). "The cancer translational research informatics platform." BMC Medical Informatics & Decision Making 8: 60.

BACKGROUND: Despite the pressing need for the creation of applications that facilitate the aggregation of clinical and molecular data, most current applications are proprietary and lack the necessary compliance with standards that would allow for cross-institutional data exchange. In line with its mission of accelerating research discoveries and improving patient outcomes by linking networks of researchers, physicians, and patients focused on cancer research, caBIG (cancer Biomedical Informatics Grid) has sponsored the creation of the caTRIP (Cancer Translational Research Informatics Platform) tool, with the purpose of aggregating clinical and molecular data in a repository that is user-friendly, easily accessible, as well as compliant with regulatory requirements of privacy and security. RESULTS: caTRIP has been developed as an N-tier architecture, with three primary tiers: domain services, the distributed query engine, and the graphical user interface, primarily making use of the caGrid infrastructure to ensure compatibility with other tools currently developed by caBIG. The application interface was designed so that users can construct queries using either the Simple Interface via drop-down menus or the Advanced Interface for more sophisticated searching strategies to using drag-and-drop. Furthermore, the application addresses the security concerns of authentication, authorization, and delegation, as well as an automated honest broker service for deidentifying data. CONCLUSION: Currently being deployed at Duke University and a few other centers, we expect that caTRIP will make a significant contribution to further the development of translational research through the facilitation of its data exchange and storage processes.

McDaniel, A. M., V. L. Champion, et al. (2008). "A transdisciplinary training program for

behavioral oncology and cancer control scientists." Nursing Outlook 56(3): 123-131.

Transdisciplinary health research training has been identified as a major initiative to achieve the vision for research teams of the future as articulated in the National Institutes of Health (NIH) Roadmap for Medical Research. To address the need for scientists who can integrate diverse scientific approaches and work in transdisciplinary teams to solve complex health problems, Indiana University (IU) has designed an innovative training program that will provide the didactic and research experiences to enable trainees to establish productive careers in behavioral oncology and cancer control research. Development of a successful transdisciplinary training program requires mentorship, research, and a specialized curriculum that encompass a broad range of disciplines. The program capitalizes on a unique set of existing and emerging training opportunities resulting from the collaborative activities of the IU Simon Cancer Center, the IU Schools of Nursing and Medicine, and multiple research institutes and academic centers located in Indiana and neighboring states.

McNees, P. (2009). "Technology application to assist young survivors with fertility concerns." Seminars in Oncology Nursing 25(4): 284-287.

OBJECTIVES: To provide an overview of the relationship of communication technology with cancer and fertility concerns; a brief description of one example of a project for young breast cancer survivors; a profile of women who participated in the project; and a consideration of the future role of oncology nurses in developing and utilizing technology to address cancer and fertility concerns. DATA SOURCES: Literature, experiential original data. CONCLUSION: Communication technology provides an ever increasing array of tools, but it is the oncology nurse who is in a pivotal position to maximize the benefits that patients realize through the use of such supportive technologies. IMPLICATIONS FOR NURSING PRACTICE: Oncology nurses are in a pivotal position to assure that communication technologies are appropriately used to provide access to evidence-based information about cancer and fertility.

McNiff, K. K., M. N. Neuss, et al. (2008). "Measuring supportive care in medical oncology practice: lessons learned from the quality oncology practice initiative." Journal of Clinical Oncology 26(23): 3832-3837.

We provide a brief review of the use of quality measures to assess supportive care in the medical oncology office. Specifically, we discuss the development and implementation of supportive care measures in the Quality Oncology Practice Initiative (QOPI), a voluntary quality measurement and improvement program of the American Society of Clinical Oncology. QOPI has demonstrated that medical oncologists voluntarily engage in self-assessment and often select measures related to supportive care for measurement and improvement. Results to date have demonstrated that there is room for improvement in this domain. Because supportive care measures appropriate for use through structured chart review in the outpatient oncology setting are not generally available in the published literature, measures have been developed and tested through the program. Additional measures are in development for implementation in QOPI in 2008.

[References: 14]

Men, C., X. Gu, et al. (2009). "GPU-based ultrafast IMRT plan optimization." Physics in Medicine & Biology 54(21): 6565-6573.

The widespread adoption of on-board volumetric imaging in cancer radiotherapy has stimulated research efforts to develop online adaptive radiotherapy techniques to handle the inter-fraction variation of the patient's geometry. Such efforts face major technical challenges to perform treatment planning in real time. To overcome this challenge, we are developing a supercomputing online re-planning environment (SCORE) at the University of California, San Diego (UCSD). As part of the SCORE project, this paper presents our work on the implementation of an intensity-modulated radiation therapy (IMRT) optimization algorithm on graphics processing units (GPUs). We adopt a penalty-based quadratic optimization model, which is solved by using a gradient projection method with Armijo's line search rule. Our optimization algorithm has been implemented in CUDA for parallel GPU computing as well as in C for serial CPU computing for comparison purpose. A prostate IMRT case with various beamlet and voxel sizes was used to evaluate our implementation. On an NVIDIA Tesla C1060 GPU card, we have achieved speedup factors of 20-40 without losing accuracy, compared to the results from an Intel Xeon 2.27 GHz CPU. For a specific nine-field prostate IMRT case with 5 x 5 mm(2) beamlet size and 2.5 x 2.5 x 2.5 mm(3) voxel size, our GPU implementation takes only 2.8 s to generate an optimal IMRT plan. Our work has therefore solved a major problem in developing online re-planning technologies for adaptive radiotherapy.

Meneses, K., P. McNees, et al. (2010). "Development of the Fertility and Cancer Project: an Internet approach to help young cancer survivors." Oncology Nursing Forum 37(2): 191-197.

PURPOSE/OBJECTIVES: To describe the development of the Fertility and Cancer Project (FCP), an Internet approach to supplement information about fertility; describe FCP study participants' characteristics, fertility, cancer knowledge, and Internet use; and assess perceived information and support from the oncology team. DESIGN: Descriptive. SETTING: Internet, international. SAMPLE: 106 young survivors of breast cancer from eight countries. METHODS: FCP content was developed from the literature and interviews with breast cancer survivors, oncology professionals, and young women without cancer who were having fertility problems. Participants learned about the FCP through advocacy groups, cancer care providers, and Web searches. After enrollment, they completed five surveys: sociodemographic, breast cancer and health status, knowledge of fertility, Internet use, and the Medical Outcomes Study-Social Support Survey. MAIN RESEARCH VARIABLES: Sociodemographics, breast cancer, health status, fertility knowledge, Internet use, and social support. FINDINGS: Prior to diagnosis, most survivors had no fertility concerns, but more than 14% reported fertility problems. Following breast cancer diagnosis and treatment, 23 reported fertility problems. About half reported receiving little information about fertility options from the oncology team and were referred to a

reproductive endocrinologist. Internet use to obtain support and health information was common. Most reported frequent computer use and Internet access in their homes. Participants were most knowledgeable of the general and treatment-related factors that could affect fertility; they were least knowledgeable of infertility treatment. CONCLUSIONS: Results provide preliminary evidence about the demographic, cancer treatment, and support characteristics of young survivors of breast cancer who seek online information about fertility. IMPLICATIONS FOR NURSING: The Internet is a promising format for engaging young cancer survivors who seek information about fertility and cancer. Future studies can evaluate FCP effectiveness in delivering education and support interventions.

Miller, L. and C. M. Limbaugh (2008). "Applying evidence to develop a medical oncology fall-prevention program." Clinical Journal of Oncology Nursing 12(1): 158-160.

Miller, R. (2008). "Implementing a survivorship care plan for patients with breast cancer." Clinical Journal of Oncology Nursing 12(3): 479-487.

The growing number of cancer survivors challenges healthcare organizations to develop programs that support survivors' transition from active treatments to survivorship care. Many individuals and families continue to face complicated care issues resulting from cancer diagnosis and side effects long after completion of their treatments. This article describes a model of a survivorship care plan, Cancer Treatment Summary and Follow-Up Care Plan, piloted in an outpatient clinical setting in a community hospital for patients with breast cancer. The plan can be expanded to include other cancer types. The intent of the survivorship care plan is to strengthen the care connections and coordination of services for survivors of breast cancer to ensure that continuing care needs are met during the survivorship phase of the cancer trajectory. The survivorship care plan is a unique opportunity for oncology nurses to be catalysts for the interdisciplinary interactions that are required to develop survivorship care plans and to implement a change in oncology nursing practice. The intervention shifts the paradigm of cancer survivorship care from an acute care medical model to a wellness model for cancer survivors in the clinical setting.

Morgenlander, K. H., L. L. Schenken, et al. (2009). "Creation of community-based research capabilities in the neighborhood cancer care cooperative: administrative infrastructure, program initiatives, and evaluation priorities." Social Work in Public Health 24(4): 305-329.

The Radiation Oncology Community Outreach Group (ROCOG) and the Neighborhood Cancer Care Cooperative (NCCC) were developed to address oncology-related health disparities utilizing a community-based, collaborative organizational design. Funded in 2003 by the National Cancer Institute's Cancer Disparities Research Partnership program, ROCOG/NCCC has focused on reducing barriers to care and enhancing the health care system's responsiveness to minority and indigent populations within Southwestern Pennsylvania. This article will describe the component programs that have been developed under

this umbrella, as well as the evolved administrative, governance, and evaluation infrastructure that supports these initiatives.

Morita, T., K. Fujimoto, et al. (2008). "Screening for discomfort as the fifth vital sign using an electronic medical recording system: a feasibility study." Journal of Pain & Symptom Management 35(4): 430-436.

Late referral to a specialized palliative care service hinders quality symptomatic management. The aim of this article is to describe the feasibility and clinical usefulness of screening for patient discomfort as the fifth vital sign using an electronic medical recording system to identify patients with undertreated physical symptoms. For the electronic medical recording system, all admitted patients received routine nurse assessment of discomfort (defined as any physical symptom) at every vital signs check using Item 2 of the Support Team Assessment Schedule Japanese version (STAS). All medically treated cancer patients admitted to seven oncology units were automatically screened at one-week intervals. Positive screening was defined as a STAS score of 2 or more at least two times during the previous week. For each patient identified by screening, a palliative care team reviewed the medical record and provided written recommendations when other treatments might improve the patient's physical symptoms. Of 629 patients screened, 87 (14%) initially met the positive screening criteria. Fifteen (17%) were false positive due to psychiatric symptoms without physical symptoms or due to misrecording. Of 72 cases with actual discomfort, 33 had already been referred to the palliative care team, 14 had received adequate palliative care as determined by the palliative care team, 14 had self-limiting transient discomfort, and one patient died before the screening day. In the remaining 10 cases (11% of symptomatic patients, 1.7% of all screened patients), the palliative care team recommended potentially useful interventions for symptom control; seven patients were referred to the palliative care team within one week. The time required for all screening processes was about 30 minutes per week. This experience demonstrates that screening for patient discomfort as the fifth vital sign using an electronic medical recording system can be successfully implemented and may be useful in facilitating early referral of distressing patients to the specialized palliative care service.

Moss, L. (2010). "Thyroid Cancer Forum-UK (TCF-UK): a free, independent, multidisciplinary education resource and peer support organisation for consultants." Clinical Oncology (Royal College of Radiologists) 22(6): 508-511.

Mousavi, S. M., A. A. Alamolhoda, et al. (2008). "Implementation of Comprehensive National Cancer Control Program in Iran: an experience in a developing country." Annals of Oncology 19(2): 398-400.

Mousses, S., J. Kiefer, et al. (2008). "Using biointelligence to search the cancer genome: an epistemological perspective on knowledge recovery strategies to enable precision medical genomics." Oncogene 27 Suppl 2: S58-66.

Genomic profiling is beginning to extend beyond the many applications in

discovery research toward direct medical applications that hold the promise of more precise and individualized health-care delivery. There are many barriers and challenges that still need to be overcome before 'Precision Medical Genomics' can deliver the promise of more informed patient care, not the least of which is the unmet need for a new conceptual framework for recovering, understanding and translating potentially useful information from a single genome. Although a wide spectrum of scientific strategies, bioinformatic approaches, IT tools and knowledge resources have been developed to support discovery research, the interpretive requirements for recovering clinically useful insights from an individual's genome are different in many ways from those of traditional research goals. In this study, we compare and contrast the fundamental conceptual differences that distinguish 'research' to discover generalized knowledge from 'search' to recover individualized knowledge. We also consider the merits of applying evidence-based medicine and traditional scientific methods when n=1, and consider an alternative perspective based on a translational engineering approach and intelligence for interpreting genomic information from an individual case. Although the general idea of biological intelligence-based knowledge recovery that we introduce here can be broadly applied for personal genomics across many indications in medicine, we make a case that the need for adopting such a paradigm is greatest for supporting the management of complex diseases, and particularly suited for supporting therapeutic decisions in medical oncology. Early concepts for designing and implementing this kind of 'BioIntelligence' solution will be discussed. We also review the anticipated challenges of implementing genomic analysis and biological intelligence-based solutions in the practice of medical oncology by discussing some of the related pragmatic considerations for deploying the first generation of a 'Precision Medical Genomics' solution that can evolve and improve over time. [References: 20]

Murphy, K. C. (2009). "Assessing software impact on clinical workflow and resource utilization." Studies in Health Technology & Informatics 143: 309-314.

A usability study is described that compares a web-based capecitabine-prescribing and dispensing application to traditional manual methods. The behaviours of two small groups, oncologists and pharmacists, were recorded and analyzed using a case study of patient with metastatic colon cancer. The study indicated for the oncologists that workflow and resource utilization decreased due to the application, however, for the pharmacists the results were less positive. This type of case study simulation can be used to determine the impact of software applications on their users.

Mutic, S., R. S. Brame, et al. (2010). "Event (error and near-miss) reporting and learning system for process improvement in radiation oncology." Medical Physics 37(9): 5027-5036.

PURPOSE: The value of near-miss and error reporting processes in many industries is well appreciated and typically can be supported with data that have been collected over time. While it is generally accepted that such processes are

important in the radiation therapy (RT) setting, studies analyzing the effects of organized reporting and process improvement systems on operation and patient safety in individual clinics remain scarce. The purpose of this work is to report on the design and long-term use of an electronic reporting system in a RT department and compare it to the paper-based reporting system it replaced. METHODS: A specifically designed web-based system was designed for reporting of individual events in RT and clinically implemented in 2007. An event was defined as any occurrence that could have, or had, resulted in a deviation in the delivery of patient care. The aim of the system was to support process improvement in patient care and safety. The reporting tool was designed so individual events could be quickly and easily reported without disrupting clinical work. This was very important because the system use was voluntary. The spectrum of reported deviations extended from minor workflow issues (e.g., scheduling) to errors in treatment delivery. Reports were categorized based on functional area, type, and severity of an event. The events were processed and analyzed by a formal process improvement group that used the data and the statistics collected through the web-based tool for guidance in reengineering clinical processes. The reporting trends for the first 24 months with the electronic system were compared to the events that were reported in the same clinic with a paper-based system over a seven-year period. RESULTS: The reporting system and the process improvement structure resulted in increased event reporting, improved event communication, and improved identification of clinical areas which needed process and safety improvements. The reported data were also useful for the evaluation of corrective measures and recognition of ineffective measures and efforts. The electronic system was relatively well accepted by personnel and resulted in minimal disruption of clinical work. Event reporting in the quarters with the fewest number of reported events, though voluntary, was almost four times greater than the most events reported in any one quarter with the paper-based system and remained consistent from the inception of the process through the date of this report. However, the acceptance was not universal, validating the need for improved education regarding reporting processes and systematic approaches to reporting culture development. CONCLUSIONS: Specially designed electronic event reporting systems in a radiotherapy setting can provide valuable data for process and patient safety improvement and are more effective reporting mechanisms than paper-based systems. Additional work is needed to develop methods that can more effectively utilize reported data for process improvement, including the development of standardized event taxonomy and a classification system for RT.

Narimatsu, H., T. Matsumura, et al. (2008). "Detailed analysis of visitors to cancer-related web sites." Journal of Clinical Oncology 26(25): 4219-4223.

Negley, K. D., S. Ness, et al. (2009). "Building a collaborative nursing practice to promote patient education: an inpatient and outpatient partnership." Oncology Nursing Forum 36(1): 19-23.

Nelson, C., P. Balter, et al. (2008). "A technique for reducing patient setup uncertainties by aligning and verifying daily positioning of a moving tumor using implanted fiducials." Journal of Applied Clinical Medical Physics 9(4): 2766.

This study aimed to validate and implement a methodology in which fiducials implanted in the periphery of lung tumors can be used to reduce uncertainties in tumor location. Alignment software that matches marker positions on two-dimensional (2D) kilovoltage portal images to positions on three-dimensional (3D) computed tomography data sets was validated using static and moving phantoms. This software also was used to reduce uncertainties in tumor location in a patient with fiducials implanted in the periphery of a lung tumor. Alignment of fiducial locations in orthogonal projection images with corresponding fiducial locations in 3D data sets can position both static and moving phantoms with an accuracy of 1 mm. In a patient, alignment based on fiducial locations reduced systematic errors in the left-right direction by 3 mm and random errors by 2 mm, and random errors in the superior-inferior direction by 3 mm as measured by anterior-posterior cine images. Software that matches fiducial markers on 2D and 3D images is effective for aligning both static and moving fiducials before treatment and can be implemented to reduce patient setup uncertainties.

Neuss, M. N., J. O. Jacobson, et al. (2009). "Evolution and elements of the quality oncology practice initiative measure set." Cancer Control 16(4): 312-317.

BACKGROUND: Over the past 5 years, the American Society of Clinical Oncology (ASCO) has supported the development of a Web-based quality-reporting tool in response to a recognized need to provide medical oncologists the opportunity to demonstrate the quality of care that they are providing to patients. METHODS: The development of quality measures, their basis in the literature, and the descriptions and organizational structure of the measures are discussed. RESULTS: Specific results are the property of practices and are not shared outside of the practices except in aggregate. The system allows collection of information concerning a wide range of quality measures in a short period of time. In the last data collection period in the fall of 2008, information was submitted concerning 81 measures of quality divided into one required and six optional modules from over 250 practices concerning 15,000 patients. CONCLUSIONS: The timely collection of information on a wide range of quality measures regarding cancer patients can be efficiently collected using a Web-based data collection tool allowing for practice self-examination and comparison with other practices.

Ng, E. Y., S. V. Sree, et al. (2008). "The use of tissue electrical characteristics for breast cancer detection: a perspective review." Technology in Cancer Research & Treatment 7(4): 295-308.

Breast cancer is the most frequently occurring malignancy in women. It is characterized by a high mortality rate. For the purpose of detecting this life threatening disease, research efforts are being made worldwide to exploit new technologies, to improve the detection accuracy of current devices and to develop new detection devices, comprehensive diagnostic procedures, and

protocols. One such technology that is gaining popular attention over the recent years is the usage of electrical characteristics of the breast tissue to differentiate normal and cancerous tissues. Most of the devices using this technology are currently being used as adjunct diagnostic tools to improve the detection accuracy of established techniques like mammography and ultrasound. Also, early detection of breast cancer can help save many thousands of lives every year and can also reduce unnecessary healthcare expenditure caused by advanced stage treatment options. Hence, more research is also being done to adapt these devices into screening tools for early detection of breast cancer. The main objective of this review is to highlight the features of the currently available commercial devices that use this technology for breast cancer detection. The electrical behavior of normal and cancerous breast tissues is first presented. The various commercial devices that utilize electrical impedance or electropotentials for breast cancer detection are then described. Finally, conclusions and potential areas of research are highlighted. [References: 74]

Nieder, C., E. Haukland, et al. (2010). "Validation of new prognostic and predictive scores by sequential testing approach." Strahlentherapie und Onkologie 186(3): 169-173.

BACKGROUND AND PURPOSE: For practitioners, the question arises how their own patient population differs from that used in large-scale analyses resulting in new scores and nomograms and whether such tools actually are valid at a local level and thus can be implemented. A recent article proposed an easy-to-use method for the in-clinic validation of new prediction tools with a limited number of patients, a so-called sequential testing approach. The present study evaluates this approach in scores related to radiation oncology. MATERIAL AND METHODS: Three different scores were used, each predicting short overall survival after palliative radiotherapy (bone metastases, brain metastases, metastatic spinal cord compression). For each scenario, a limited number of consecutive patients entered the sequential testing approach (Table 1). The positive predictive value (PPV) was used for validation of the respective score and it was required that the PPV exceeded 80%. RESULTS: For two scores, validity in the own local patient population could be confirmed after entering 13 and 17 patients, respectively (Figures 1 and 3). For the third score, no decision could be reached even after increasing the sample size to 30 (Figure 2). CONCLUSION: In-clinic validation of new predictive tools with sequential testing approach should be preferred over uncritical adoption of tools which provide no significant benefit to local patient populations. Often the necessary number of patients can be reached within reasonable time frames even in small oncology practices. In addition, validation is performed continuously as the data are collected.

Nirenberg, A., N. K. Reame, et al. (2010). "Oncology nurses' use of National Comprehensive Cancer Network clinical practice guidelines for chemotherapy-induced and febrile neutropenia." Oncology Nursing Forum 37(6): 765-773.

PURPOSE/OBJECTIVES: To describe oncology nurses' use of National

Comprehensive Cancer Network (NCCN) clinical practice guidelines for chemotherapy-induced neutropenia (CIN) and febrile neutropenia (FN). DESIGN: Cross-sectional survey design; descriptive, correlational analysis. SETTING: E-mail invitation to Web-based survey. SAMPLE: Random sample of 309 Oncology Nursing Society (ONS) members with e-mail addresses who provide care to adult patients receiving chemotherapy. METHODS: The investigator-developed Neutropenia Oncology Nurses Survey was used. Descriptive tests compared respondents' personal and professional characteristics to those of general ONS members; nonparametric chi-square and Kruskal-Wallis tests were used to correlate respondents' survey subscale scores with demographic data. Significant associations were entered into multiple logistic regression models. MAIN RESEARCH VARIABLES: The Neutropenia Oncology Nurses Survey's subscales measured subjective norm, attitude, perceived competence and confidence, perceived barriers, and use of NCCN clinical practice guidelines for CIN and FN. FINDINGS: Response rate of nurses who opened the survey was 50%. Most practiced in community versus academic centers. Eighty percent reported using the NCCN clinical practice guidelines for CIN and FN. Respondents were more likely to use clinical practice guidelines when they were expected to by physician and nurse colleagues, they perceived fewer barriers, or they held advanced oncology certification. CONCLUSIONS: This study was the first to assess oncology nurses' reported use of NCCN clinical practice guidelines for CIN and FN. It also demonstrated the feasibility of partnering with ONS for Web-based survey research. IMPLICATIONS FOR NURSING: The findings give insight into work-place barriers to evidence-based practice in various settings. Expanding dissemination and implementation of clinical practice guideline recommendations will support the development of oncology nursing standards for risk assessment, management, and patient and family education in CIN and FN.

Norton, K. A., M. Wininger, et al. (2009). "A 2D mechanistic model of breast ductal carcinoma in situ (DCIS) morphology and progression." Journal of Theoretical Biology 263(4): 393-406.

Ductal carcinoma in situ (DCIS) of the breast is a non-invasive tumor in which cells proliferate abnormally, but remain confined within a duct. Although four distinguishable DCIS morphologies are recognized, the mechanisms that generate these different morphological classes remain unclear, and consequently the prognostic strength of DCIS classification is not strong. To improve the understanding of the relation between morphology and time course, we have developed a 2D in silico particle model of the growth of DCIS within a single breast duct. This model considers mechanical effects such as cellular adhesion and intra-ductal pressure, and biological features including proliferation, apoptosis, necrosis, and cell polarity. Using this model, we find that different regions of parameter space generate distinct morphological subtypes of DCIS, so elucidating the relation between morphology and time course. Furthermore, we find that tumors with similar architectures may in fact be produced through different mechanisms, and we propose future work to further disentangle the mechanisms involved in DCIS progression. (c) 2009 Elsevier Ltd. All rights

reserved.

Numico, G., M. Anfossi, et al. (2009). "The process of truth disclosure: an assessment of the results of information during the diagnostic phase in patients with cancer." Annals of Oncology 20(5): 941-945.

BACKGROUND: Surveys carried out in Mediterranean countries demonstrated very low rates of awareness of both diagnosis and prognosis among cancer patients. In our institution, a long-term training program aimed at improving communication skills among all physicians interacting with cancer patients was conducted. We report here the results of an extensive assessment of patients' awareness conducted after the first training period. PATIENTS AND METHODS: In a 2-year period, after every first visit of patients with a histological diagnosis of cancer, oncologists elicited perception of the patients and completed a structured questionnaire focusing on the understanding of the diagnosis and prognosis. Our data are thus a photograph of the results of the informative process conducted during the diagnostic phase. RESULTS: Among the enrolled 649 patients, 79.3% were aware of their diagnosis; factors significantly associated with higher levels of awareness were age younger than 70 and referral from surgery (versus internal medicine). Knowledge about the palliative or curative aims of future treatments (a surrogate sign of prognostic consciousness) was evident in 55.2%. CONCLUSIONS: Compared with historical data, our results show a high level of comprehension of the diagnosis of malignancy, probably due to the extensive training effort together with the method chosen for assessment.

O'Conner-Von, S. (2009). "Coping with cancer: a Web-based educational program for early and middle adolescents." Journal of Pediatric Oncology Nursing 26(4): 230-241.

Educating patients is a primary responsibility of all nurses; however, because of time constraints and staff shortages, pediatric oncology nurses are often unable to adequately prepare patients for cancer treatment. Instead, patients frequently rely on the Internet as a source of information about cancer, some of which can be outdated and inaccurate. Adolescents regard the Internet as a valuable source of health information as it is easily accessible, less threatening, and confidential. Considering the need for accurate, readily available information for adolescents with cancer, the purpose of this study was to develop and validate an innovative, interactive Web-based educational program to prepare early and middle adolescents for cancer treatment. Titled "Coping With Cancer," this program was developed by the investigator after conducting in-depth interviews of adolescent cancer survivors and their parents. Based on the transactional model of coping, the program focuses on enhancing the adolescent's knowledge of cancer, cancer treatment, and healthy coping strategies. Coping With Cancer can be an effective resource for pediatric oncology nurses in providing ongoing education for adolescents with cancer.

Ogle, S. K., W. L. Hobbie, et al. (2008). "Sperm banking for adolescents with cancer." Journal of Pediatric Oncology Nursing 25(2): 97-101.

Recent advances in diagnostic and therapeutic methods in pediatric oncology

have led to greater survival rates in children with malignancies. However, major long-term complications can occur that limit the quality of survival, infertility being one of them. Chemotherapy, radiation treatment, surgery, and combinations of these treatments have been implicated in causing infertility, with males being especially sensitive to therapy. Cryopreservation of semen, or sperm banking, is an easy, widely available means to preserve fertility for adolescent and young adult males with cancer. In this article, the pertinent literature is reviewed, and a sperm-banking program is described. Recommendations are offered for institutions attempting to develop a successful program, and the nurse's role in education and facilitation is discussed.

O'Neill, S. C. (2008). "A hereditary cancer syndrome seminar: perspective of a Continuing Medical Education (CME) Director." Familial Cancer 7(1): 3-4.

Orozco, A., V. Marin, et al. (2009). "International collaboration for pediatric oncology nursing leadership: Nicaragua and Canada." Canadian Oncology Nursing Journal 19(3): 105-109.

In 2005, with financial support from the Pediatric Oncology Group of Ontario, a pilot nursing leadership project linked pediatric oncology nurses from Canada with nurses at the La Mascota Hospital in Managua, Nicaragua. Following consultation with the pediatric oncology team in Nicaragua, a program was developed to strengthen clinical nursing leadership in a clinical setting through continuing education. The nurses believed that care of the patient and family improved due to the increased leadership skills of nurses in the unit and as the profile and credibility of nurses as peers in the health care team became evident. Providing nurses with the autonomy and financing for a project related directly to nursing care represented an important development for leadership in the profession.

Otte, J. B. and R. Meyers (2010). "PLUTO first report." Pediatric Transplantation 14(7): 830-835.

The PLUTO is a registry developed by an international collaboration of the Liver Tumors Strategy Group (SIOPEL) of the SIOP. Although the number of patients collected in PLUTO to date is too small to add any analytic power to the existing literature, this new registry has great promise. It has been created to clarify issues regarding the role of liver transplantation in the treatment of children with unresectable liver tumors. By reviewing the results to date, we hope we can motivate more centers to participate, enroll patients, complete data entry, and boost the potential impact of the collaborative effort. To achieve this goal, a large number of patients are needed, which requires an intensified international collaboration. Pediatric oncologists, pediatric surgical oncologists, and pediatric liver transplant surgeons are all encouraged to participate and contribute. This is a preliminary glimpse of what we hope to be a series of interim reports over the next decade from the steering committee to help guide therapy in this very challenging group of children. Copyright 2010 John Wiley & Sons A/S.

Ousley, A. L., J. A. Swarz, et al. (2010). "Cancer education and effective dissemination: information access is not enough." Journal of Cancer Education 25(2): 196-205.

Education is the main avenue for disseminating new research findings into clinical practice. Understanding factors that affect translation of research into practice may help cancer educators design programs that facilitate the time it takes for research-indicated practices to become standard care. To understand various factors, the National Cancer Institute (NCI) Office of Education and Special Initiatives (OESI)(1) with individual cooperation from Oncology Nursing Society (ONS), American Society of Clinical Oncology (ASCO), and Association of Oncology Social Work (AOSW) administered a Practitioner Information Needs survey to five different types of practitioners involved in cancer care. While most of the 2,864 practitioners (83%) agreed they had access to current practice information, practitioners in large practice settings were more likely to report having access to research than those small practice settings. However, only 33% indicated that they had adequate time to access the information. Colleagues or experts within the organization were cited as the most frequently relied on information resource (60%), and peer-reviewed journals were cited as second (57%). Overall, 66% strongly or somewhat agreed that their organizations exhibit effective change management practices. A majority (69%) agreed that implementation of new practices is hindered by the lack of available staff time. Financial factors and the characteristics of the information presented were also believed to be factors contributing to research implementation. Group differences were observed among practitioner groups and practice settings for some factors.

Ouwens, M. M., R. R. Hermens, et al. (2009). "Impact of an integrated care program for patients with head and neck cancer on the quality of care." Head & Neck 31(7): 902-910.

BACKGROUND: The management of patients with head and neck cancer is complex, and implementation of an integrated care program might improve the quality of care. METHODS: A prospective before-after study was performed in 1 clinic for head and neck oncology on 311 adults with head and neck cancer to evaluate an integrated care program. RESULTS: Scores on the integrated care indicators showed that the implementation of the integrated care program led to relevant improvements, eg, waiting time for diagnostic procedures less than 10 days (improvement of 37%), support for stopping smoking (+37%), nutrition support (+44%), assessment of CT and MRI scans by a an expert radiologist (+23%), and number of patients in contact with the specialist nurses (+37%). The program had no relevant effects on the outcome indicators. CONCLUSION: An integrated care program can improve several aspects of the management of patients with head and neck cancer.

Overend, A., K. Khoo, et al. (2008). "Evaluation of a nurse-led telephone follow-up clinic for patients with indolent and chronic hematological malignancies: a pilot study." Canadian Oncology Nursing Journal 18(2): 64-73.

A physician/nurse collaborative team sought to determine whether a nurse-led telephone clinic (Teleclinic) could effectively and safely be used to follow patients

with indolent and chronic hematological malignancies. Patients seen at their routine follow-up visit were assessed for eligibility for the Teleclinic, then referred to the pilot Teleclinic by their oncologist. Patients were interviewed by telephone by an oncology nurse experienced in hematologic malignancies. Fifty-three patients consented to participate in the pilot study. Following their Teleclinic interview, patients were asked to complete a "Subject Satisfaction Questionnaire" (SSQ). Overall patient satisfaction with the Teleclinic was high. It was determined that patients with low-grade and chronic hematological malignancies could be followed effectively and safely by an oncology nurse-led telephone clinic.

Owen-Smith, A., J. Hathaway, et al. (2008). "Screening for domestic violence in an oncology clinic: barriers and potential solutions." Oncology Nursing Forum 35(4): 625-633.

PURPOSE/OBJECTIVES: To evaluate the implementation of a domestic violence screening protocol in an oncology clinic. DESIGN: A retrospective review of a random sample of clinic medical records and qualitative surveys of nursing staff. SETTING: A gynecologic oncology clinic in a large teaching hospital. SAMPLE: 204 charts were abstracted and six oncology nurses completed surveys. METHODS: A random sample of patients from clinic appointment schedules was selected 6 and 12 months after the implementation of a domestic violence screening protocol. A brief written survey of nursing staff also was conducted. MAIN RESEARCH VARIABLES: Documentation of domestic violence screening, barriers to screening and documentation, and potential solutions to the barriers. FINDINGS: Sixty-three percent of the charts reviewed had a domestic violence screening record present, but only 12% of the charts with a screening record had documentation. Patients with domestic violence screening documentation were more likely to have had five or more clinic visits during the study period. The most frequent barriers to protocol implementation cited by nursing staff were forgetting to screen or document domestic violence screening. Nursing staff recommended adding domestic violence screening questions to forms and providing reminders to screen. CONCLUSIONS: Several barriers to successful implementation of a domestic violence screening protocol in a gynecologic oncology clinic, including documentation issues, were encountered. IMPLICATIONS FOR NURSING: Nurses interested in implementing a domestic violence screening protocol in their oncology clinic should consider reviewing the barriers to domestic violence screening and documentation and the potential solutions identified in this study.

Parchen, D. A., K. Castro, et al. (2008). "Developing outcomes for an oncology nurse internship program." Oncology Nursing Forum 35(5): 753-756.

Pare, G., C. Sicotte, et al. (2009). "A pre-post evaluation of a telehomecare program in oncology and palliative care." Telemedicine Journal & E-Health 15(2): 154-159.

The purpose of this study was to evaluate the effects of a telehomecare intervention implemented in an oncology and palliative care unit in Quebec, Canada. As part of the intervention, nurses working within the oncology and

palliative care program were given a tablet PC to use during patients' home visits and capture data related to the patient's encounter. Outcomes of interest were nurses' satisfaction with the software application, perceived quality of care, and individual and group productivity. With regard to productivity, we hypothesized that this system use would increase (1) the number of patients treated by all the nurses involved in the program, (2) the average number of home visits made by a nurse per shift, and (3) the percentage of time nurses spent providing direct care to patients. There was no intention to reduce the number of home visits made to individual patients. In order to assess the effects of the intervention, data collection was performed over three periods, representing the pre-implementation phase and two post-implementation phases, over 8 months. Data were collected using semistructured interviews, questionnaire surveys, and available documents. Findings revealed that nurses showed a positive attitude toward the software application and were satisfied with the quality of the information stored in the system, which appeared to be of great value for recalling patient information during a visit. According to the nurses, the clinical information system increased the completeness and quality of their interventions in the patient's home, mostly in terms of patient assessment, treatment, and education. Finally, in terms of productivity, we observed a significant increase in the number of patients treated by all the nurses ($p = 0.04$), the average number of home visits made by a nurse per shift ($p = 0.02$), and the percentage of time spent by nurses providing direct care ($p = 0.003$). In summary, the telehomecare intervention produced several positive effects that were related to nurses' quality of documentation and productivity.

Pavlidis, N., W. Gatzemeier, et al. (2010). "The masterclass of the european school of oncology: the 'key educational event' of the school." European Journal of Cancer 46(12): 2159-2165.

The European School of Oncology (ESO) Clinical Masterclass is a one-week, full-immersion course, where students and teachers intensively interact with each other. This educational event is designed for medical or clinical oncologists who are defining and orientating their professional careers. Since 2002 nine Masterclasses have been organised in different European cities in which more than 500 oncologists have participated. In this paper, we are presenting data derived from the analysis of the questionnaire distributed to all participants. Copyright 2010 Elsevier Ltd. All rights reserved.

Pearce, S. and S. Pearce (2009). "Policy and practice in teenage and young adult cancer care in England: looking to the future." European Journal of Oncology Nursing 13(3): 149-153.

This paper outlines the current policy and service developments for the provision of cancer care for teenagers, young adults and their families in England. Key implications in terms of the settings and place of care, the centrality of the multidisciplinary team, the improvement of outcomes in TYA cancer care together with psychosocial issues are examined in more depth alongside the existing evidence base. In terms of the development of high quality, accessible

specialist TYA cancer care and the development of a rigorous evidence base for the practice of TYA cancer care the next few years are crucial. The way forward is complex and challenging but the framework is in place in England to comprehensively improve the care and outcomes of teenagers and young adults with cancer. [References: 86]

Pession, A. and R. Rondelli (2008). "Collection and transfer of data: the AIEOP model." Bone Marrow Transplantation 41 Suppl 2: S35-38.

Advanced Multicenter Research (AMR) is a Web-based information technology infrastructure, fully integrated to manage every single part of a clinical trial, but with 'independent' and 'customizable' components to wholly meet each team's requirements. The AIEOP group utilizes AMR for the management and analyses of the majority of the expected nationwide oncology cases and the most common primary immunodeficiencies, and for all the AIEOP protocols, studies and registries centralized at the AIEOP Operation Office. Standard for data quality control is applied to each AIEOP database according to the AMR standard procedures. The AMR AIEOP network represents a model of Information Based Medicine, a crucial tool for well-informed pediatricians, essential to guarantee better childcare in a setting of patients such as children with cancer.

Petrick, N., D. G. Brown, et al. (2008). "Imaging as a tumor biomarker in oncology drug trials for lung cancer: the FDA perspective." Clinical Pharmacology & Therapeutics 84(4): 523-525.

The US Food and Drug Administration (FDA) is committed to working with the oncology community to expedite the drug evaluation process in view of the many promising new oncology drugs under laboratory development and the time and expense required for such new drugs to reach the patient population. One significant advance would be to enable quantitative imaging as a tumor biomarker. The FDA is working with the pharmaceutical industry, academia, and sister stakeholders in the government, primarily through collaborative educational and research efforts, to identify how imaging can serve this function.

Phelps, S. E., G. Wallen, et al. (2009). "Staff development story: Concept mapping: a staff development strategy for enhancing oncology critical thinking." Journal for Nurses in Staff Development - JNSD 25(1): 42-47.

Plaisanu, C., D. Niculae, et al. (2008). "Intelligent information system for treatment response monitoring and prognosis establishment on genital neoplasia patients." Studies in Health Technology & Informatics 137: 190-195.

Cancer is the second death cause in the majority of countries, including Romania. Nowadays the main cause of this very aggressive disease is still unclear, the study of cancer risk factors being the object of research. This article is presenting an intelligent virtual system, which has as a main purpose the monitoring of treatment response at genital area cancer patients as well as the assessment of their life expectancy and prognosis. The intelligent system is being developed by an undergoing national research project and will be

implemented at The Oncology Institute of Bucharest, Romania.

Poltronieri, E., I. Truccolo, et al. (2010). "Science, institutional archives and open access: an overview and a pilot survey on the Italian cancer research institutions." Journal of Experimental & Clinical Cancer Research 29: 168.

BACKGROUND: The Open Archive Initiative (OAI) refers to a movement started around the '90 s to guarantee free access to scientific information by removing the barriers to research results, especially those related to the ever increasing journal subscription prices. This new paradigm has reshaped the scholarly communication system and is closely connected to the build up of institutional repositories (IRs) conceived to the benefit of scientists and research bodies as a means to keep possession of their own literary production. The IRs are high-value tools which permit authors to gain visibility by enabling rapid access to scientific material (not only publications) thus increasing impact (citation rate) and permitting a multidimensional assessment of research findings. METHODS: A survey was conducted in March 2010 to mainly explore the managing system in use for archiving the research finding adopted by the Italian Scientific Institutes for Research, Hospitalization and Health Care (IRCCS) of the oncology area within the Italian National Health Service (Servizio Sanitario Nazionale, SSN). They were asked to respond to a questionnaire intended to collect data about institutional archives, metadata formats and posting of full-text documents. The enquiry concerned also the perceived role of the institutional repository DSpace ISS, built up by the Istituto Superiore di Sanita (ISS) and based on a XML scheme for encoding metadata. Such a repository aims at acting as a unique reference point for the biomedical information produced by the Italian research institutions. An in-depth analysis has also been performed on the collection of information material addressed to patients produced by the institutions surveyed. RESULTS: The survey respondents were 6 out of 9. The results reveal the use of different practices and standard among the institutions concerning: the type of documentation collected, the software adopted, the use and format of metadata and the conditions of accessibility to the IRs. CONCLUSIONS: The Italian research institutions in the field of oncology are moving the first steps towards the philosophy of OA. The main effort should be the implementation of common procedures also in order to connect scientific publications to researchers curricula. In this framework, an important effort is represented by the project of ISS aimed to set a common interface able to allow migration of data from partner institutions to the OA compliant repository DSpace ISS.

Potts, S. J. (2009). "Digital pathology in drug discovery and development: multisite integration." Drug Discovery Today 14(19-20): 935-941.

Digital pathology is an emerging technology that provides an image-based environment for managing and interpreting the information generated from a digitized glass slide, offering substantial improvements in pharmaceutical drug development across discovery, preclinical GLP pathology and oncology clinical trials. Digital pathology is transforming global pharmaceutical research by enabling data sharing to integrate dispersed pharma pathology labs around the

world. This article reviews the stages of multisite digital pathology integration in large pharmaceutical companies, offering suggestions for success and highlighting challenges. [References: 14]

Powell, M. A., V. L. Filiaci, et al. (2010). "Phase II evaluation of paclitaxel and carboplatin in the treatment of carcinosarcoma of the uterus: a Gynecologic Oncology Group study." Journal of Clinical Oncology 28(16): 2727-2731.

PURPOSE: Platinum and taxane compounds have demonstrated activity in uterine carcinosarcoma (malignant mixed Mullerian tumor). Ifosfamide plus paclitaxel is the regimen with established superiority based on a randomized phase III trial conducted through the Gynecologic Oncology Group. However, the toxicity, multiday schedule, and limited activity of this regimen support further development of novel regimens. Our primary objective was to estimate the antitumor activity and toxicity of paclitaxel plus carboplatin in patients with uterine carcinosarcomas. PATIENTS AND METHODS: Eligible patients had advanced stage (III or IV), persistent or recurrent measurable disease, and no prior chemotherapy. Patients received paclitaxel at 175 mg/m(2) intravenously (IV) over 3 hours plus carboplatin (area under the serum concentration-time curve = 6) IV over 30 minutes every 3 weeks until disease progression or until adverse effects occurred. Common Terminology Criteria for Adverse Events v3.0 was used to grade adverse events. RESULTS: Fifty-five patients were entered onto the study with nine being excluded from analysis, leaving 46 evaluable for analysis. Treatment was well tolerated with expected hematologic toxicity and minimal nonhematologic grade 4 toxicity (one cardiovascular and two pain) with 59% of patients completing six or more cycles of chemotherapy. The proportions of patients with confirmed complete and partial responses were 13% and 41%, respectively, resulting in a total overall response rate of 54% (95% CI, 37% to 67%). CONCLUSION: Paclitaxel plus carboplatin demonstrates antitumor activity against uterine carcinosarcoma with acceptable toxicity and warrants further evaluation in phase III randomized trials.

Presant, C. A., L. Bosserman, et al. (2011). "Implementing EHRs in community oncology practices." Oncology (Williston Park) 25(1): 19-20.

Printz, C. (2010). "Technology's role in healthcare reform: oncology will require different electronicmedical records systems." Cancer 116(17): 3983.

Quinn, G. P., B. A. Bell-Ellison, et al. (2008). "A message of hope: creation of the Faces of Lung Cancer project for increasing awareness of clinical trials." European Journal of Cancer Care 17(6): 601-610.

In 2002, the Thoracic Oncology Advocacy Program at H. Lee Moffitt Cancer Center and Research Institute was created with a mission to contribute to the prevention and cure of lung cancer by embracing the patient perspective. In an effort to increase awareness of clinical trials (CTs) and to humanize the CT process, members of the advocacy programme were involved in the creation of the Faces of Lung Cancer project. Twelve lung cancer patients who participated

in a CT, four caregivers of patients who had been on a trial and four thoracic health care professionals were interviewed and photographed by a professional photographer with prior experience in photo-documentary work. Preliminary results indicate just the process of participating in the Faces of Lung Cancer project and creating the photo essay has had a positive impact on the lives of cancer patients and their caregivers. Formal evaluation of the Faces of Lung Cancer project is underway; however, preliminary results indicate that the project is viewed as successful in terms of conveying a message of hope and increasing awareness. By including visual displays, in conjunction with patient interviews, the photo essay is able to generate and blend powerful information and images that provide a richer, more complete portrayal of the context of a patient's experience.

Quint, L. E., D. J. Quint, et al. (2008). "Frequency and spectrum of errors in final radiology reports generated with automatic speech recognition technology." Journal of the American College of Radiology 5(12): 1196-1199.

PURPOSE: Automatic speech recognition technology has a high frequency of transcription errors, necessitating careful proofreading and report editing. The purpose of this study was to determine the frequency and spectrum of significant dictation errors in finalized radiology reports generated with speech recognition technology. METHODS: All 265 radiology reports that were reviewed in preparation for 12 consecutive weekly multidisciplinary thoracic oncology group conferences were examined for significant dictation errors; reports were compared with the corresponding imaging studies. In addition, departmental radiologists were surveyed regarding their estimates of overall and individual report error rates. RESULTS: Two hundred six of 265 (78%) reports contained no significant errors, and 59 (22%) contained errors. Report error rates by individual radiologists ranged from 0% to 100%. There were no significant differences in error rates between native and nonnative English speakers (P > .8) or between reports dictated by faculty members alone and those dictated by trainees and signed by faculty members (P > .3). The most frequent types of errors were wrong-word substitution, nonsense phrases, and missing words. Fifty-five of 88 radiologists (63%) believed that overall error rates did not exceed 10%, and 67 of 88 radiologists (76%) believed that their own individual error rates did not exceed 10%. CONCLUSIONS: More than 20% of our reports contained potentially confusing errors, and most radiologists believed that report error rates were much lower than they actually were. Knowledge of the frequency and spectrum of errors should raise awareness of this issue and facilitate methods for report improvement.

Quintana, Y., A. N. Patel, et al. (2011). "POND4Kids: a web-based pediatric cancer database for hospital-based cancer registration and clinical collaboration." Studies in Health Technology & Informatics 164: 227-231.

The Pediatric Oncology Network Database, POND4Kids (www.pond4kids.org, POND), is an online, multilingual clinical database created for use by pediatric oncology units in countries with limited resources to meet various clinical data

management needs including cancer registration, data collection and changes in treatment outcome. Established as a part of the International Outreach Program at St. Jude Children's Research Hospital in Memphis, Tennessee, POND aims to provide oncology units a tool to store patient data for easy retrieval and analysis and to achieve uniform data collection to facilitate meaningful comparison of information among centers. Currently, POND is being used to store clinical data on thousands of patients and measure their treatment improvement over a period of time. In 2009 POND included more than 100 pediatric oncology units; each has its own virtual private area. A case study of the UNOP Guatemala Clinic's use of POND is presented. On-going challenges at partner sites include inconsistent data collection methods, missing records, training for data managers, and slow or unreliable internet connections.

Rask, M. T., M. L. Jensen, et al. (2009). "Effects of an intervention aimed at improving nurse-patient communication in an oncology outpatient clinic." Cancer Nursing 32(1): E1-11.

In an ever more burdened healthcare system, there is an urgent need to investigate whether patients benefit from the resources allocated to nurses' communication skills training in terms of improved patient outcomes. This study aimed to evaluate a standardized two 2-day (33 hours) communication skills training program in nursing cancer care. Twenty-four nurses in an oncology outpatient clinic participated and were randomly assigned to the intervention program or a control group. A total of 413 patients treated in the clinic during 2 recruitment periods (before and after the communication skills training) completed a questionnaire package assessing the nurse-patient relationship, psychological well-being, and cancer-related self-efficacy. Nurse group differences in change scores between time points (baseline, 1 week, and 3 months after the communication skills training) on measures related to communication and work-related stress were all nonsignificant. Time-by-group analyses of patient data showed no training effect on patient perception of nurse empathy and attentiveness, and we found no training effect on patients' anxious/depressed, angry, or positive mood, as well as no effect on cancer-related self-efficacy. The results were unable to support the hypotheses that nurse communication skills training would be associated with improved nurse and patient outcomes.

Ravdin, P. M. (2010). "The lack, need, and opportunities for decision-making and informational tools to educate primary-care physicians and women about breast cancer chemoprevention." Cancer Prevention Research 3(6): 686-688.

This perspective on Vogel et al. (beginning on page 696 in this issue of the journal) examines tamoxifen and raloxifene prescription patterns and why these agents are little used for breast cancer prevention despite their effectiveness in definitive trials, Food and Drug Administration approval, and American Society of Clinical Oncology Guidelines Committee endorsement for this purpose. The complexity of weighing the positive and negative aspects of the drugs and estimating net benefit is discussed, as is the need for informational resources

such as interactive Internet-based tools to allow better individualized decisions about the options for chemoprevention. 2010 AACR.

Rennie, H. and G. Mackenzie (2010). "The psychosocial oncology learning assessment: a province-wide survey of cancer care providers' learning needs." Journal of Cancer Education 25(2): 206-210.

A psychosocial oncology learning needs assessment was developed and offered online to cancer care providers in a variety of settings across all health regions in British Columbia. The purpose was to better understand the psychosocial learning needs of cancer care providers and to use this knowledge to shape continuing education priorities. Respondents' preferred learning formats, access to technology and barriers to accessing psychosocial learning opportunities were also assessed. Cancer care providers including radiation therapists, social workers, dieticians, pharmacists, physicians and nurses in both community and agency settings were surveyed. Two hundred and sixty-seven people completed the survey. Key learning needs identified included cultural aspects of care, symptom management, treating the anxious patient, self-care for the professional, care of elderly patients, basic cancer-related medical issues surrounding care and ethics. Community respondents indicated more needs than agency respondents. On-site training was the most preferred learning format, and time constraints were the biggest barrier to accessing learning opportunities. Participants had access to technology. Next steps include conducting key informant and focus group interviews to determine if interest in a learning need is the same as a relevant knowledge and practice gap. This research suggests that cancer care providers are interested in learning more about the psychosocial issues related to cancer care.

Ribeiro, R. C., E. Steliarova-Foucher, et al. (2008). "Baseline status of paediatric oncology care in ten low-income or mid-income countries receiving My Child Matters support: a descriptive study." Lancet Oncology 9(8): 721-729.

BACKGROUND: Childhood-cancer survival is dismal in most low-income countries, but initiatives for treating paediatric cancer have substantially improved care in some of these countries. The My Child Matters programme was launched to fund projects aimed at controlling paediatric cancer in low-income and mid-income countries. We aimed to assess baseline status of paediatric cancer care in ten countries that were receiving support (Bangladesh, Egypt, Honduras, Morocco, the Philippines, Senegal, Tanzania, Ukraine, Venezuela, and Vietnam). METHODS: Between Sept 5, 2005, and May 26, 2006, qualitative face-to-face interviews with clinicians, hospital managers, health officials, and other health-care professionals were done by a multidisciplinary public-health research company as a field survey. Estimates of expected numbers of patients with paediatric cancer from population-based data were used to project the number of current and future patients for comparison with survey-based data. 5-year survival was postulated on the basis of the findings of the interviews. Data from the field survey were statistically compared with demographic, health, and socioeconomic data from global health organisations. The main outcomes were

to assess baseline status of paediatric cancer care in the countries and postulated 5-year survival. FINDINGS: The baseline status of paediatric oncology care varied substantially between the surveyed countries. The number of patients reportedly receiving medical care (obtained from survey data) differed markedly from that predicted by population-based incidence data. Management of paediatric cancer and access to care were poor or deficient (ie, nonexistent, unavailable, or inconsistent access for most children with cancer) in seven of the ten countries surveyed, and accurate baseline data on incidence and outcome were very sparse. Postulated 5-year survival were: 5-10% in Bangladesh, the Philippines, Senegal, Tanzania, and Vietnam; 30% in Morocco; and 40-60% in Egypt, Honduras, Ukraine, and Venezuela. Postulated 5-year survival was directly proportional to several health indicators (per capita annual total health-care expenditure [Pearson's r(2)=0.760, p=0.001], per capita gross domestic product [r(2)=0.603, p=0.008], per capita gross national income [r(2)=0.572, p=0.011], number of physicians [r(2)=0.560, p=0.013] and nurses [r(2)=0.506, p=0.032] per 1000 population, and most significantly, annual government health-care expenditure per capita [r(2)=0.882, p<0.0001]). INTERPRETATION: Detailed surveys can provide useful data for baseline assessment of the status of paediatric oncology, but cannot substitute for national cancer registration. Alliances between public, private, and international agencies might rapidly improve the outcome of children with cancer in these countries.

Ripamonti, C. I., C. Piccinelli, et al. (2010). "Modern computer technologies facilitate communication with a young cancer patient." Tumori 96(4): 609-612.

AIM: The aim of this paper is to show how new technologies may help the communication process in clinical practice in a department providing supportive care to patients undergoing cancer treatment. METHOD: Communication via Internet chat between the psychologist and a young man who sees chatting on the Internet as a natural and familiar mode of expression was shown to be useful. RESULTS: The Internet link enabled us to open a communication channel with the patient and to have a conversation that would otherwise have been impossible. CONCLUSIONS: Although verbal communication is the most important way to communicate among people, Internet communications are certainly an opportunity worth exploring, because they may open up new channels for cancer patients whose ability to speak is restricted. We might imagine using this approach in pediatric oncology, with adolescents and preadolescents, and with young adults like the patient discussed here. The case discussed highlights the enormous difference between the mere transfer of information and genuine communication, the latter involving an encounter with the patient.

Roach, P. B., K. K. Roggin, et al. (2009). "Use of a novel, web-based educational platform facilitates intraoperative training in a surgical oncology fellowship program." Annals of Surgical Oncology 16(5): 1100-1107.

INTRODUCTION: Systems for assessing surgical trainee competence must be practical, reliable, and valid. We developed a novel system, the Surgical Training

and Assessment Tool (STAT), for longitudinal competency assessments of surgical trainees' operative performances. We hypothesized the tool would be both practical and reliable within an academic surgical oncology training program. METHODS: Three surgical qualities of our primary interest (knowledge, skill, and independence) and the key technical maneuvers of approximately 200 surgical oncology procedures were defined and organized into hierarchical menus and loaded into a secure, web-based database. After every training case, trainee and attending surgeon electronically submitted evaluations of the trainee's performance, along with comments, and an overall grade. Data on system use and scores were analyzed. RESULTS: Over the first 14 months of use at a university-based surgical oncology fellowship program, 1,029 assessments were recorded (528 attending surgeon, 501 trainee self-assessments). Median time to complete each assessment was 39 s (range 9-532 s, mean 60 s). Knowledge, skill, and independence assessments each demonstrated strong correlation with overall competency grade (Pearson correlations 0.60, 0.76, and 0.69, respectively). Multiple linear regression analysis showed all to be significant predictors of the overall grade (model R (2) = 0.63; test of predictive significance $p < 0.001$ for each). CONCLUSIONS: STAT is a novel system for tracking and assessing trainee operative performance, which is easily integrated into the workflow of an academic surgical oncology department. Our analysis suggests that it is a practical and reliable instrument; its validity is promising and warrants further study.

Roberts, A., R. Gaizauskas, et al. (2008). "Mining clinical relationships from patient narratives." BMC Bioinformatics 9 Suppl 11: S3.

BACKGROUND: The Clinical E-Science Framework (CLEF) project has built a system to extract clinically significant information from the textual component of medical records in order to support clinical research, evidence-based healthcare and genotype-meets-phenotype informatics. One part of this system is the identification of relationships between clinically important entities in the text. Typical approaches to relationship extraction in this domain have used full parses, domain-specific grammars, and large knowledge bases encoding domain knowledge. In other areas of biomedical NLP, statistical machine learning (ML) approaches are now routinely applied to relationship extraction. We report on the novel application of these statistical techniques to the extraction of clinical relationships. RESULTS: We have designed and implemented an ML-based system for relation extraction, using support vector machines, and trained and tested it on a corpus of oncology narratives hand-annotated with clinically important relationships. Over a class of seven relation types, the system achieves an average F1 score of 72%, only slightly behind an indicative measure of human inter annotator agreement on the same task. We investigate the effectiveness of different features for this task, how extraction performance varies between inter- and intra-sentential relationships, and examine the amount of training data needed to learn various relationships. CONCLUSION: We have shown that it is possible to extract important clinical relationships from text, using supervised statistical ML techniques, at levels of accuracy approaching those of

human annotators. Given the importance of relation extraction as an enabling technology for text mining and given also the ready adaptability of systems based on our supervised learning approach to other clinical relationship extraction tasks, this result has significance for clinical text mining more generally, though further work to confirm our encouraging results should be carried out on a larger sample of narratives and relationship types.

Rodrigues, M. J., S. Haberer, et al. (2011). "Internet to boost patient accrual in oncology trials? A multiinstitutional AERIO study." Annals of Oncology 22(2): 490-491.

Rose, J. H., R. Radziewicz, et al. (2008). "A coping and communication support intervention tailored to older patients diagnosed with late-stage cancer." Clinical Interventions In Aging 3(1): 77-95.

As our society ages, increasing numbers of older Americans will be diagnosed and eventually will die of cancer. To date, psycho-oncology interventions for advanced cancer patients have been more successful in reaching younger adult age groups and generally have not been designed to respond to the unique needs and preferences of older patients. Theories and research on successful aging (Baltes and Baltes 1990; Baltes 1997), health information processing style (Miller 1995; Miller et al 2001) and non-directive client-centered therapy (Rogers 1951, 1967), have guided the development of a coping and communication support (CCS) intervention. Key components of this age-sensitive and tailored intervention are described, including problem domains addressed, intervention strategies used and the role of the CCS practitioner. Age group comparisons in frequency of contact, problems raised and intervention strategies used during the first six weeks of follow up indicate that older patients were similar to middle-aged patients in their level of engagement, problems faced and intervention strategies used. Middle-aged patients were more likely to have problems communicating with family members at intervention start up and practical problems as well in follow up contacts. This is the first intervention study specifically designed to be age sensitive and to examine age differences in engagement from the early treatment phase for late-stage cancer through end of life. This tailored intervention is expected to positively affect patients' quality of care and quality of life over time. [References: 125]

Roux, L., A. Tutac, et al. (2009). "A cognitive virtual microscopic framework for knowledge-based exploration of large microscopic images in breast cancer histopathology." Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2009: 3697-3702.

Histopathological examination is a powerful method for prognosis of major diseases such as breast cancer. Analysis of medical images largely remains the work of human experts. Current virtual microscope systems are mainly an emulation of real microscopes with annotation and some image analysis capabilities. However, the lack of effective knowledge management prevents such systems from being computer-aided prognosis platforms. The cognitive virtual microscopic framework, through an extended modeling and use of medical

knowledge, has the capacity to analyse histopathological images and to perform grading of breast cancer, providing pathologists with a robust and traceable second opinion.

Ruland, C. M., J. Starren, et al. (2008). "Participatory design with children in the development of a support system for patient-centered care in pediatric oncology." Journal of Biomedical Informatics 41(4): 624-635.

Developing software for children with severe illness poses a number of design challenges. In this paper we describe participatory design methods used in the development of SISOM, a support system for children with cancer age 7-12 to help children elicit and report their symptoms/problems in a child-friendly, age-adjusted manner, and to assist clinicians at the point of care in addressing and integrating children's reported symptoms and problems in patient care. The particular design challenges in the development of a clinical support tool for seriously ill children are described, followed by the participatory design techniques we used to meet these challenges. Healthy children and children with cancer participated actively in different stages of the design process. We describe how children contributed to the graphical design of the system's interface; selection of understandable, child-friendly terms used in the system; iconic and graphical representations; and its usability. The methods applied helped us to significantly improve and adapt SISOM to children's cognitive and emotional developmental stage. Working with children as partners in the design also provided important insights into the role children can play in participatory design that may be helpful for other system developers who wish to design support applications for ill children. Children had very creative design ideas that considerably improved the software. However, system development for seriously ill children also requires psychological and pedagogical insights and design and usability expertise. This limits the role children can play as full design partners.

Rybovic, M., R. B. Banati, et al. (2008). "Radiation therapy treatment verification imaging in Australia and New Zealand." Journal of Medical Imaging & Radiation Oncology 52(2): 183-190.

An original questionnaire was used to investigate the available types of reference and treatment image verification equipment and specific practices related to image analysis. A section on treatment site-specific imaging was included. The questionnaire was distributed to all radiation oncology facilities in Australia and New Zealand. A response rate of 87% (40/46) was achieved. Most facilities (90%) in Australia and New Zealand reported the availability of electronic portal imaging devices. Use of computer software to assist with image interpretation was indicated by 92% of centres. Frequency of image acquisition and tolerance levels used for radical treatment sites were variable, but palliative treatment site protocols were more consistent between treatment facilities. In conclusion, departments should strive to use evidence-based protocols and guidelines to ensure acceptable accuracy in treatment delivery.

Sairamesh, J., R. Rajagopal, et al. (2009). "Early warning and risk estimation methods

based on unstructured text in electronic medical records to improve patient adherence and care." AMIA Annual Symposium Proceedings/AMIA Symposium 2009: 553-557.

In this paper we present risk-estimation models and methods for early detection of patient non-adherence based on unstructured text in patient records. The primary objectives are to perform early interventions on patients at risk of non-adherence and improve outcomes. We analyzed over 1.1 million visit notes corresponding to 30,095 Cancer patients, spread across 12 years of Oncology practice. Our risk analysis, based on a rich risk-factor dictionary, revealed that a staggering 30% of the patients were estimated to be at a high risk of non-adherence. Our risk classification showed that 2 distinct patient groups, between 26 and 38 (mean risk score, r=0.77, s=0.22), and 75 and 90 (r=0.81, s=0.19) years of age respectively, exhibited the highest risk of nonadherence when compared to the rest. The dominant risk-factors for these two groups, not surprisingly, included psychosocial (e.g. depression, lack of support), medical (e.g. side-effects such as pain) and financial issues (e.g. costs of treatment).

Samulski, M., R. Hupse, et al. (2010). "Using computer-aided detection in mammography as a decision support." European Radiology 20(10): 2323-2330.

OBJECTIVE: To evaluate an interactive computer-aided detection (CAD) system for reading mammograms to improve decision making. METHODS: A dedicated mammographic workstation has been developed in which readers can probe image locations for the presence of CAD information. If present, CAD findings are displayed with the computed malignancy rating. A reader study was conducted in which four screening radiologists and five non-radiologists participated to study the effect of this system on detection performance. The participants read 120 cases of which 40 cases had a malignant mass that was missed at the original screening. The readers read each mammogram both with and without CAD in separate sessions. Each reader reported localized findings and assigned a malignancy score per finding. Mean sensitivity was computed in an interval of false-positive fractions less than 10%. RESULTS: Mean sensitivity was 25.1% in the sessions without CAD and 34.8% in the CAD-assisted sessions. The increase in detection performance was significant (p=0.012). Average reading time was 84.7+/-61.5s/case in the unaided sessions and was not significantly higher when interactive CAD was used (85.9+/-57.8s/case). CONCLUSION: Interactive use of CAD in mammography may be more effective than traditional CAD for improving mass detection without affecting reading time.

Sawyer, J., F. C. Wright, et al. (2008). "Introducing a patient-focused care map in colorectal surgery: a pilot qualitative study of patients' and surgical oncology nurses' experiences." Canadian Oncology Nursing Journal 18(1): 25-33.

Care maps for patient care have been around for many years. Key stakeholders at our institution developed and implemented a care map for patients undergoing surgery for colorectal cancer. The purpose of this descriptive, qualitative pilot study was twofold. First was to understand the lived experience of patients being cared for under a newly-implemented care map utilizing patient diaries and interviews. The second goal was to describe the experiences of surgical

oncology nurses caring for these patients using a focus group technique. The results of our small study indicated that patients appreciated having a document that outlines daily activities and goals, and were anxious to get home, but were disappointed in the discharge planning process. Nurses were positive about the care map overall, but felt they could have contributed more in the development and planning stages of the care map. Overall, the implementation of our patient-centred care map was a success.

Schaefer, A. O., M. Langer, et al. (2010). "Continuously moving table MRI in oncology." Rofo: Fortschritte auf dem Gebiete der Rontgenstrahlen und der Nuklearmedizin 182(11): 954-964.

Magnetic resonance imaging (MRI) with a continuously moving table (CMT) represents a novel method allowing for the seamless acquisition of an extended field-of-view in the z-direction. One option to realize CMT MRI from a technical point of view is based on very fast sequences like echo planar imaging (EPI). Consequently, table translation for signal sampling and image reconstruction can be neglected. The acquisition of different contrasts, however, necessitates table motion correction, either during acquisition or via post-processing. First clinical studies applying fast steady-state imaging already yielded promising results with respect to metastasis detection. Nevertheless, additional equipment has to be installed for table motion and position tracking. In contrast, the subsequently developed sliding multislice (SMS) technique can be implemented without any additional hardware. In clinical studies, the achievable image quality corresponds to stationary sequences. Additionally, the use of SMS for the detection of pulmonary and abdominal metastases appears to be comparable to computed tomography (CT). Due to the relatively short examination times, CMT MRI can be integrated into highly specialized stationary imaging protocols, thus increasing the possibility to combine local staging with thoracoabdominal metastasis screening within one examination. New contrasts like diffusion-weighted imaging (DWI) or Dixon techniques as well as improved workflow including breathing motion compensation and intuitive scout acquisition have already been proposed and will further expand the clinical applications of this technique. CopyrightGeorg Thieme Verlag KG Stuttgart . New York.

Schiarea, S., G. Solinas, et al. (2010). "Secretome analysis of multiple pancreatic cancer cell lines reveals perturbations of key functional networks." Journal of Proteome Research 9(9): 4376-4392.

The cancer secretome is a rich repository in which to mine useful information for both cancer biology and clinical oncology. To help understand the mechanisms underlying the progression of pancreatic cancer, we characterized the secretomes of four human pancreatic ductal adenocarcinoma (PDAC) cell lines versus a normal counterpart. To this end, we used a proteomic workflow based on high-confidence protein identification by mass spectrometry, semiquantitation by a label-free approach, and network enrichment analysis by a system biology tool. Functional networks significantly enriched with PDAC-dysregulated proteins included not only expected alterations within key mechanisms known to be

relevant for tumor progression (e.g., cell-cell/cell-matrix adhesion, extracellular matrix remodeling, and cytoskeleton rearrangement), but also other extensive, coordinated perturbations never observed in pancreatic cancer. In particular, we highlighted perturbations possibly favoring tumor progression through immune escape (i.e., inhibition of the complement system, deficiency of selected proteasome components within the antigen-presentation machinery, and inhibition of T cell cytoxicity), and a defective protein folding machinery. Among the proteins found concordantly oversecreted in all of our PDAC cell lines, many are reportedly overexpressed in pancreatic cancer (e.g., CD9 and Vimentin), while others (PLOD3, SH3L3, PCBP1, and SFRS1) represent novel PDAC-secreted proteins that may be worth investigating.

Schreier, G., J. Messmer, et al. (2009). "A Web-based platform for interdisciplinary biomedical research." Frontiers in Bioscience 14: 2738-2746.

The European Neuroblastoma Group of the International Society for Paediatric Oncology (SIOPEN) is dedicated to the research and treatment of neuroblastoma. The medical research network SIOPEN-R-NET is an extensive web-based European IT network for interdisciplinary biomedical research. The IT infrastructure has been built using state-of-the-art multi-tiered architecture principles. Basic features required for electronic data capture in clinical trials were implemented. Additionally, advanced tools were developed for registration, review, user management, communication and image management. Currently three clinical trials and eight supporting scientific studies are implemented. The medical research network is already in use by 345 active users from 240 institutions in 18 countries. More than 960 000 item entries and 7962 images from 1260 patients are stored. Challenges, which resulted from the fact that only 16 % of the centres had more than 2 patients per year, have been addressed by an intuitive user interface, hierarchical roles, user required features, and experienced support. The system has already been used extensively and has helped to make significant progress in the area of Neuroblastoma research.

Scott, E., U. Borate, et al. (2008). "Pain management practices by internal medicine residents--a comparison before and after educational and institutional interventions." American Journal of Hospice & Palliative Medicine 25(6): 431-439.

We aimed to improve internal medicine residents' deficiencies in pain management and evaluate the effectiveness of our intervention, which included an interactive conference series, e-mail vignettes, and didactic sessions. An anonymous survey was administered at the beginning and at the end of an academic year, before and after the intervention, respectively. We analyzed 65 preintervention and 63 postintervention surveys. Self-perception of competency in pain management increased from 40% to 60% (P = .02). Perception of adequacy of training increased from 38.5% to 55.6% (P = .05). Opioid conversion skills improved by 25% (P = .02). Overall, knowledge did not change significantly, except in the subgroup of residents who had completed the oncology rotation from 0.60 to 0.72 (P = .003). "Opiophobia" improved by 20% (P = .05). Documentation of pain improved (rank correlation = 21; P = .02). We concluded

that educational and institutional interventions administered over an academic year improved pain management skills and documentation and reduced "opiophobia" among residents.

Scrucca, L., A. Santucci, et al. (2010). "Regression modeling of competing risk using R: an in depth guide for clinicians." Bone Marrow Transplantation 45(9): 1388-1395.

We describe how to conduct a regression analysis for competing risks data. The use of an add-on package for the R statistical software is described, which allows for the estimation of the semiparametric proportional hazards model for the subdistribution of a competing risk analysis as proposed by Fine and Gray. J Am Stat Assoc 1999; 94: 496-509.

Sechopoulos, I., C. J. D'Orsi, et al. (2008). "Glandular radiation dose in tomosynthesis of the breast using tungsten targets." Journal of Applied Clinical Medical Physics 9(4): 2887.

With the advent of new detector technology, digital tomosynthesis imaging of the breast has, in the past few years, become a technique intensely investigated as a replacement for planar mammography. As with all other x-ray-based imaging methods, radiation dose is of utmost concern in the development of this new imaging technology. For virtually all development and optimization studies, knowledge of the radiation dose involved in an imaging protocol is necessary. A previous study characterized the normalized glandular dose in tomosynthesis imaging and its variation with various breast and imaging system parameters. This characterization was performed with x-ray spectra generated by molybdenum and rhodium targets. In the recent past, many preliminary patient studies of tomosynthesis imaging have been reported in which the x-ray spectra were generated with x-ray tubes with tungsten targets. The differences in x-ray distribution among spectra from these target materials make the computation of new normalized glandular dose values for tungsten target spectra necessary. In this study we used previously obtained monochromatic normalized glandular dose results to obtain spectral results for twelve different tungsten target x-ray spectra. For each imaging condition, two separate values were computed: the normalized glandular dose for the zero degree projection angle (DgN0), and the ratio of the glandular dose for non-zero projection angles to the glandular dose for the zero degree projection (the relative glandular dose, RGD(alpha)). It was found that DgN0 is higher for tungsten target x-ray spectra when compared with DgN0 values for molybdenum and rhodium target spectra of both equivalent tube voltage and first half value layer. Therefore, the DgN0 for the twelve tungsten target x-ray spectra and different breast compositions and compressed breast thicknesses simulated are reported. The RGD(alpha) values for the tungsten spectra vary with the parameters studied in a similar manner to that found for the molybdenum and rhodium target spectra. The surface fit equations and the fit coefficients for RGD(alpha) included in the previous study were also found to be appropriate for the tungsten spectra.

Servodidio, C. A. and C. A. Servodidio (2008). "Nurses describe how technology affects

their oncology nursing practice." ONS Connect 23(7): 15.

Sevean, P., S. Dampier, et al. (2008). "Bridging the distance: educating nurses for telehealth practice." Journal of Continuing Education in Nursing 39(9): 413-418.

BACKGROUND: The aim of this research project was to explore the impact of telehealth technology on health assessments performed by nurses delivering health services to isolated populations. METHOD: Nurses performing preoperative and oncology assessments for clients in remote communities via telehealth received training. Education workshops were delivered to nurses (N = 37) in 13 communities across Northwestern Ontario. RESULTS/CONCLUSION: Presurveys and postsurveys indicated that the nurses were receptive to the mode of delivery and the content was relevant to their telehealth practice.

Sharma, Y., S. H. Raza, et al. (2008). "PASuite: a preprocessing algorithm suite for cellular and molecular image classification in cancer diagnosis and treatment." Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2008: 3114-3117.

We present a generalized tool to mark and preprocess cancerous regions in an image. Currently, tissue biopsies are analyzed and graded manually by expert pathologists and thus can be time consuming and challenging due to variations in tissue morphology, inconsistencies in preparation of tissue specimen and errors in the image acquisition process. Our tool is designed to automatically standardize the variations in different images due to changing illumination and experimental conditions. Segregating cancerous regions from non-cancerous areas is a mandatory step before extracting relevant information from cancer images such as the number and size of nuclei and subsequently using it for classification and quantitative analysis. We tested our tool for two completely different cancers: Head and Neck Cancer (HNC) and Renal Cell Carcinoma (RCC). The tool enables the user to successfully segment the cancerous areas for both types of cancers and our results match with the manual validation by a pathologist.

Sheridan-Leos, N. and N. Sheridan-Leos (2008). "Oncology care setting design and planning part I: Concepts for the oncology nurse that improve patient safety." Clinical Journal of Oncology Nursing 12(2): 361-363.

Shiraishi, J., K. Sugimoto, et al. (2008). "Computer-aided diagnosis for the classification of focal liver lesions by use of contrast-enhanced ultrasonography." Medical Physics 35(5): 1734-1746.

The authors developed a computer-aided diagnostic (CAD) scheme for classifying focal liver lesions (FLLs) as liver metastasis, hemangioma, and three histologic differentiation types of hepatocellular carcinoma (HCC), by use of microflow imaging (MFI) of contrast-enhanced ultrasonography. One hundred and three FLLs obtained from 97 cases used in this study consisted of 26 metastases (15 hyper- and 11 hypovascularity types), 16 hemangiomas (five hyper- and 11 hypovascularity types) and 61 HCCs: 24 well differentiated (w-

HCC), 28 moderately differentiated (m-HCC), and nine poorly differentiated (p-HCC). Pathologies of all cases were determined based on biopsy or surgical specimens. Locations and contours of FLLs on contrast-enhanced images were determined manually by an experienced physician. MFI was obtained with contrast-enhanced low-mechanical-index (MI) pulse subtraction imaging at a fixed plane which included a distinctive cross section of the FLL. In MFI, the inflow high signals in the plane, which were due to the vascular patterns and the contrast agent, were accumulated following flash scanning with a high-MI ultrasound exposure. In the initial step of our computerized scheme, a series of the MFI images was extracted from the original cine clip (AVI format). We applied a smoothing filter and time-sequential running average techniques in order to reduce signal noise on the single MFI image and cyclic noise on the sequential MFI images, respectively. A kidney, vessels, and a liver parenchyma region were segmented automatically by use of the last image of a series of MFI images. The authors estimated time-intensity curves for an FLL by use of a series of the temporally averaged MFI images in order to determine temporal features such as estimated replenishment times at early and delayed phases, flow rates, and peak times. In addition, they extracted morphologic and gray-level image features which were determined based on the physicians' knowledge of the diagnosis of the FLL, such as the size of lesion, vascular patterns, and the presence of hypoechoic regions. They employed a cascade of six independent artificial neural networks (ANNs) by use of extracted temporal and image features for classifying five types of liver diseases. A total of 16 temporal and image features, which were selected from 43 initially extracted features, were used for six different ANNs for making decisions at each decision in the cascade. The ANNs were trained and tested with a leave-one-lesion-out test method. The classification accuracies for the 103 FLLs were 88.5% for metastasis, 93.8% for hemangioma, and 86.9% for all HCCs. In addition, the classification accuracies for histologic differentiation types of HCCs were 79.2% for w-HCC, 50.0% for m-HCC, and 77.8% for p-HCC. The CAD scheme for classifying FLLs by use of the MFI on contrast-enhanced ultrasonography has the potential to improve the diagnostic accuracy in the histologic diagnosis of HCCs and the other liver diseases.

Shironoshita, E. P., Y. R. Jean-Mary, et al. (2008). "semCDI: a query formulation for semantic data integration in caBIG." Journal of the American Medical Informatics Association 15(4): 559-568.

OBJECTIVES: To develop mechanisms to formulate queries over the semantic representation of cancer-related data services available through the cancer Biomedical Informatics Grid (caBIG). DESIGN: The semCDI query formulation uses a view of caBIG semantic concepts, metadata, and data as an ontology, and defines a methodology to specify queries using the SPARQL query language, extended with Horn rules. semCDI enables the joining of data that represent different concepts through associations modeled as object properties, and the merging of data representing the same concept in different sources through Common Data Elements (CDE) modeled as datatype properties, using Horn rules to specify additional semantics indicating conditions for merging data.

Validation In order to validate this formulation, a prototype has been constructed, and two queries have been executed against currently available caBIG data services. DISCUSSION: The semCDI query formulation uses the rich semantic metadata available in caBIG to build queries and integrate data from multiple sources. Its promise will be further enhanced as more data services are registered in caBIG, and as more linkages can be achieved between the knowledge contained within caBIG's NCI Thesaurus and the data contained in the Data Services. CONCLUSION: semCDI provides a formulation for the creation of queries on the semantic representation of caBIG. This constitutes the foundation to build a semantic data integration system for more efficient and effective querying and exploratory searching of cancer-related data.

Siemaszkiewicz, L. and L. Siemaszkiewicz (2008). "NICE and The Lancet Oncology join forces." Lancet Oncology 9(4): 313-314.

Simone, C. B., 2nd, N. Vapiwala, et al. (2008). "Internet-based survey evaluating use of pain medications and attitudes of radiation oncology patients toward pain intervention." International Journal of Radiation Oncology, Biology, Physics 72(1): 127-133.

PURPOSE: Pain is a common symptom among cancer patients, yet many patients do not receive adequate pain management. Few data exist quantifying analgesic use by radiation oncology patients. This study evaluated the causes of pain in cancer patients and investigated the reasons patients fail to receive optimal analgesic therapy. METHODS AND MATERIALS: An institutional review board-approved, Internet-based questionnaire assessing analgesic use and pain control was posted on the OncoLink (available at www.oncolink.org) Website. Between November 2005 and April 2006, 243 patients responded. They were predominantly women (73%), white (71%), and educated beyond high school (67%) and had breast (38%), lung (6%), or ovarian (6%) cancer. This analysis evaluated the 106 patients (44%) who underwent radiotherapy. RESULTS: Of the 106 patients, 58% reported pain from their cancer treatment, and 46% reported pain directly from their cancer. The pain was chronic in 51% and intermittent in 33%. Most (80%) did not use medication to manage their pain. Analgesic use was significantly less in patients with greater education levels (11% vs. 36%, $p = 0.002$), with a trend toward lower use by whites (16% vs. 32%, $p = 0.082$) and women (17% vs. 29%, $p = 0.178$). The reasons for not taking analgesics included healthcare provider not recommending medication (87%), fear of addiction or dependence (79%), and inability to pay (79%). Participants experiencing pain, but not taking analgesics, pursued alternative therapies for relief. CONCLUSIONS: Many radiation oncology patients experience pain from their disease and cancer treatment. Most study participants did not use analgesics because of concerns of addiction, cost, or failure of the radiation oncologist to recommend medication. Healthcare providers should have open discussions with their patients regarding pain symptoms and treatment.

Simpson, C. D., J. Gao, et al. (2008). "Routine bone marrow examination in the initial evaluation of paediatric Hodgkin lymphoma: the Canadian perspective." British Journal

of Haematology 141(6): 820-826.

Bone marrow examination (BME) in paediatric Hodgkin lymphoma (HL) was evaluated, as evidence from adult HL suggests it may be unnecessary. An internet-based survey was used to examine the practice of Canadian paediatric oncologists regarding BME in children and the impact of routine BME was evaluated in patients with HL treated at our institution. Sixteen of 17 paediatric oncology centres were represented. Forty-three percent of eligible doctors completed the survey. Routine BME for stages III and IV disease was consistent nationally. By contrast, 54% and 70% of respondents reported performing routine BME for stages I and II HL respectively. Respondents were more likely to report performing routine BME in low-stage HL if trained outside Canada (P = 0.04, stage I; P = 0.07, stage II) or practicing at smaller centres (P = 0.05, stage I; P = 0.03, stage II). At our institution, 62 patients were eligible for analysis. Only four patients (6.5%) had a positive BME. Anaemia was the only significant risk factor (P = 0.006). No patient with otherwise low stage was found to have marrow involvement. Comparison of staging with and without BME demonstrated no significant difference to final risk classification. BME in paediatric patients with low-stage HL has extremely low yield and may be unnecessary.

Siochi, R. A., P. Balter, et al. (2009). "Information technology resource management in radiation oncology." Journal of Applied Clinical Medical Physics 10(4): 3116.

The ever-increasing data demands in a radiation oncology (RO) clinic require medical physicists to have a clearer understanding of the information technology (IT) resource management issues. Clear lines of collaboration and communication among administrators, medical physicists, IT staff, equipment service engineers and vendors need to be established. In order to develop a better understanding of the clinical needs and responsibilities of these various groups, an overview of the role of IT in RO is provided. This is followed by a list of IT related tasks and a resource map. The skill set and knowledge required to implement these tasks are described for the various RO professionals. Finally, various models for assessing one's IT resource needs are described. The exposition of ideas in this white paper is intended to be broad, in order to raise the level of awareness of the RO community; the details behind these concepts will not be given here and are best left to future task group reports.

Sisler, J. and P. McCormack-Speak (2009). "Bridging the gap between primary care and the cancer system: the UPCON Network of CancerCare Manitoba." Canadian Family Physician 55(3): 273-278.

PROBLEM BEING ADDRESSED: Patient care is poorly coordinated between family physicians and the cancer system and the working relationships are not strong. OBJECTIVE OF PROGRAM: To improve integration of patient care and communication between FPs and cancer specialists; enhance FPs' knowledge of cancer and the cancer system; and promote the role of primary care within the cancer care system. PROGRAM DESCRIPTION: The Uniting Primary Care and Oncology (UPCON) Network of CancerCare Manitoba has created partnerships with 12 primary care clinics in Winnipeg, Man, by providing the following: access

to the provincial electronic medical record for cancer; small group continuing professional development for a "lead physician" from each clinic to make him or her the local cancer resource; educational outreach to all clinic staff; and changes within CancerCare Manitoba to highlight the role of FPs. CONCLUSION: Lead physicians are appreciated by their clinic colleagues, and these FPs are the main users of the cancer electronic medical record. A strong cancer continuing professional development program has been implemented and a voice for primary care has been created within the agency. The UPCON Network is now expanding throughout Manitoba. [References: 22]

Smith, A. P., M. Y. Lichtveld, et al. (2009). "A competency-based approach to expanding the cancer care workforce: proof of concept." MEDSURG Nursing 18(1): 38-49; quiz 50.

As part of an effort to address shortages in the cancer workforce, C-Change developed competency standards and logic model-driven implementation tools for strengthening the cancer knowledge and skills of non-oncology health professionals. Testing of these standards and tools at four diverse pilot sites yielded very promising results.

Snyder, C. F., R. Jensen, et al. (2009). "PatientViewpoint: a website for patient-reported outcomes assessment." Quality of Life Research 18(7): 793-800.

PURPOSE: To develop a prototype website to collect patient-reported outcomes in outpatient clinical oncology and link the data with the electronic medical record (EMR). METHODS: A multidisciplinary Research Network, including experts in outcomes research, clinical oncology, nursing, social work, information technology, EMRs, behavioral science, decision science, clinical trials, law, and a cancer survivor, was formed to design the prototype website. The Research Network developed the initial website specifications, elicited feedback from patients (n = 20) and clinicians (n = 7), constructed the website, and conducted usability testing (n = 10). RESULTS: Clinicians reported that the website could improve clinical practice if it was not burdensome and were most interested in tracking change over time. Patients were interested in using the website because of the potential to facilitate communication with their clinicians. Patients emphasized the importance of short and simple surveys and a user-friendly interface. The PatientView-oint website was designed to meet these specifications. Usability testing suggested that patients had few problems accessing and using the site. CONCLUSIONS: Preliminary reports from clinicians and patients suggest that a website to collect PROs and link them with the EMR could help improve the quality of cancer care. Further pilot-testing will evaluate the use, usefulness, and acceptability of PatientViewpoint.

Soo, K. C. (2008). "Role of comprehensive cancer centres during economic and disease transition: National Cancer Centre, Singapore--a case study." Lancet Oncology 9(8): 796-802.

In 1999, Singapore created a comprehensive cancer centre because of the rising occurrence of cancer in the country. Although Singapore is different from many

developing countries because of its small geographical size and its well-endowed economy, it has issues that are common to any country or community wanting to start such centres. We present our experience of developing a comprehensive cancer centre. We located the cancer centre strategically adjacent to Singapore's largest hospital. Clinics were designed to provide multidisciplinary care, and site-specific radiation, medical, and surgical oncologists could consult with patients on the same day and at the multidisciplinary outpatient clinics. We developed a large research team and ensured that tumour specimens were carefully obtained and annotated in our tissue repository. Furthermore, we are building up a robust cancer informatics system as well as a pipeline of specialists with local training and overseas stints at other top cancer centres.

Suzuki, K., Y. Hirasawa, et al. (2009). "A web-based remote radiation treatment planning system using the remote desktop function of a computer operating system: a preliminary report." Journal of Telemedicine & Telecare 15(8): 414-418.

We developed a web-based, remote radiation treatment planning system which allowed staff at an affiliated hospital to obtain support from a fully staffed central institution. Network security was based on a firewall and a virtual private network (VPN). Client computers were installed at a cancer centre, at a university hospital and at a staff home. We remotely operated the treatment planning computer using the Remote Desktop function built in to the Windows operating system. Except for the initial setup of the VPN router, no special knowledge was needed to operate the remote radiation treatment planning system. There was a time lag that seemed to depend on the volume of data traffic on the Internet, but it did not affect smooth operation. The initial cost and running cost of the system were reasonable.

Taira, R. K., A. Bui, et al. (2008). "A tool for improving the longitudinal imaging characterization for neuro-oncology cases." AMIA Annual Symposium Proceedings/AMIA Symposium.: 712-716.

We describe the development of a prototype tool for the construction of longitudinal cases studies that can be used for teaching files, construction of clinical databases, and for patient education. The test domain is neuro-oncology. The features of the tool include: 1) natural language processing tools to assist structuring report information; 2) integration of imaging data; 3) integration of drug information; 4) target data model that includes the dimensions of space, time, existence, and causality; 5) user interface that provides three levels of information including overview, filtered summarization, and details on demand. The results of this preliminary work include a full prototype for neuro-oncology patients that allow users an efficient means for scanning a patients imaging and support data.

Tang, L., G. Hamarneh, et al. (2008). "Validation of mutual information-based registration of CT and bone SPECT images in dual-isotope studies." Computer Methods & Programs in Biomedicine 92(2): 173-185.

The registration of computed tomography (CT) and nuclear medicine (NM)

images can substantially enhance patient diagnosis as it allows for the fusion of anatomical and functional information, as well as the attenuation correction of NM images. However, irrespective of the method used, registration accuracy depends heavily on the characteristics of the images that are registered and the degree of similarity between them. This poses a challenge for registering CT and NM images as they have very different characteristics and content. To address the particular problem of registering single photon emission computed tomography (SPECT) oncology studies with corresponding CT, we have proposed to perform a dual-isotope study with simultaneous injection of a tumor tracer and a bone imaging agent to obtain a tumor SPECT and a bone SPECT image that are inherently registered. As bone structures are generally visible in both CT and bone SPECT, performing registration of these images will be more easily attainable than registration of CT and tumor SPECT. By subsequently applying the spatial transformation determined from this registration to the tumor SPECT acquired from the same dual-isotope study, the optimal alignment between the CT and tumor SPECT images can be obtained. In this paper, we present the proof-of-concept of the proposed approach, the MI-based algorithm employed, and the techniques used to select the algorithm's parameters. Our objectives are to show the feasibility of CT and bone SPECT registration using this algorithm and to validate quantitatively the results generated using clinical data.

Tariman, J. D. (2008). "Technologic advancements in cancer care. Changing practice, changing patients' lives." ONS Connect 23(7): 8-12.

Tariman, J. D., D. L. Berry, et al. (2011). "Validation and testing of the Acceptability E-scale for web-based patient-reported outcomes in cancer care." Applied Nursing Research 24(1): 53-58.

The performance of the Acceptability E-scale was tested in a sample of 627 adult and older adult patients from various oncology clinics who completed an electronic symptoms survey. The revised Acceptability E-scale has strong psychometric properties and can be useful in assessing the acceptability and usability of computerized health-related programs in oncology and other health population. Copyright Copyright 2011. Published by Elsevier Inc.

Temel, J. S., J. A. Greer, et al. (2010). "Code status documentation in the outpatient electronic medical records of patients with metastatic cancer." Journal of General Internal Medicine 25(2): 150-153.

BACKGROUND: Advanced care planning (ACP) is considered an essential component of medical care in the United States, especially in patients with incurable diseases. However, little is known about clinical practices in outpatient oncology settings related to discussing end-of-life care and documenting code status preferences in ambulatory medical records. OBJECTIVE: To assess the rate of documentation of code status in the electronic longitudinal medical records (LMR) of patients with metastatic cancer. DESIGN: Retrospective review of 2,498 patients with metastatic solid tumors at an academic cancer center. An

electronic patient database and the LMR were queried to identify demographic information, cancer type, number of clinic visits, and documentation of code status. PARTICIPANTS: The sample consisted of adult patients with metastatic prostate, breast, ovarian, bladder kidney, colorectal, non-colorectal gastrointestinal (GI), and lung cancers. MEASUREMENTS: Primary outcome was the percentage of documented code status in the LMR. MAIN RESULTS: Among the 2,498 patients, 20.3% had a documented code status. Code status was designated most frequently in patients with non-colorectal GI (193/609, 31.7%) and lung (179/583, 30.7%) cancers and least frequently in patients with genitourinary malignancies [bladder/kidney (4/89, 4.5%), ovarian (4/93, 4.3%), and prostate (7/365, 1.9%) cancers]. Independent predictors of having documented code status included religious affiliation, cancer type, and a greater number of visits to the cancer center. Younger patients and black patients were less likely to be designated as DNR/DNI. CONCLUSIONS: Despite the incurable nature of metastatic cancer, only a minority of patients had a code status documented in the electronic medical record.

Thomas, D. G., R. V. Pappu, et al. (2009). "Ontologies for cancer nanotechnology research." Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2009: 4158-4161.

Cancer nanotechnology research data are diverse. Ontologies that provide a unifying knowledge framework for annotation of data are necessary to facilitate the sharing and semantic integration of data for advancing the research via informatics methods. In this work, we report the development of NanoParticle Ontology (NPO) to support the terminological and informatics needs of cancer nanotechnology. The NPO is developed within the framework of the Basic Formal Ontology (BFO) using well-defined principles, and implemented in the Ontology Web Language (OWL). The NPO currently represents entities related to physical, chemical and functional descriptions of nanoparticles that are formulated and tested for applications in cancer diagnostics and therapeutics. Public releases of the NPO are available through the BioPortal web site, maintained by the National Center for Biomedical Ontology. Expansion of the scope and application of the NPO will depend on the needs of and feedback from the user community, and its adoption in nanoparticle database applications. As the NPO continues to grow, it will require a governance structure and well-organized community effort for the maintenance, review and development of the NPO.

Truccolo, I., A. Bogliolo, et al. (2011). "CIGNOweb.it." Tumori 97(1): 133-135.

We introduce CIGNOweb.it, a database of oncology resources for patients, the general public and healthcare professionals. It builds on the previous Italian cancer resource Azaleaweb and offers quality-evaluated content. It meets international bibliographic and technical standards such as the Open Archives Initiative (OAI) for web content interoperability and the Functional Requirements for Bibliographic Records (FRBR) for bibliographic description with respect to the different media, applications, and user needs. Database content is supplied in

collaboration with non-profit associations, libraries and the network of Cancer Information Points that is currently being established all over Italy. Expert and customer evaluation and feedback are provided for in the system. The graphic layout has been painstakingly designed to be user-friendly for a non-expert public. CIGNOweb.it is multicentric and will in time offer health information outside the field of oncology. It is designed to become a multilingual tool to organize, optimize and access patient information produced in the languages of the "newer" European countries. It is hoped that CIGNOweb.it will support other European nations in enhancing the structure and organization of their own-language patient health information and will contribute towards making a common health information portal of the European Union a reality.

Tuckwell, W., E. Bezak, et al. (2008). "Efficient Monte Carlo modelling of individual tumour cell propagation for hypoxic head and neck cancer." Physics in Medicine & Biology 53(17): 4489-4507.

A Monte Carlo tumour model has been developed to simulate tumour cell propagation for head and neck squamous cell carcinoma. The model aims to eventually provide a radiobiological tool for radiation oncology clinicians to plan patient treatment schedules based on properties of the individual tumour. The inclusion of an oxygen distribution amongst the tumour cells enables the model to incorporate hypoxia and other associated parameters, which affect tumour growth. The object oriented program FORTRAN 95 has been used to create the model algorithm, with Monte Carlo methods being employed to randomly assign many of the cell parameters from probability distributions. Hypoxia has been implemented through random assignment of partial oxygen pressure values to individual cells during tumour growth, based on in vivo Eppendorf probe experimental data. The accumulation of up to 10 million virtual tumour cells in 15 min of computer running time has been achieved. The stem cell percentage and the degree of hypoxia are the parameters which most influence the final tumour growth rate. For a tumour with a doubling time of 40 days, the final stem cell percentage is approximately 1% of the total cell population. The effect of hypoxia on the tumour growth rate is significant. Using a hypoxia induced cell quiescence limit which affects 50% of cells with and oxygen levels less than 1 mm Hg, the tumour doubling time increases to over 200 days and the time of tumour growth for a clinically detectable tumour (10(9) cells) increases from 3 to 8 years. A biologically plausible Monte Carlo model of hypoxic head and neck squamous cell carcinoma tumour growth has been developed for real time assessment of the effects of multiple biological parameters which impact upon the response of the individual patient to fractionated radiotherapy.

Ulin, K., M. M. Urie, et al. (2010). "Results of a multi-institutional benchmark test for cranial CT/MR image registration." International Journal of Radiation Oncology, Biology, Physics 77(5): 1584-1589.

PURPOSE: Variability in computed tomography/magnetic resonance imaging (CT/MR) cranial image registration was assessed using a benchmark case developed by the Quality Assurance Review Center to credential institutions for

participation in Children's Oncology Group Protocol ACNS0221 for treatment of pediatric low-grade glioma. METHODS AND MATERIALS: Two DICOM image sets, an MR and a CT of the same patient, were provided to each institution. A small target in the posterior occipital lobe was readily visible on two slices of the MR scan and not visible on the CT scan. Each institution registered the two scans using whatever software system and method it ordinarily uses for such a case. The target volume was then contoured on the two MR slices, and the coordinates of the center of the corresponding target in the CT coordinate system were reported. The average of all submissions was used to determine the true center of the target. RESULTS: Results are reported from 51 submissions representing 45 institutions and 11 software systems. The average error in the position of the center of the target was 1.8 mm (1 standard deviation = 2.2 mm). The least variation in position was in the lateral direction. Manual registration gave significantly better results than did automatic registration ($p = 0.02$). CONCLUSION: When MR and CT scans of the head are registered with currently available software, there is inherent uncertainty of approximately 2 mm (1 standard deviation), which should be considered when defining planning target volumes and PRVs for organs at risk on registered image sets. Copyright 2010 Elsevier Inc. All rights reserved.

Valent, P., T. Lion, et al. (2008). "Diagnostic algorithms, monitoring, prognostication, and therapy in chronic myeloid leukemia (CML): a proposal of the Austrian CML platform." Wiener Klinische Wochenschrift 120(21-22): 697-709.

Chronic myeloid leukemia (CML) is a stem cell disease characterized by the BCR/ABL oncoprotein. The ABL kinase inhibitor imatinib is effective in most patients and considered standard first-line therapy. However, not all patients show a long-lasting response to this drug. In fact, resistance against imatinib has been described and is an emerging clinical problem in CML. For these patients, novel multi-kinase inhibitors such as nilotinib or dasatinib as well as stem cell transplantation, represent alternative treatment options. The decision concerning second-line therapies and selection of drugs is usually based on the presence and type of BCR/ABL mutations, the phase of disease, other disease-related factors as well as patient-related factors including age, co-morbidity, and pharmacologic determinants. The current article provides an overview on diagnostic and therapeutic strategies for patients with treatment-naive and imatinib-resistant CML, together with proposed algorithms that were discussed and approved by members of the CML platform of the Austrian Society for Hematology and Oncology (OGHO) in 2007 and 2008. The resulting recommendations should assist in diagnosis and prognostication in CML, follow-up and disease-monitoring, patient selection for interventional therapies, and in the preparation and conduct of clinical trials.

van Buuren, S. and J. C. Ooms (2009). "Stage line diagram: an age-conditional reference diagram for tracking development." Statistics in Medicine 28(11): 1569-1579.

This paper presents a method for calculating stage line diagrams, a novel type of reference diagram useful for tracking developmental processes over time.

Potential fields of applications include: dentistry (tooth eruption), oncology (tumor grading, cancer staging), virology (HIV infection and disease staging), psychology (stages of cognitive development), human development (pubertal stages) and chronic diseases (stages of dementia). Transition probabilities between successive stages are modeled as smoothly varying functions of age. Age-conditional references are calculated from the modeled probabilities by the mid-P value. It is possible to eliminate the influence of age by calculating standard deviation scores (SDS). The method is applied to the empirical data to produce reference charts on secondary sexual maturation. The mean of the empirical SDS in the reference population is close to zero, whereas the variance depends on age. The stage line diagram provides quick insight into both status (in SDS) and tempo (in SDS/year) of development of an individual child. Other measures (e.g. height SDS, body mass index SDS) from the same child can be added to the chart. Diagrams for sexual maturation are available as a web application at http://vps.stefvanbuuren.nl/puberty. The stage line diagram expresses status and tempo of discrete changes on a continuous scale. Wider application of these measures scores opens up new analytic possibilities. (c) 2009 John Wiley & Sons, Ltd.

van de Bosch, J., R. Atiqi, et al. (2010). "Time-dependent predictors in clinical research, performance of a novel method." American Journal of Therapeutics 17(6): e202-207.

Individual patients' predictors of survival may change across time, because people may change their lifestyles. Standard statistical methods do not allow adjustments for time-dependent predictors. In the past decade, time-dependent factor analysis has been introduced as a novel approach adequate for the purpose. Using examples from survival studies, we assess the performance of the novel method. SPSS statistical software is used (SPSS Inc., Chicago, IL). Cox regression is a major simplification of real life; it assumes that the ratio of the risks of dying in parallel groups is constant over time. It is, therefore, inadequate to analyze, for example, the effect of elevated low-density lipoprotein cholesterol on survival, because the relative hazard of dying is different in the first, second, and third decades. The time-dependent Cox regression model allowing for nonproportional hazards is applied and provides a better precision than the usual Cox regression (P = 0.117 versus 0.0001). Elevated blood pressure produces the highest risk at the time it is highest. An overall analysis of the effect of blood pressure on survival is not significant, but after adjustment for the periods with highest blood pressures using the segmented time-dependent Cox regression method, blood pressure is a significant predictor of survival (P = 0.04). In a long-term therapeutic study, treatment modality is a significant predictor of survival, but after the inclusion of the time-dependent low-density lipoprotein cholesterol variable, the precision of the estimate improves from a P value of 0.02 to 0.0001. Predictors of survival may change across time, e.g., the effect of smoking, cholesterol, and increased blood pressure in cardiovascular research and patients' frailty in oncology research. Analytical models for survival analysis adjusting such changes are welcome. The time-dependent and segmented time-dependent predictors are adequate for the purpose. The usual multiple Cox

regression model can include both time-dependent and time-independent predictors.

van den Akker, P. A., K. B. Kluivers, et al. (2010). "Letter to the editor concerning "Increasing the effectiveness of referral of ovarian masses from cancer unit to cancer center by using a higher referral value of the risk of malignancy index"." International Journal of Gynecological Cancer 20(8): 1303.

van Uden-Kraan, C. F., C. H. Drossaert, et al. (2010). "Experiences and attitudes of Dutch rheumatologists and oncologists with regard to their patients' health-related Internet use." Clinical Rheumatology 29(11): 1229-1236.

The objective of this study is to explore the experiences and attitudes of rheumatologists and oncologists with regard to their patients' health-related Internet use. In addition, we explored how often physicians referred their patients to health-related Internet sites. We sent a questionnaire to all the rheumatologists and oncologists in the Netherlands. The questionnaire included questions concerning demographics, experiences with patients' health-related Internet use, referral behavior, and attitudes to the consequences of patients' health-related Internet use (for patients themselves, the physician-patient relationship and the health care). The response rate was 46% (N=238). Of these respondents, 134 practiced as a rheumatologist and 104 as an oncologist. Almost all physicians encountered their patients raising information from the Internet during a consultation. They were not, however, confronted with their patients' health-related Internet use on a daily basis. Physicians had a moderately positive attitude towards the consequences of patients' health-related Internet use, the physician-patient relationship and the health care. Oncologists were significantly less positive than rheumatologists about the consequences of health-related Internet use. Most of the physicians had never (32%) or only sometimes (42%) referred a patient to a health-related Internet site. Most physicians (53%) found it difficult to stay up-to-date with reliable Internet sites for patients. Physicians are moderately positive about their patients' health-related Internet use but only seldom refer them to relevant sites. Offering an up-to-date site with accredited websites for patients might help physicians refer their patients.

Varma, V., S. Varma, et al. (2009). "Structured data system for a breast cancer medical record." Studies in Health Technology & Informatics 143: 354-357.

We have developed software for an Electronic Medical Record (EMR) to be used by oncologists and researchers. It has rapid, structured data entry, visualization of clinical information and a searchable data base. Interactive, rules-based forms were designed for structured data entry. The web-based forms have been customized for the clinical staff who enter the data. The forms have been tested by oncologists and their office assistants. Modules have been added to upload images and add legends, metadata, and code classifications such as ICD and CPT. Other features include a search interface and a permission system that controls user access. Oncologists enter detailed information during a patient's visit to the clinic. The electronic forms capture diagnoses, stage and history,

which includes social, family, and medical history. A time map provides a graphical summary of a patient's record. Visualization of complex clinical information with intuitive navigation increases clarity while retaining the detail necessary for clinical information. Customized data entry forms and automatic coding speed the workflow. The system can potentially interface with multi-institutional data-sharing systems such as Cancer Bioinformatics Grid (CaBig).

Visser, A. and M. Wysmans (2010). "Improving patient education by an in-service communication training for health care providers at a cancer ward: communication climate, patient satisfaction and the need of lasting implementation." Patient Education & Counseling 78(3): 402-408.

OBJECTIVE: To show the effects of an in-service communication training for health care providers at a cancer ward, to improve the quality and quantity of the patient education, and patient satisfaction with the care received. METHODS: A 3-year in-service communication training was held at a cancer ward. Pre- and post-data were collected about the quality and quantity of the communication of nurses, physicians and other health care providers (HCPs) towards patients and colleagues (n=22) as well as the satisfaction of the patients with the quality of care (n=90). RESULTS: The communication training raised significantly the quality and quantity of the communication towards patients and with colleagues. Also patient satisfaction with the quality of care increased. However, the long-term implementation of the benefits was proved disappointing. CONCLUSION: In-service communication training is an important means for the long-term improvement of the quality of patient education at nursing departments in hospitals. Lasting implementation of the benefits however requires attention to organizational obstacles, budgetary conditions, leadership factors at the ward, and the application of an organizationally oriented theoretical framework. PRACTICE IMPLICATIONS: Improvement of patient education at nursing wards does not only require educational means, organizational facilities and professional training, but can be improved too by in-service communication training, which increases the quality of the patient-centered care. An organizational oriented change-strategy is needed to ensure the implementation produces lasting effects. Copyright 2010 Elsevier Ireland Ltd. All rights reserved.

Vitezic, D., M. Lovrek, et al. (2009). "Centralized national ethical review of clinical trials in Croatia." Croatian Medical Journal 50(2): 111-116.

AIM: To present the Croatian system of ethical review of clinical trials and assessment outcomes of the applications reviewed by the Croatian Central Ethics Committee. METHODS: Clinical trial applications reviewed by the Croatian Central Ethics Committee, which has the legal mandate to review clinical trials of medicinal products and medical devices, were retrospectively analyzed from May 2004 to the end of 2008 according to the number, research area, and type of opinion issued. Applications from 2008 were analyzed separately according to the study phase, participants (adult trials vs pediatric trials), and sponsor (commercial trials vs academic trials). Data were analyzed by descriptive statistics. RESULTS: Since its establishment in 2004, the Croatian Central Ethics

Committee has reviewed 407 trials. The greatest number of clinical trials was in the field of oncology (n = 69), mental and behavioral disorders (n = 52), and endocrine, nutritional, and metabolic diseases (n = 50). In the initial assessment of clinical trials, 60% applications received a conditionally positive opinion. In 28% of applications, the opinion had to be postponed because additional documentation or explanations were required. In 2008, the Croatian Central Ethics Committee reviewed 99 trials, most of which were phase III trials (n = 57). Five clinical trials included pediatric population and 3 were academic clinical trials. CONCLUSION: The model of centralized clinical trial review seems to be appropriate for the current number of clinical trials conducted in Croatia. The efficient and standardized review process of clinical trials by the Central Ethics Committee may positively affect the increasing number of clinical trials conducted in Croatia. Future development includes the transparency of the clinical trials through a publically available database and establishing the basis for conducting academic clinical trials.

Vogelbaum, M. A., A. L. Asher, et al. (2009). "Modern treatment of cerebral metastases: Integrated Medical Learning(SM) at CNS 2007." Journal of Neuro-Oncology 93(1): 89-105.

INTRODUCTION: Cerebral metastases are a common problem and pose complex treatment decisions, with reference to local control of treated lesions, prevention of new brain metastases, and toxicity of available treatments. At the 2007 Congress of Neurological Surgeons (CNS) Annual Meeting, a novel active learning process, called Integrated Medical Learning(SM), was used to better understand contemporary practice patterns and to monitor the success of education about these critical treatment decisions. METHODS: CNS members received an electronically distributed premeeting survey and educational materials about single and multiple cerebral metastasis treatment; practice patterns were elicited. At the Annual Meeting, 496 surgeons were polled using handheld devices before and after surgical and radiation oncology expert presentations. Surgeons who had answered premeeting surveys received a second, postmeeting questionnaire. RESULTS: In the premeeting questionnaire (N = 214), higher current volume of practice, Tumor Section membership, and academic practice predicted more correct answers ($P < 0.05$ for all). Fifty five percent favored routine whole brain radiotherapy (WBRT) after metastasis resection. Thirty four percent "most often" used radiosurgery to the resection bed; these respondents cited "cognitive changes" in justifying WBRT omission. At the meeting, expert presentations were followed by audience shifts toward adjuvant WBRT after resection ($P = 0.01$) or radiosurgery ($P < 0.001$)-topics for which class I evidence was discussed. There was no shift in preference for surgery or radiosurgery ($P = 0.24$) or multiple metastasis treatment ($P = 0.8$)-topics for which clear class I evidence was not presented. Postmeeting questionnaires showed retained knowledge among meeting attendees. CONCLUSIONS: Using IML, we were able to study baseline knowledge and practice patterns for an important neuro-oncological treatment decision. Evidence suggested expert presentations were effective in changing audience opinion

when relevant class I evidence was presented, and that knowledge was retained postmeeting.

Vordermark, D. (2010). "Patient information and decision AIDS in oncology: need for communication between patients and physicians." Journal of Clinical Oncology 28(29): e567; author reply e568.

Wagenblast, J., O. Adunka, et al. (2010). "AdOnco database - six years' experience with the documentation of clinical and scientific data on patients with head and neck cancer." In Vivo 24(4): 603-606.

PURPOSE: To report the experience with AdOnco, a computerized database for head and neck cancer patients. PATIENTS AND METHODS: AdOnco is a Filemaker Pro 6.0 based database integrated into the local network of the host ENT department. It is used by the physicians as a clinical and scientific documentation system to store and retrieve information about all patients with head and neck cancer referred to the host oncology center. This study reviews the achievements to date of AdOnco and, as an example of its enormous data evaluation potential, presents survival curves of patients with laryngeal cancer undergoing laser resection. RESULTS: Over a period of six years, the data of 881 patients with head and neck cancer were entered into the AdOnco database. CONCLUSION: AdOnco has proven to be a useful patient database and documentation system which has become an integral and essential part of daily clinical routine and also a valuable research tool.

Wang-Gillam, A., J. Valentine, et al. (2008). "Experiences of Institutional Review Board (IRB) and Protocol Review and Monitoring Committee (PRMC) rotations in hematology/oncology training." Journal of Cancer Education 23(2): 71-73.

BACKGROUND: Trainees in hematology oncology need to learn development and regulation of clinical research protocols. METHODS: We hypothesized that rotation on the Institutional Review Board (IRB) and Protocol Review and Monitor Committee (PRMC) at our university could improve fellows' understanding of clinical trial development and regulation. RESULTS: Since 1999, 20 fellows in our training program have rotated through either IRB or PRMC for 3 months. We evaluated their experiences by anonymous questionnaire with 13 quantitative, 1 yes-or-no, and 4 open-ended questions and correlated responses to their demographic characteristics. CONCLUSIONS: We report here these fellow's experiences in attending these meetings. We also describe other benefits of IRB/PRMC participation in training fellows, and finally propose to other fellowship programs to consider this educational approach as a way of enhancing hematology/oncology training.

Ward, A. M., M. Agar, et al. (2009). "Collaborating or co-existing: a survey of attitudes of medical oncologists toward specialist palliative care." Palliative Medicine 23(8): 698-707.

Patients with advanced cancer often have complex care needs requiring collaboration between medical oncology and palliative care providers. Little is

known about how effective and acceptable such collaboration is to medical oncologists. Attitudes of Australian medical oncologists toward collaboration with specialist palliative care services were investigated using a Web-based survey. Descriptive statistics and attitude indices were calculated and a thematic content analysis performed. One hundred and fifteen respondents (78 medical oncologists, 37 trainees) completed the survey (response rate 30.3%). Positive attitudes toward specialist palliative care involvement were expressed with most respondents preferring concurrent rather than sequential models of care (94.8%, n = 109). Reported barriers to collaboration included reluctance for referral by patients (minor 60.9%, n = 70; major 8.7%, n = 10) or families (minor 67%, n = 77; major 7%, n = 8), a lack of inpatient beds (minor 27%, n = 31; major 34.8%, n = 40) and inadequate resources for specialist palliative care to take some referrals (minor 30.4%, n = 35; major 30.4%, n = 35). There was no difference in attitude indices for those who had completed a palliative care rotation during their training (33%, n = 38) and those who had not. Suggestions for improvement in collaboration focused around four areas - improved resources, improved multidisciplinary links, mutual respect and understanding, and consistency in service provision. This study is the first to specifically investigate the views of Australian medical oncologists toward collaboration with specialist palliative care. While positive attitudes have been expressed, identified barriers to collaboration need attention.

Whittaker, A. A., M. Aufdenkamp, et al. (2009). "Barriers and facilitators to electronic documentation in a rural hospital." Journal of Nursing Scholarship 41(3): 293-300.

PURPOSE: The purpose of the study was to explore nurses' perceptions of barriers and facilitators to adoption of an electronic health record (EHR) in a rural Midwestern hospital. DESIGN: This study was a qualitative, descriptive design. The Staggers and Parks Nurse-Computer Interaction Framework was used to guide directed content analysis. METHODS: Eleven registered nurses from oncology and medical-surgical units were interviewed using three semistructured interview questions. Predetermined codes and operational definitions were developed from the Staggers and Parks framework. Narrative data were analyzed by each member of the research team and group consensus on coding was reached through group discussions. FINDINGS: Participants were able to identify computer-related, nurse-related, and contextual barriers and facilitators to implementation of EHR. In addition, two distinct patterns of perceptions and acceptance were identified. CONCLUSIONS: The Staggers and Parks Nurse-Computer Interaction framework was found to be useful in identifying computer, nurse, and contextual characteristics that act as facilitators or barriers to adoption of an EHR system. Acceptance and use of an EHR are enhanced when barriers are managed and facilitators are supported. CLINICAL RELEVANCE: Understanding and management of facilitators and barriers to EHR adoption may impact nurses' ability to provide and document nursing care.

Wingard, J. R. (2008). "Influenza: preparedness for an inevitable "Emergency" for oncology and BMT units." Journal of the National Comprehensive Cancer Network 6(2):

215-222.

Influenza is a seasonal and pandemic threat to the general population. The effects can be devastating for cancer patients and those who have undergone blood and marrow transplantation (BMT). However, this impact can be minimized. Emergency preparedness is the key to mitigating the impact on the oncology and BMT services. Having a plan that provides a framework of preparedness and outlines steps to take in the event of a community outbreak is crucial. A vigorous immunization campaign for patients, household contacts, and health care staff early in the season is the single most important action. In the midst of an outbreak, the oncology and BMT teams should act to quickly identify patients with suspected infections, move infected patients and staff away from noninfected patients to prevent contact, and decide which patients require prevention or treatment with antiviral agents. Ongoing engagement by the entire team to evaluate the effectiveness of its actions and modify its plan as necessary will ensure success. [References: 59]

Wise, M., L. Marchand, et al. (2009). "Integrating a narrative medicine telephone interview with online life review education for cancer patients: lessons learned and future directions." Journal Of The Society For Integrative Oncology 7(1): 19-25.

We describe an online narrative and life review education program for cancer patients and the results of a small implementation test to inform future directions for further program development and full-scale evaluation research. The intervention combined three types of psycho-oncology narrative interventions that have been shown to help patients address emotional and existential issues: (1) a physician-led dignity-enhancing telephone interview to elicit the life narrative, (2) delivery of an edited life manuscript, and (3) self-directed life review education delivered via a Web site with instructional materials and expert consultation to help people revise and share their story. Eleven cancer patients tested the intervention and provided feedback in an in-depth exit interview. Although everyone said telling and receiving the edited story manuscript was helpful and meaningful, only people with high death salience and previous computer experience used the Web tools to enhance and share their story. Computer users prodded us to provide more sophisticated tools, and older (> 70 years) users needed more staff and family support. We conclude that combining a telephone expert-led interview with online life review education can extend access to integrative oncology services, is most feasible for computer-savvy patients with advanced cancer, and must use platforms that allow patients to upload files and invite their social network.

Wood, B. J., J. Kruecker, et al. (2010). "Navigation systems for ablation." Journal of Vascular & Interventional Radiology 21(8 Suppl): S257-263.

Navigation systems, devices, and intraprocedural software are changing the way interventional oncology is practiced. Before the development of precision navigation tools integrated with imaging systems, thermal ablation of hard-to-image lesions was highly dependent on operator experience, spatial skills, and estimation of positron emission tomography-avid or arterial-phase targets.

Numerous navigation systems for ablation bring the opportunity for standardization and accuracy that extends the operator's ability to use imaging feedback during procedures. In this report, existing systems and techniques are reviewed and specific clinical applications for ablation are discussed to better define how these novel technologies address specific clinical needs and fit into clinical practice. Copyright (c) 2010 SIR. Published by Elsevier Inc. All rights reserved.

Wu, Y., S. Aravind, et al. (2009). "Anemia and thrombocytopenia in patients undergoing chemotherapy for solid tumors: a descriptive study of a large outpatient oncology practice database, 2000-2007." Clinical Therapeutics 31 Pt 2: 2416-2432.

OBJECTIVE: This study was conducted to evaluate data on chemotherapy-associated anemia and thrombocytopenia, and cycle delays in patients with cancer in a community oncology practice. METHODS: Data on adult patients (age > or =18 years) with cancer treated in outpatient oncology clinics throughout the United States between 2000 and 2007 were obtained from a large electronic medical records database. All types of cancer were included, although the focus was on solid cancers (ie, lung, breast, ovarian, head and neck, and colorectal cancers). Chemotherapy regimens were grouped from most to least toxic as follows: platinum-based, anthracycline-based, gemcitabine-based, taxane-based, and all other regimens. Anemia (defined as hemoglobin <11 g/dL), thrombocytopenia (defined as platelet count <150 x 10(9)/L), red blood cell (RBC) and platelet transfusions, and use of erythropoietin-stimulating agents (ESAs) were examined by tumor and regimen type. Cycle delays (>7 days) during chemotherapy were also evaluated. RESULTS: A total of 47,159 patients were included in the study (58.4% female; mean [SD] age, 60.76 [13.9] years). The most common cancer was breast cancer (19.5%), followed by non-small cell lung cancer (14.9%), colorectal cancer (11.9%), ovarian cancer (3.1%), and head and neck cancer (2.5%). At baseline, 20.9% of patients had anemia and 11.1% had thrombocytopenia. A total of 75,243 chemotherapy regimens were administered. During the course of chemotherapy, from 46.4% to 59.0% of patients developed anemia. The prevalence of thrombocytopenia ranged from 21.9% in patients treated with taxane-based regimens to 64.2% in patients treated with gemcitabine-based regimens. In patients from a single hospital-based outpatient center that had the most complete transfusion data (representing 18.3% of the population), the use of RBC transfusion ranged from 4.5% in patients treated with anthracycline-based regimens to 11.6% in patients treated with platinum-based regimens. ESAs were received at some point during chemotherapy by 49.1% of patients. For those with complete dose information, dose delay occurred in 8.2% of chemotherapy cycles; the mean delay was 17 days. CONCLUSION: In this study of anemia and thrombocytopenia in a large cohort of patients undergoing chemotherapy for solid tumors in an outpatient oncology clinic in 2000-2007, the burden of anemia and thrombocytopenia remained high. Copyright 2009 Excerpta Medica Inc. All rights reserved.

Yamamoto, K., S. Matsumoto, et al. (2008). "A data capture system for outcomes

studies that integrates with electronic health records: development and potential uses." Journal of Medical Systems 32(5): 423-427.

In conventional clinical studies, the costs of data management for quality control tend to be high and collecting paper-based case report forms (CRFs) tends to be burdensome, because paper-based CRFs must be developed and filled out for each clinical study protocol. Use of electronic health records for this purpose could result in reductions in cost and improvements in data quality in clinical studies. The purpose of this study was to develop a data capture system for observational cancer clinical studies (i.e. outcomes studies) that would integrate with an electronic health records system, to enable evaluation of patient prognosis, prognostic factors, outcomes and drug safety. At the Outpatient Oncology Unit of Kyoto University Hospital, we developed a data capture system that includes a cancer clinical database system and a data warehouse for outcomes studies. We expect that our new system will reduce the costs of data management and analysis and improve the quality of data in clinical studies.

Yang, C. Y., J. C. Tsai, et al. (2011). "Effects of a home-based walking program on perceived symptom and mood status in postoperative breast cancer women receiving adjuvant chemotherapy." Journal of Advanced Nursing 67(1): 158-168.

AIM: This paper is a report of a study analysing the effect of a home-based walking exercise program on symptoms and mood distress among breast cancer women receiving chemotherapy postoperatively. BACKGROUND: Treatment-related symptoms, mood distress and decline in physical activity have been identified as major complaints among cancer patients. Studies on the efficacy of home-based walking exercise for symptoms and mood did not fully describe the exercise prescriptions that could be safe and beneficial for women with breast cancer, especially these receiving adjuvant chemotherapy. METHOD: This is a prospective, randomized clinical trial. In 2008-2009, participants were recruited from the oncology outpatient clinic of a medical center in Taiwan, and were assigned to either the exercise group (n=19) or the control group (n=21). Women in the exercise group participated in a moderate-intensity home-based walking program for 12weeks during their chemotherapy treatments. Symptoms, mood status and physical activity level were measured at baseline, 6- and 12-week follow-up. Data were analysed by two-way repeated-measures analysis of variance. RESULTS: Women in the exercise group reported significantly lower symptom severity scores and mood disturbance compared with those in the control group throughout the study period. CONCLUSION: Regular moderate-intensity exercise can play an important role in improving treatment-related symptoms and mood in women with breast cancer. A home-based walking exercise program can be easily incorporated into care for women with breast cancer undergoing chemotherapy. Copyright 2010 Blackwell Publishing Ltd.

Yap, K. Y., A. Chan, et al. (2009). "Improving pharmaceutical care in oncology by pharmacoinformatics: the evolving role of informatics and the internet for drug therapy." Lancet Oncology 10(10): 1011-1019.

Health-care has rapidly evolved with the informatics revolution. The rapid growth

of the world-wide web as a tool for global connectivity has affected the way in which health-related information is distributed and accessed over the internet. Many informatics and internet applications are now available for use by both oncology health-care professionals and patients with cancer, with many people using the internet to search for drug-related and other health-related information. The practice of pharmaceutical care aims to ensure optimum medication-related therapeutic outcomes in patients, and involves identifying, solving, and preventing potential or actual drug-related problems (DRPs) with regards to a patient's drug therapy. Pharmacoinformatics involves the use of informatics, the internet, and interactive technologies to solve DRPs, with a focus on providing optimum pharmaceutical care and improved patient safety. This paper highlights the different pharmacoinformatics channels that have been used in the provision of pharmaceutical care, which are relevant to both oncology health-care professionals and patients with cancer. We will discuss several issues that have arisen as a result of cybermedicine, which can potentially affect the quality of pharmaceutical care in patients with cancer, and also provide insights into how pharmacoinformatics can potentially affect the future of healthcare. The opportunity of integrating pharmacoinformatics in the practice of clinical oncology as an aid to solve DRPs is indeed appealing. Oncology practitioners should not only focus on the acquistion of new treatment strategies, but also continue to embrace and harness new information and communication technologies, so as to increase their efficiency and improve on the pharmaceutical care of patients with cancer. [References: 100]

Yap, K. Y., Y. X. Ho, et al. (2010). "Harnessing the internet cloud for managing drug interactions with chemotherapy regimens in patients with cancer suffering from depression." Acta Oncologica 49(8): 1235-1245.

UNLABELLED: Concomitant use of anticancer drugs (ACDs) and antidepressants (ADs) in the treatment of depression in patients with cancer may result in potentially harmful drug-drug interactions (DDIs). It is crucial that clinicians make timely, accurate, safe and effective decisions regarding drug therapies in patients. The ubiquitous nature of the internet or "cloud" has enabled easy dissemination of DDI information, but there is currently no database dedicated to allow searching of ACD interactions by chemotherapy regimens. We describe the implementation of an AD interaction module to a previously published oncology-specific DDI database for clinicians which focuses on ACDs, single-agent and multiple-agent chemotherapy regimens. METHODS: Drug- and DDI-related information were collated from drug information handbooks, databases, package inserts, and published literature from PubMed, Scopus and Science Direct. Web documents were constructed using Adobe software and programming scripts, and mounted on a domain served from the internet cloud. RESULTS: OncoRx is an oncology-specific DDI database whose structure is designed around all the major classes of ACDs and their frequently prescribed chemotherapy regimens. There are 117 ACDs and 256 regimens in OncoRx, and it can detect over 1 500 interactions with 21 ADs. Clinicians are provided with the pharmacokinetic parameters of the drugs, information on the regimens and

details of the detected DDIs during an interaction search. CONCLUSION: OncoRx is the first database of its kind which allows detection of ACD and chemotherapy regimen interactions with ADs. This tool will assist clinicians in improving clinical response and reducing adverse effects based on the therapeutic and toxicity profiles of the drugs.

Yap, K. Y., E. Y. Kuo, et al. (2010). "An onco-informatics database for anticancer drug interactions with complementary and alternative medicines used in cancer treatment and supportive care: an overview of the OncoRx project." Supportive Care in Cancer 18(7): 883-891.

PURPOSE: Cancer patients are at high risk of manifesting interactions from use of anticancer drugs (ACDs) and complementary and alternative medicines (CAMs). These interactions can result in sub-therapeutic effects or increased toxicities which may compromise the outcome of chemotherapy. It is important for practitioners to gain convenient access to ACD-CAM interaction information so as to make better-informed decisions in daily practice. This paper describes the creation of an oncology database (OncoRx) that documents ACD-CAM interactions, including traditional Chinese medicines (TCMs) that are commonly used for cancer treatment, prevention, and supportive care therapy. METHODS: Information regarding ACDs, CAMs, and drug interactions were collated from 14 sources, inclusive of hardcopy and online resources, and input into a modified web server with a database engine and a programming interface using a combination of software and programming scripts. RESULTS: OncoRx currently contains a total of 117 ACDs and 166 CAMs. Users are able to search for interactions based on various CAM uses: cancer treatment or prevention, immune-system-related, alopecia, nausea, and vomiting, peripheral neuropathy and pain, inflammation, fatigue, and non-cancer related. Pharmacokinetic data on ACDs and CAMs, characteristics of CAMs based on TCM principles, and drug interaction parameters such as effects, mechanisms, evidences, and proposed management plans, are shown in the search results. CONCLUSION: OncoRx is an oncology database which detects ACD interactions. It is currently able to detect interactions with CAMs. It is hoped that OncoRx will serve as a useful resource to clinicians, educators, trainers, and students working in the oncology setting.

Yu, C. X., C. J. Amies, et al. (2008). "Planning and delivery of intensity-modulated radiation therapy." Medical Physics 35(12): 5233-5241.

Intensity modulated radiation therapy (IMRT) is an advanced form of external beam radiation therapy. IMRT offers an additional dimension of freedom as compared with field shaping in three-dimensional conformal radiation therapy because the radiation intensities within a radiation field can be varied according to the preferences of locations within a given beam direction from which the radiation is directed to the tumor. This added freedom allows the treatment planning system to better shape the radiation doses to conform to the target volume while sparing surrounding normal structures. The resulting dosimetric advantage has shown to translate into clinical advantages of improving local and

regional tumor control. It also offers a valuable mechanism for dose escalation to tumors while simultaneously reducing radiation toxicities to the surrounding normal tissue and sensitive structures. In less than a decade, IMRT has become common practice in radiation oncology. Looking forward, the authors wonder if IMRT has matured to such a point that the room for further improvement has diminished and so it is pertinent to ask what the future will hold for IMRT. This article attempts to look from the perspective of the current state of the technology to predict the immediate trends and the future directions. This article will (1) review the clinical experience of IMRT; (2) review what we learned in IMRT planning; (3) review different treatment delivery techniques; and finally, (4) predict the areas of advancements in the years to come. [References: 112]

Yu, P., S. Gandhidasan, et al. (2010). "Different usage of the same oncology information system in two hospitals in Sydney--lessons go beyond the initial introduction." International Journal of Medical Informatics 79(6): 422-429.

BACKGROUND AND PURPOSE: The experience of clinicians at two public hospitals in Sydney, Australia, with the introduction and use of an oncology information system (OIS) was examined to extract lessons to guide the introduction of clinical information systems in public hospitals. METHODS AND MATERIALS: Semi-structured interviews were conducted with 12 of 15 radiation oncologists employed at the two hospitals. The personnel involved in the decision making process for the introduction of the system were contacted and their decision making process revisited. The transcribed data were analyzed using NVIVO software. Themes emerged included implementation strategies and practices, the radiation oncologists' current use and satisfaction with the OIS, project management and the impact of the OIS on clinical practice. RESULTS: The hospitals had contrasting experiences in their introduction and use of the OIS. Hospital A used the OIS in all aspects of clinical documentation. Its implementation was associated with strong advocacy by the Head of Department, input by a designated project manager, and use and development of the system by all staff, with timely training and support. With no vision of developing a paperless information system, Hospital B used the OIS only for booking and patient tracking. A departmental policy that data entry for the OIS was centrally undertaken by administrative staff distanced clinicians from the system. All the clinicians considered that the OIS should continuously evolve to meet changing clinical needs and departmental quality improvement initiatives. CONCLUSIONS: This case study indicates that critical factors for the successful introduction of clinical information systems into hospital environment were an initial clear vision to be paperless, strong clinical leadership and management at the departmental level, committed project management, and involvement of all staff, with appropriate training. Clinician engagement is essential for post-adoption evolution of clinical information systems. Copyright 2010 Elsevier Ireland Ltd. All rights reserved.

Zacarias, A. S. and M. D. Mills (2010). "Management of an affiliated Physics Residency Program using a commercial software tool." Journal of Applied Clinical Medical Physics

11(3): 2996.

A review of commercially available allied health educational management software tools was performed to evaluate their capacity to manage program data associated with a CAMPEP-accredited Therapy Physics Residency Program. Features of these software tools include: a) didactic course reporting and organization, b) competency reporting by topic, category and didactic course, c) student time management and accounting, and d) student patient case reporting by topic, category and course. The software package includes features for recording school administrative information; setting up lists of courses, faculty, clinical sites, categories, competencies, and time logs; and the inclusion of standardized external documents. There are provisions for developing evaluation and survey instruments. The mentors and program may be evaluated by residents, and residents may be evaluated by faculty members using this feature. Competency documentation includes the time spent on the problem or with the patient, time spent with the mentor, date of the competency, and approval by the mentor and program director. Course documentation includes course and lecture title, lecturer, topic information, date of lecture and approval by the Program Director. These software tools have the facility to include multiple clinical sites, with local subadministrators having the ability to approve competencies and attendance at clinical conferences. In total, these software tools have the capability of managing all components of a CAMPEP-accredited residency program. The application database lends the software to the support of multiple affiliated clinical sites within a single residency program. Such tools are a critical and necessary component if the medical physics profession is to meet the projected needs for qualified medical physicists in future years.

Zernikow, B., C. Hasan, et al. (2008). "Stop the pain! A nation-wide quality improvement programme in paediatric oncology pain control." European Journal of Pain: Ejp 12(7): 819-833.

INTRODUCTION: Little is known about the impact of translation of pain management clinical practice guidelines on pain control in paediatrics. In an effort to overcome this, a longitudinal, nation-wide, multi-centre paediatric quality improvement (QI) study was initiated by the German Society of Pediatric Haematology and Oncology (GPOH) entitled Schmerz-Therapie in der Onkologischen Paediatrie (STOP). OBJECTIVE: The project's primary major aims were to improve paediatric oncology pain control in Germany, and to evaluate the project's impact on the pain management quality. To achieve these aims, STOP encompassed six sequential phases to evaluate present practice, develop recommendations for practical pain control, actively engage participants in improvement strategies, and assess change. The purpose of this paper is to briefly describe STOP in its entirety, report on comparisons between active quality management (QM) departments that actively participated in the project and non-active QM departments regarding differences in pain control, patients' and parents' perspectives on pain control and health professionals' knowledge, and to discuss the impact of STOP as a whole. METHODS: Four hypotheses were examined: (1) changes in health care professionals' knowledge on pain in

paediatric oncology and pain management after a three-year period (2) impact of active participation in the STOP-project; (3) differences in patients' and parents' perspective in active QM versus non-active QM departments; (4) impact of the STOP-project on the health care professionals' knowledge in active QM versus non-active QM departments. Data included surveys, interviews, and standardised pre-/post-intervention documentation of pain control. All German paediatric oncology departments were invited to participate. The prime means of intervention was education (printed material, passive participation; additional lectures and feed-back, active participation). Quality indicators were defined and compared with regards to the four hypotheses. RESULTS: Sixty-eight departments participated passively. Eight departments participated actively, enrolling 224 patients (median age, 9 years) and documenting a total of 2265 treatment days. In the areas addressed, all health professionals demonstrated increases in knowledge on pain and pain control after a three-year period. STOP objectively improved pain control in the actively participating departments. Painful modes of drug administration were used less frequently; the usage of mixed opioid agonists-antagonists was reduced; the physicians' knowledge of the treatment of neuropathic pain increased; pain ratings significantly decreased, and less episodes of strong pain were observed. There was a significant increase in the proportion of health-care professionals who post-interventionally judged that pain therapy had been initiated earlier and at exactly the right time. Neither patients nor parents felt, however, that there was any quality improvement. According to participants' self-assessment, STOP improved practical pain management in actively participating departments, while in passively participating departments the change to the better was negligible. CONCLUSION: STOP predominantly aimed at and succeeded in the improvement of structure, process and outcome quality. With regard to patients' and parents' opinions, the interview tools might have been unsuited to measure the quality of pain control, or STOP was insufficient to improve pain control to a magnitude significant to the patient.

Zhao, B., M. C. Joiner, et al. (2010). ""SABER": A new software tool for radiotherapy treatment plan evaluation." Medical Physics 37(11): 5586-5592.

PURPOSE: Both spatial and biological information are necessary in order to perform true optimization of a treatment plan and for predicting clinical outcome. The goal of this work is to develop an enhanced treatment plan evaluation tool which incorporates biological parameters and retains spatial dose information. METHODS: A software system is developed which provides biological plan evaluation with a novel combination of features. It incorporates hyper-radiosensitivity using the induced-repair model and applies the new concept of dose convolution filter (DCF) to simulate dose wash-out effects due to cell migration, bystander effect, and/or tissue motion during treatment. Further, the concept of spatial DVH (sDVH) is introduced to evaluate and potentially optimize the spatial dose distribution in the target volume. Finally, generalized equivalent uniform dose is derived from both the physical dose distribution (gEUD) and the distribution of equivalent dose in 2 Gy fractions (gEUD2) and the software provides three separate models for calculation of tumor control probability (TCP),

normal tissue complication probability (NTCP), and probability of uncomplicated tumor control (P+). TCP, NTCP, and P+ are provided as a function of prescribed dose and multivariable TCP, NTCP, and P+ plots are provided to illustrate the dependence on individual parameters used to calculate these quantities. Ten plans from two clinical treatment sites are selected to test the three calculation models provided by this software. RESULTS: By retaining both spatial and biological information about the dose distribution, the software is able to distinguish features of radiotherapy treatment plans not discernible using commercial systems. Plans that have similar DVHs may have different spatial and biological characteristics and the application of novel tools such as sDVH and DCF within the software may substantially change the apparent plan quality or predicted plan metrics such as TCP and NTCP. For the cases examined, both the calculation method and the application of DCF can change the ranking order of competing plans. The voxel-by-voxel TCP model makes it feasible to incorporate spatial variations of clonogen densities (n), radiosensitivities (SF2), and fractionation sensitivities (alpha/beta) as those data become available. CONCLUSIONS: The new software incorporates both spatial and biological information into the treatment planning process. The application of multiple methods for the incorporation of biological and spatial information has demonstrated that the order of application of biological models can change the order of plan ranking. Thus, the results of plan evaluation and optimization are dependent not only on the models used but also on the order in which they are applied. This software can help the planner choose more biologically optimal treatment plans and potentially predict treatment outcome more accurately.

Ziegenhein, P., J. J. Wilkens, et al. (2008). "Speed optimized influence matrix processing in inverse treatment planning tools." Physics in Medicine & Biology 53(9): N157-164.

An optimal plan in modern treatment planning tools is found through the use of an iterative optimization algorithm, which deals with a high amount of patient-related data and number of treatment parameters to be optimized. Thus, calculating a good plan is a very time-consuming process which limits the application for patients in clinics and for research activities aiming for more accuracy. A common technique to handle the vast amount of radiation dose data is the concept of the influence matrix (DIJ), which stores the dose contribution of each bixel to the patient in the main memory of the computer. This study revealed that a bottleneck for the optimization time arises from the data transfer of the dose data between the memory and the CPU. In this note, we introduce a new method which speeds up the data transportation from stored dose data to the CPU. As an example we used the DIJ approach as is implemented in our treatment planning tool KonRad, developed at the German Cancer Research Center (DKFZ) in Heidelberg. A data cycle reordering method is proposed to take the advantage of modern memory hardware. This induces a minimal eviction policy which results in a memory behaviour exhibiting a 2.6 times faster algorithm compared to the naive implementation. Although our method is described for the DIJ approach implemented in KonRad, we believe that any other planning tool

which uses a similar approach to store the dose data will also benefit from the described methods.