AIHI | AUSTRALIAN INSTITUTE OF HEALTH INNOVATION

MACQUARIE University

Welcome

Australian Institute of Health Innovation Research Symposium 2015 Macquarie University

Tuesday 31 March 2015

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MACQUARIE University

AIHI Research Symposium 2015

Macquarie University

Professor Jeffrey Braithwaite, PhD
Professor and Founding Director,
Australian Institute of Health Innovation

MACQUARIE University

Mission

Our mission is **to enhance local, institutional and international health system decision-making through evidence**; and **use systems sciences and translational approaches to provide innovative, evidence-based solutions** to specified health care delivery problems.

www.aihi.mq.edu.au

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Leadership

Professor Jeffrey Braithwaite

Foundation Director, AIHI; Director, Centre for Healthcare Resilience and Implementation Science (CHRIS)

Professor Enrico Coiera

Director, Centre for Health Informatics (CHI)

Professor Johanna Westbrook

Director, Centre for Health Systems and Safety Research (CHSSR)

PhD Completions

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Higher Degree Candidates

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Health Care by the numbers

Health Expenditure $140.2 billion (9.5% GDP)

9.3 million hospitalisations

1,167,633 in health care and social assistance

1,050 hospitals

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[AIHW, 2014]

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The Centre for Health Informatics

@enricocoiera

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Next-generation decision making

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- **New decision-makers**: e.g. the rise of the consumers
- **New decision classes**: behavior change, dashboards/process control
- **New data sources**: EHR, wearables/AR, SoMe, ‘omics’, literature.
- **Personalised decisions:** patients like me/mine
- **Population-based**: surveillance of opinions, COIs …
- **Safer decision-making**: IT should “Do no harm”

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Health Analytics Lab

Dr Blanca Gallego Luxan

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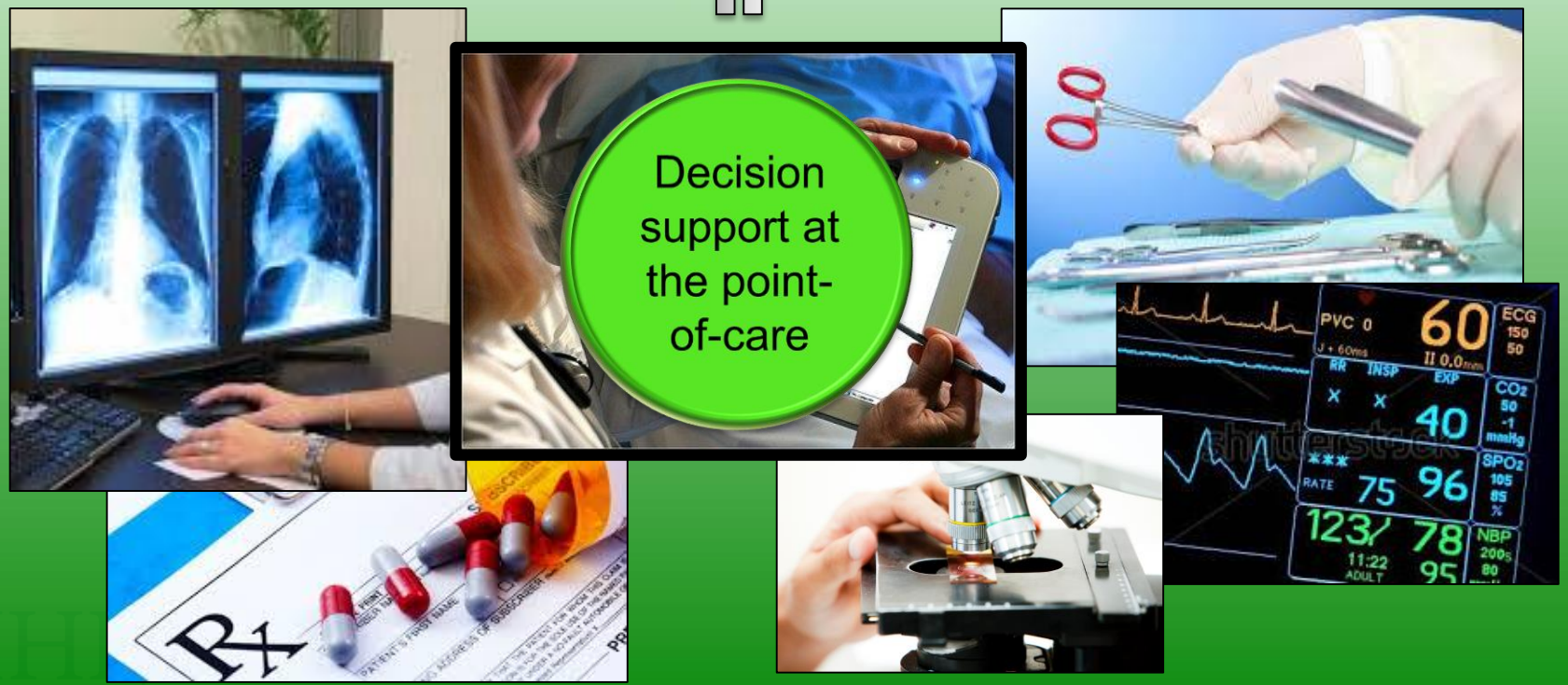
Continuously updated + Real-time + "Virtual" cohort matching + Innovative technologies =



Computable Evidence Lab

Dr Guy Tsafnat

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BMJ 2013;346:f139 doi: 10.1136/bmj.f139 (Published 10 January 2013)

EDITORIALS

The automation of systematic reviews

Would lead to best currently available evidence at the push of a button

Guy Tsafnat *senior research fellow*[1], Adam Dunn *research fellow*[1], Paul Glasziou *professor*[2], Enrico Coiera *professor*[1]

[1]Centre for Health Informatics, Australian Institute of Health Innovation, University of New South Wales, Sydney, NSW 2052, Australia ; [2]Centre for Research on Evidence Based Practice, Bond University, Gold Coast, Australia

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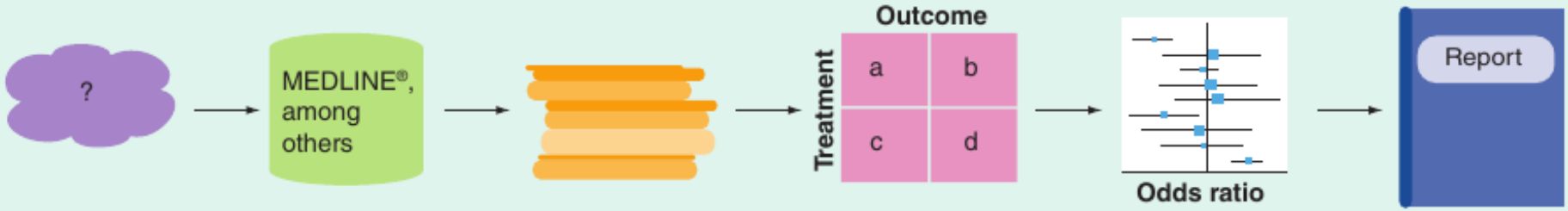


Prepare topic
- Refine key questions
- Develop analytic frameworks

Search for studies
- Identify eligibility criteria
- Search for relevant studies

Screen studies
- Select evidence for inclusion based on eligibility criteria

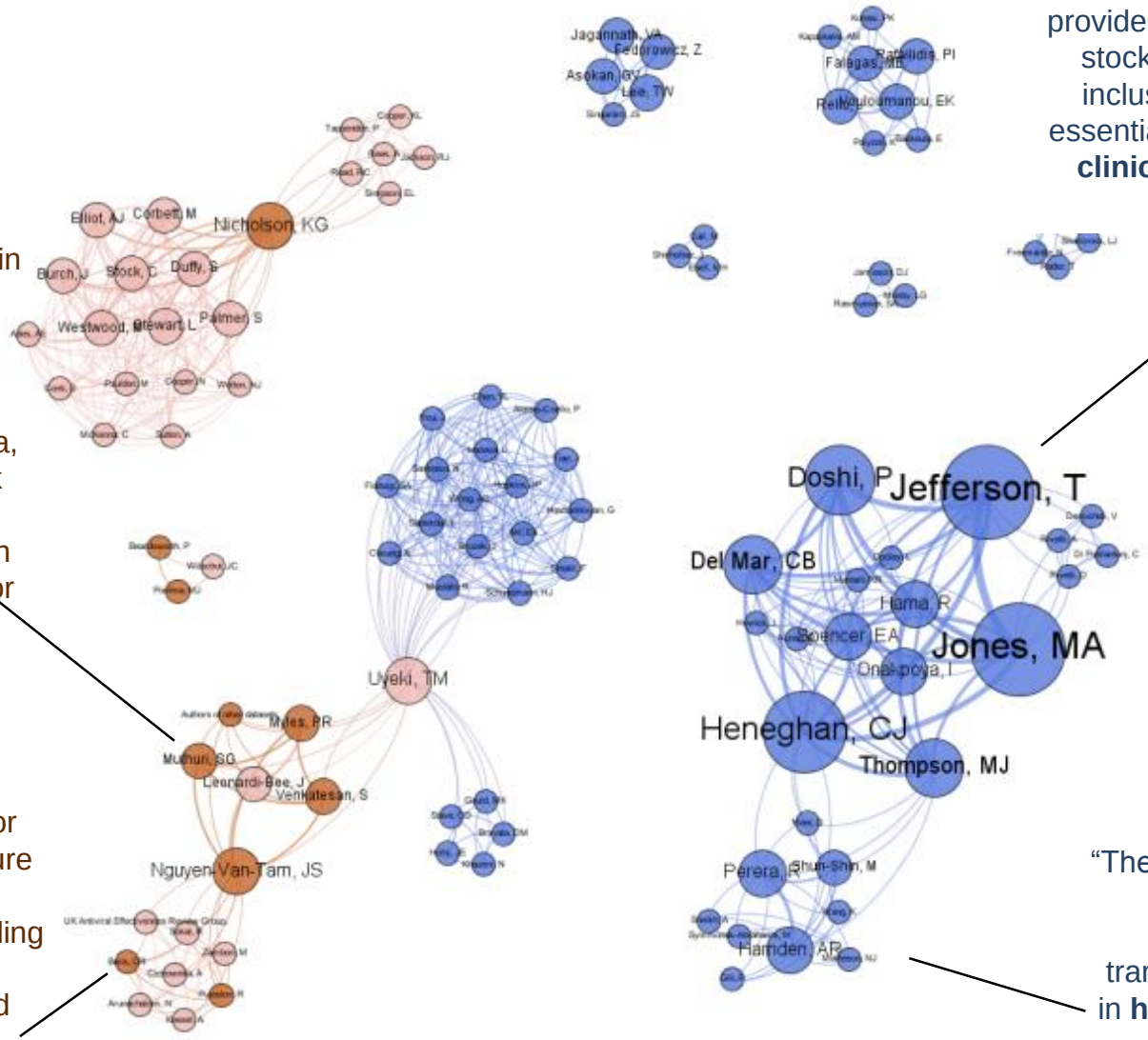
Extract data
- Extract evidence from studies
- Construct evidence tables
- Assess quality of studies

Analyze and synthesize data
- Assess applicability of studies
- Apply qualitative methods
- Apply quantitative methods
- Assess the strength of evidence

Report findings

"…We believe these findings provide reason to question the stockpiling of oseltamivir, its inclusion on the WHO list of essential drugs, and its **use in clinical practice** as an anti-influenza drug."

"encourage early initiation of neuraminidase inhibitor treatment in **outpatients** who are appreciably unwell with suspected or confirmed influenza, or at increased risk of complications, including those with influenza A H3N2 or influenza B."



"NAIs should be deployed during a future pandemic for either post-exposure **prophylaxis or treatment** depending on national policy considerations and logistics."

"The benefit of oseltamivir and zanamivir in preventing the transmission of influenza in **households** is modest and based on weak evidence."

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Evidence-surveillance lab

Dr Adam Dunn

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- Population level surveillance of the creation and ‘spread’ of evidence
- Looking for signals of ‘outbreaks’ of distortions in evidence or its uptake, early-warning of errors

- Is the evidence-base trustworthy?
  - Financial conflicts of interest
  - Unusual divergence of views eg drug efficacy/safety

- Is the evidence being listened to?
  - Population sentiment eg vaccination refusal

eHealth safety

A/Prof Farah Magrabi

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Analysed: 1,385 eHealth incidents since 2009

SA Health

FDA U.S. Food and Drug Administration

NHS England

Output: Classification of HIT errors

Translation: Classification has become de facto international standard

- 5,016 IT incidents

NHS WALES GIG CYMRU

ECRI Institute
The Discipline of Science. The Integrity of Independence.

COMMONWEALTH OF PENNSYLVANIA
PATIENT SAFETY AUTHORITY

Review of safety processes

nehta

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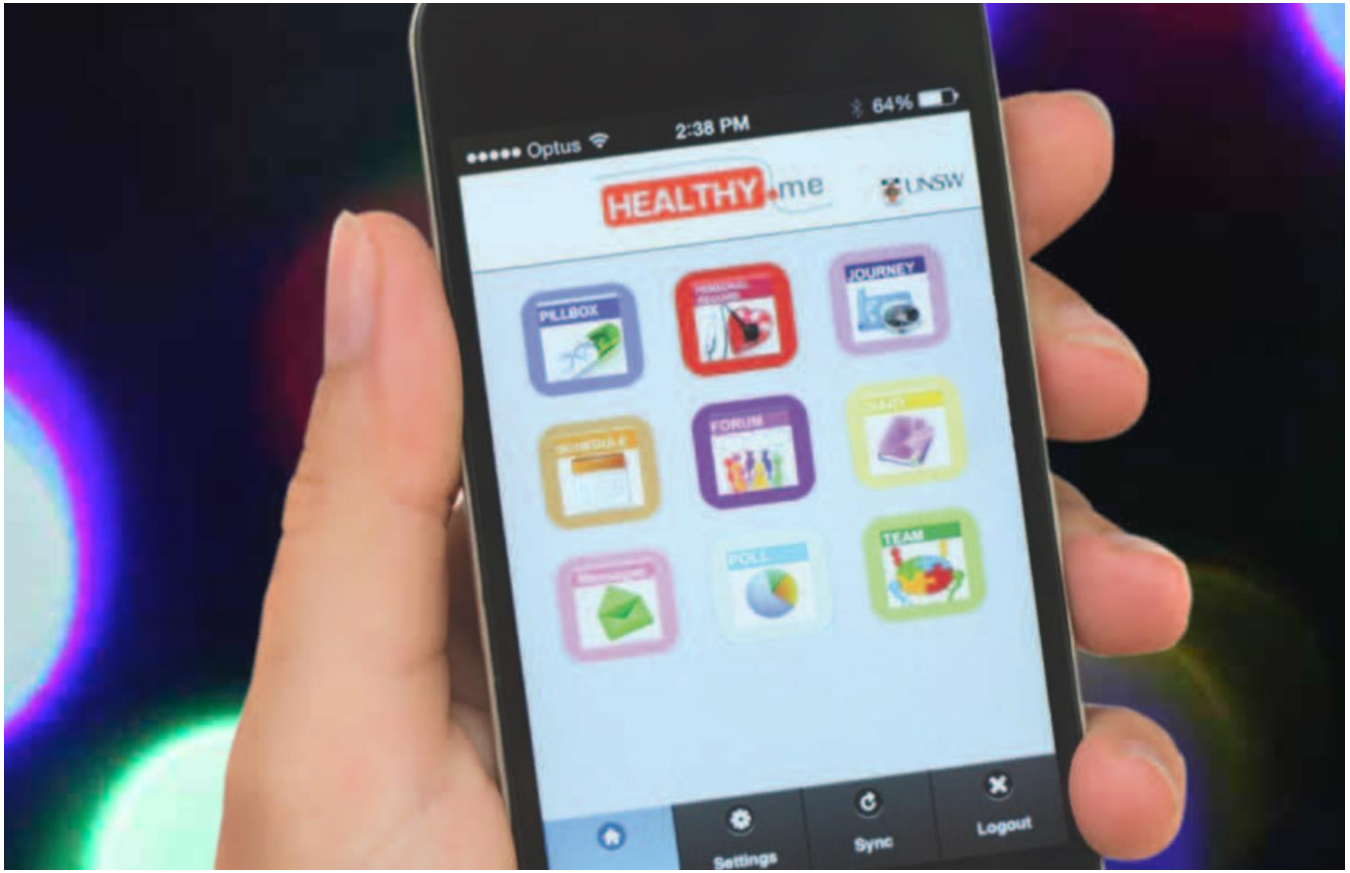
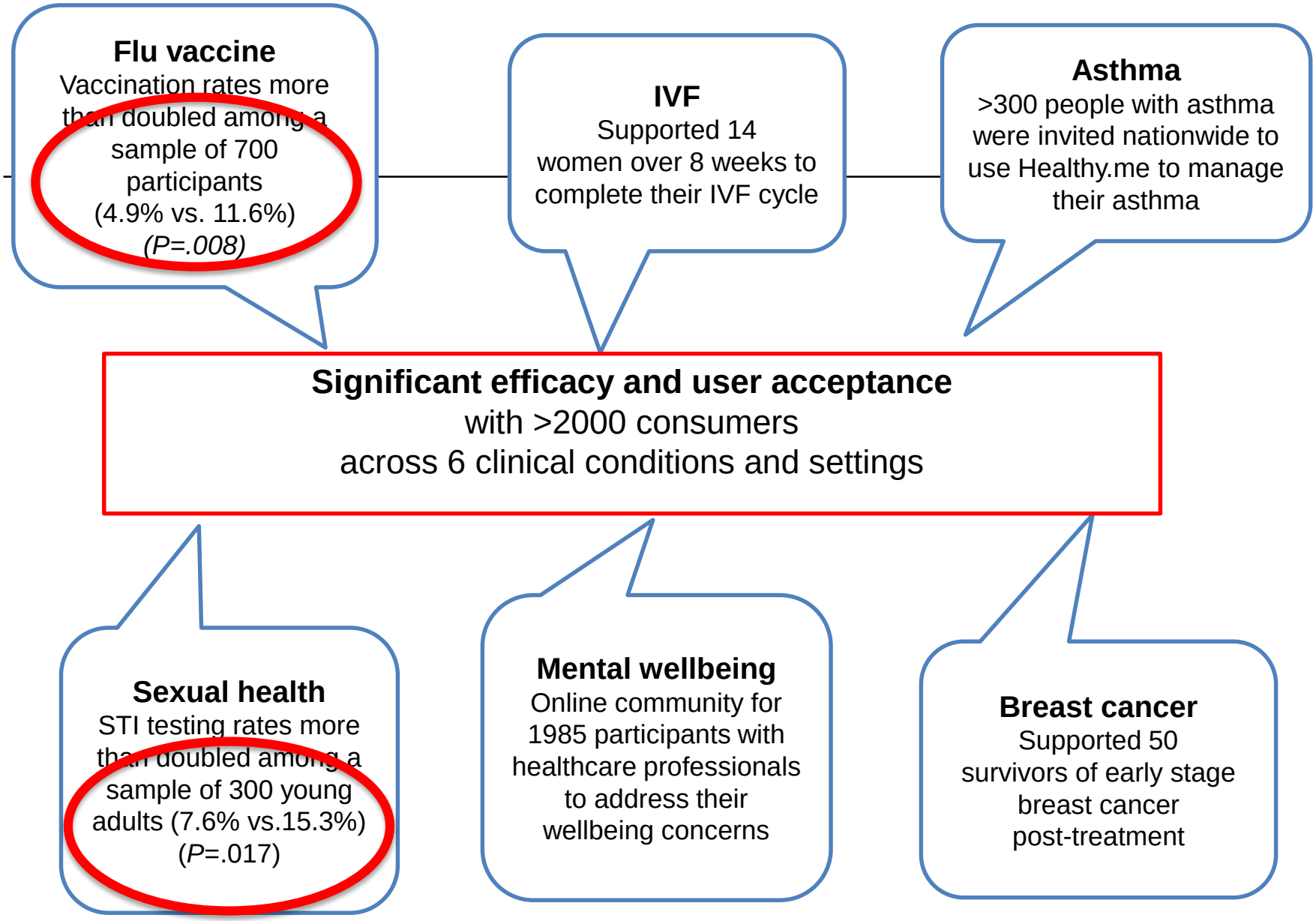
Consumer informatics

Dr Annie Lau





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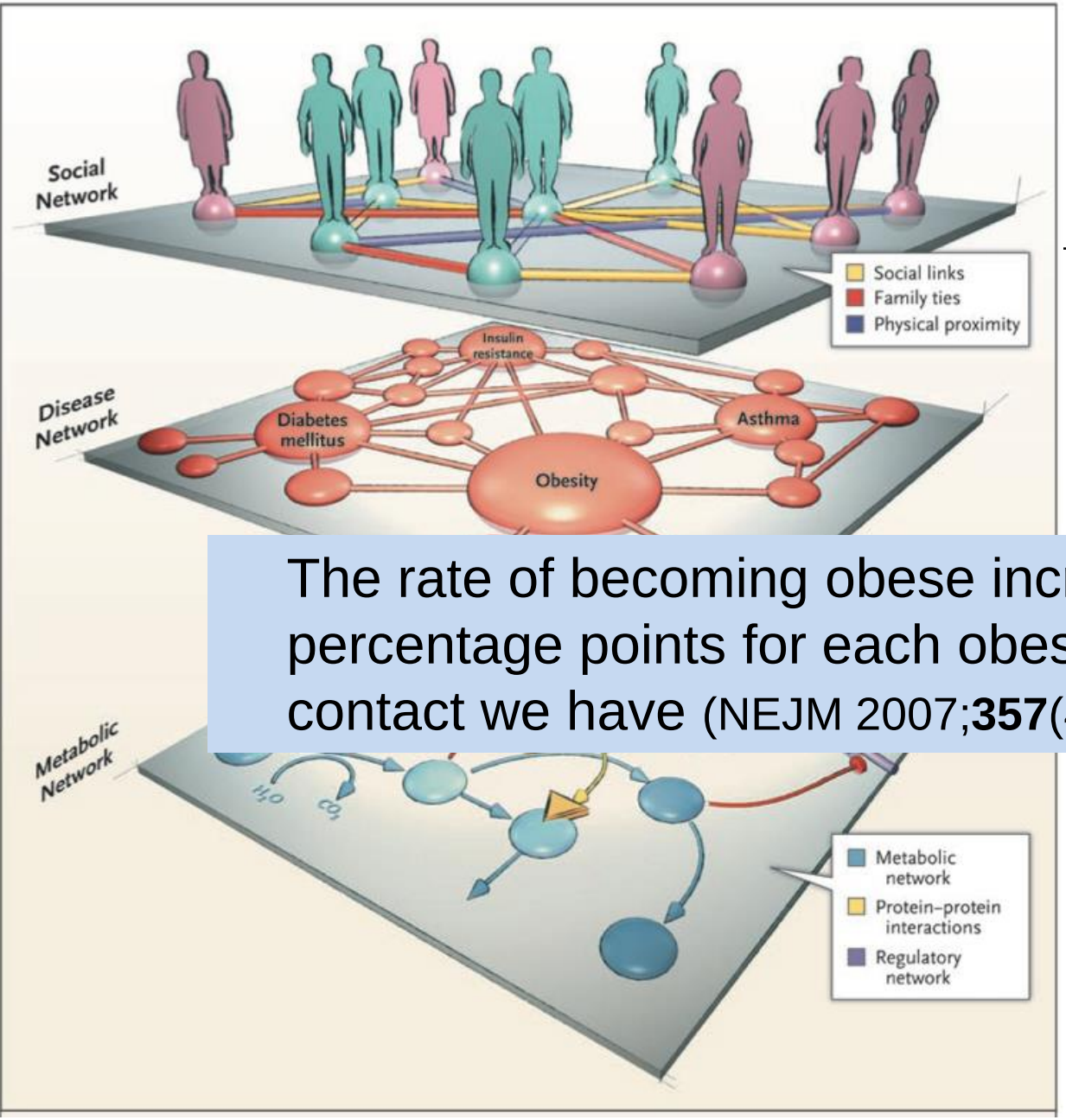

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Obesity has strong social network effects

The rate of becoming obese increases by 0.5 percentage points for each obese social contact we have (NEJM 2007;**357**(4):370-79

Network interventions may 'treat' obesity

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Thank you

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Centre for Health Systems and Safety Research

Professor Johanna Westbrook

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Programs of Research

- Medication Safety and e-Health
- Communication and Work Innovation
- Human Factors & eHealth
- Pathology and Imaging Informatics
- Safety & Integration of Aged and Community Care Services

Research Methods Development

Medication Safety and eHealth

Electronic medication management systems (eMM)

- Medication errors – single most preventable cause of patient harm
- 5.8 prescribing errors/adm
- 25% of all medications administered had at least one error
- 2-3% of admissions are medication related

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Do electronic medication management systems (eMM) reduce errors?

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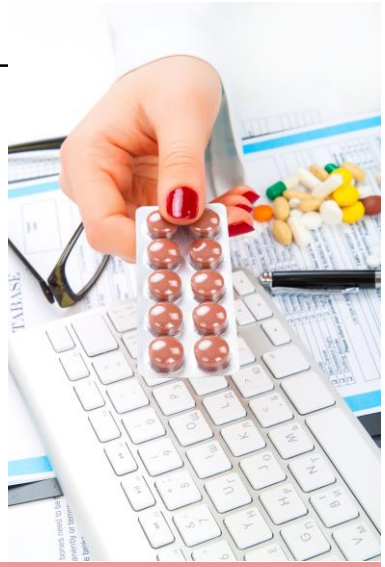
OPEN ACCESS Freely available online

PLoS MEDICINE

Effects of Two Commercial Electronic Prescribing Systems on Prescribing Error Rates in Hospital In-Patients: A Before and After Study

Johanna I. Westbrook[1]*, Margaret Reckmann[1], Ling Li[1], William B. Runciman[2], Rosemary Burke[3], Connie Lo[1¤], Melissa T. Baysari[4], Jeffrey Braithwaite[5], Richard O. Day[6]

January 2012 | Volume 9 | Issue 1 | e1001164



Sample: 3200 patient admissions; 17,000 prescribing errors

Prescribing errors declined by >50% (p<0.0001)

44% (p=0.0002) reduction in serious prescribing error rate

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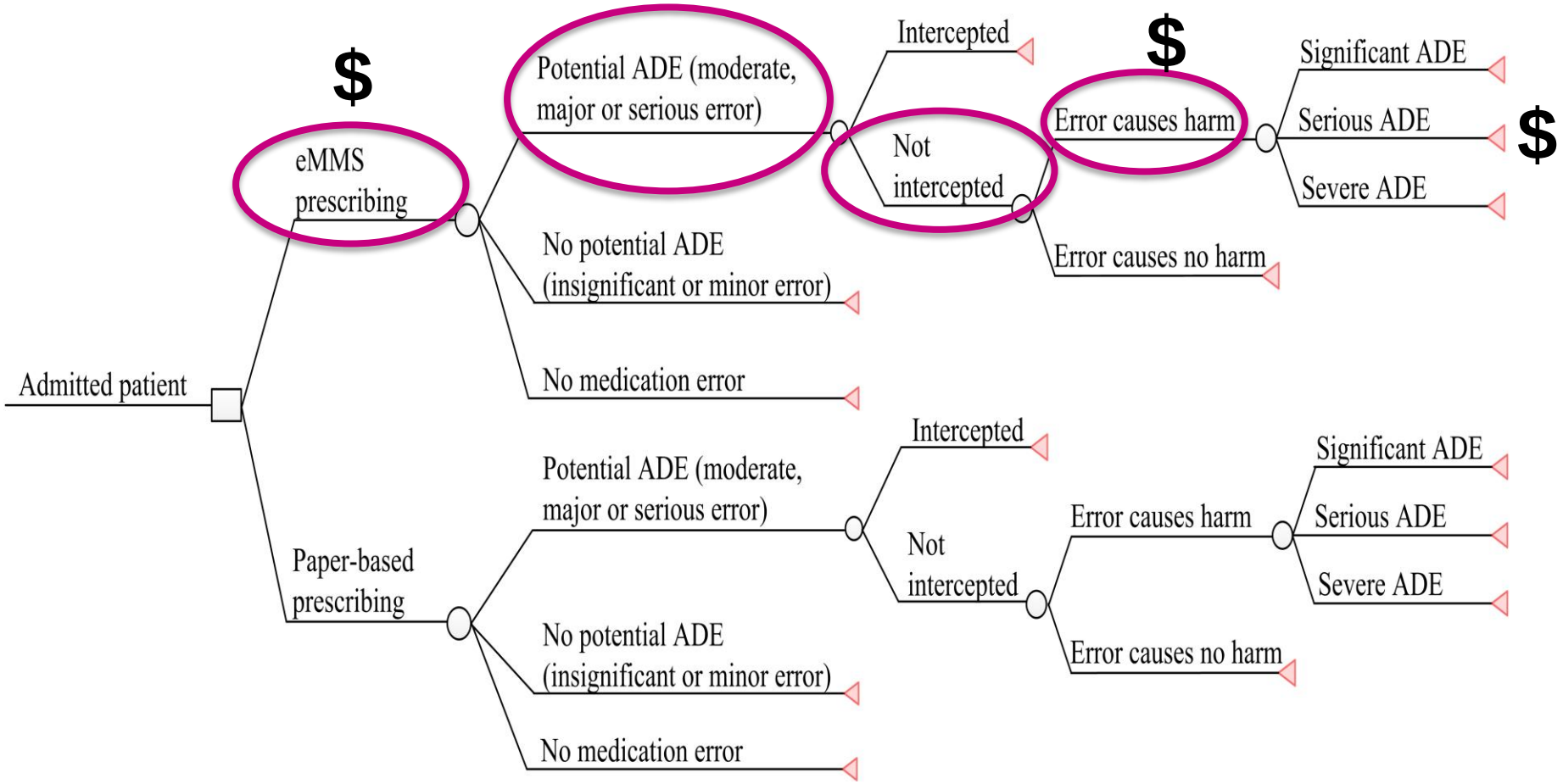
Cost-effectiveness analysis of a hospital electronic medication management system

RECEIVED 24 September 2014
REVISED 16 October 2014
ACCEPTED 25 October 2014

J Am Med Inform Assoc 2015

Johanna I Westbrook[1], Elena Gospodarevskaya[2], Ling Li[3], Katrina L Richardson[4], David Roffe[5], Maureen Heywood[6], Richard O Day[7], Nicholas Graves[8]

AMIA INFORMATICS PROFESSIONALS. LEADING THE WAY.
OXFORD UNIVERSITY PRESS



Results

- **eMM – resulted in a saving of $63-66 per admission**
- Cardiology ward = ~$100,000 savings p.a. due to a reduction ~ 80 ADEs p.a.
- Entire hospital with 39,000 annual admissions = $2.5M each year in savings

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New Errors !

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Available at JAMIA.BMJ.Com Research and applications

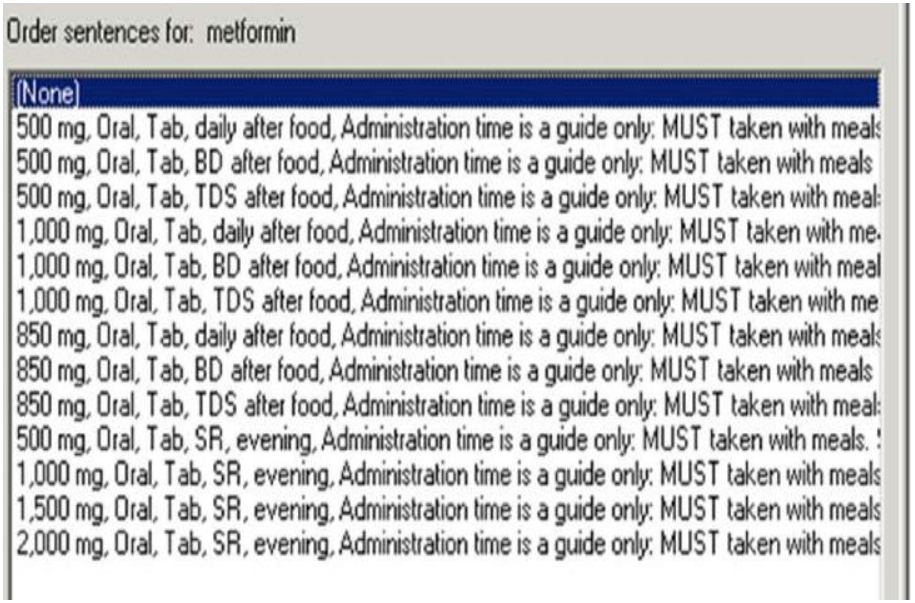
The safety of electronic prescribing: manifestations, mechanisms, and rates of system-related errors associated with two commercial systems in hospitals

Johanna I Westbrook,[1] Melissa T Baysari,[2] Ling Li,[1] Rosemary Burke,[3] Katrina L Richardson,[4] Richard O Day[5,6]

J Am Med Inform Assoc 2013;

- Occurred frequently, but low risk of patient harm
- Most frequent type

  Incorrect selection from drop-down menus = 43%



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Delivering safe and effective care for children in hospital with eHealth systems

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NHMRC Partnership Grant ($1.1m)

Sydney Children's Hospital Network
NSW Kids & Families
eHealth NSW Ministry for Health

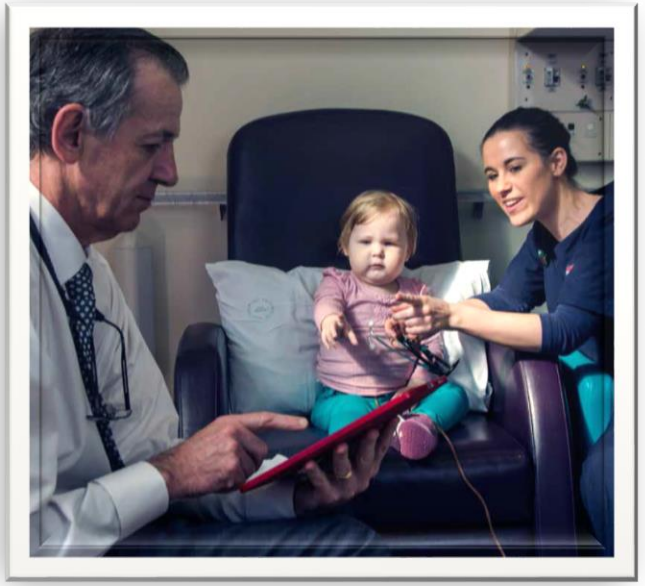
Measure changes in adverse drug events

Assess the impact of an electronic medical record on work of oncologists

Apply findings to make changes prior to site 2 implementation

Conduct a c-e study

Study Design: Stepped wedge cluster randomised controlled trial



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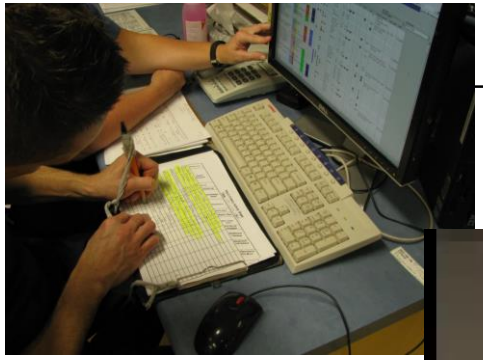
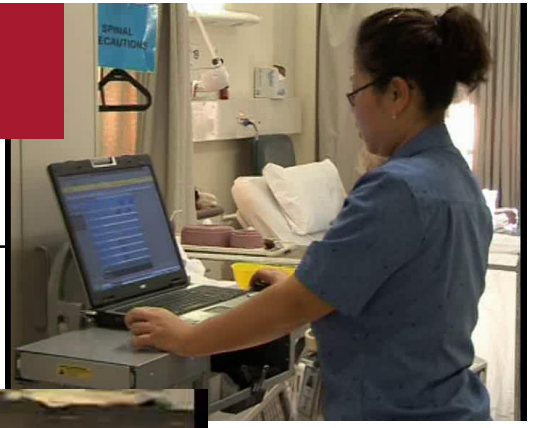
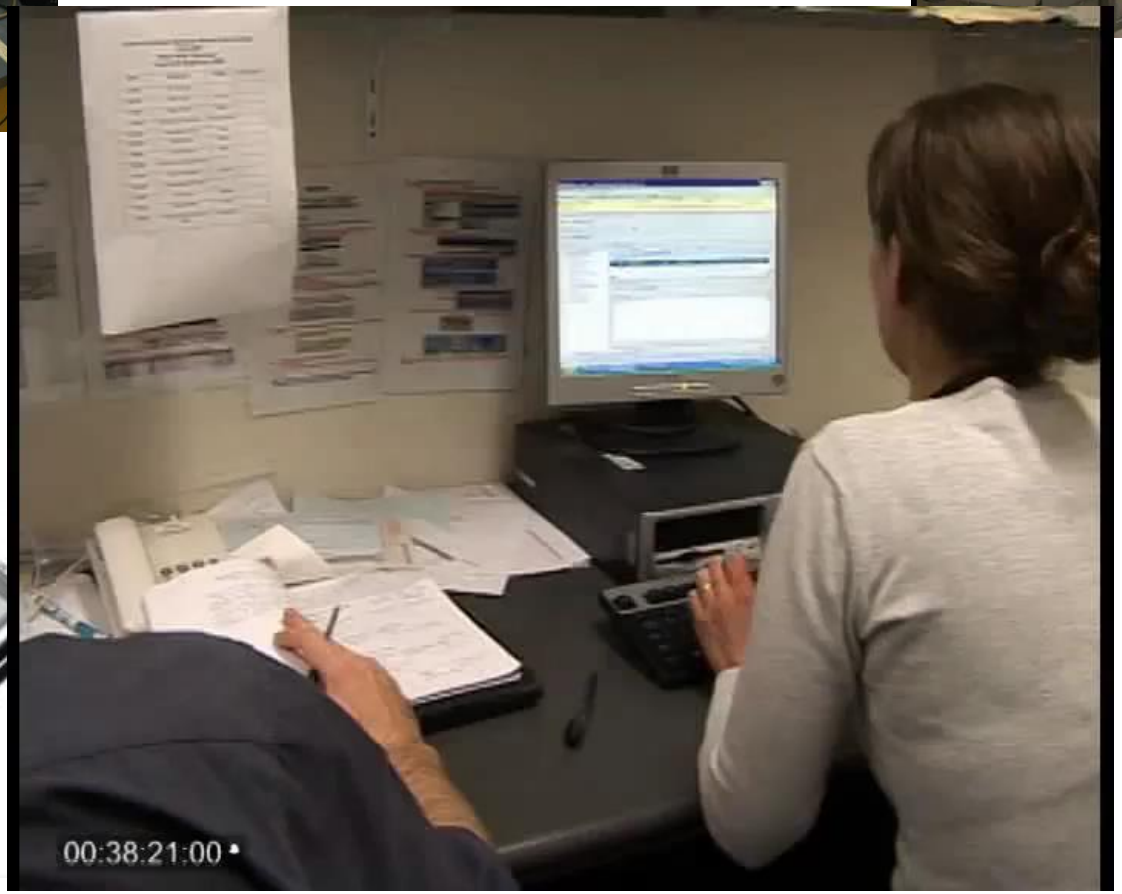
Communication & Work Innovation



Hybrid systems

Physical environment





Integration with workflow

Role of mobility

Direct Observations Nurses & Doctors

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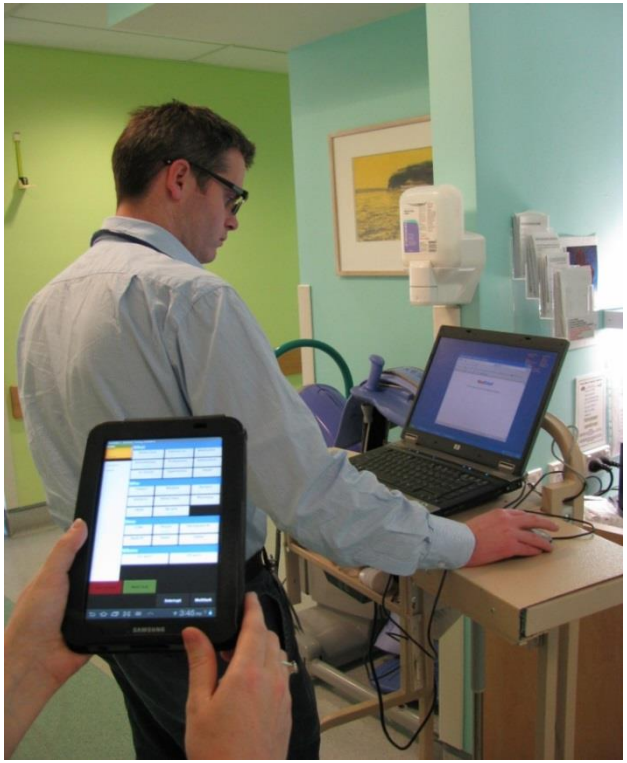
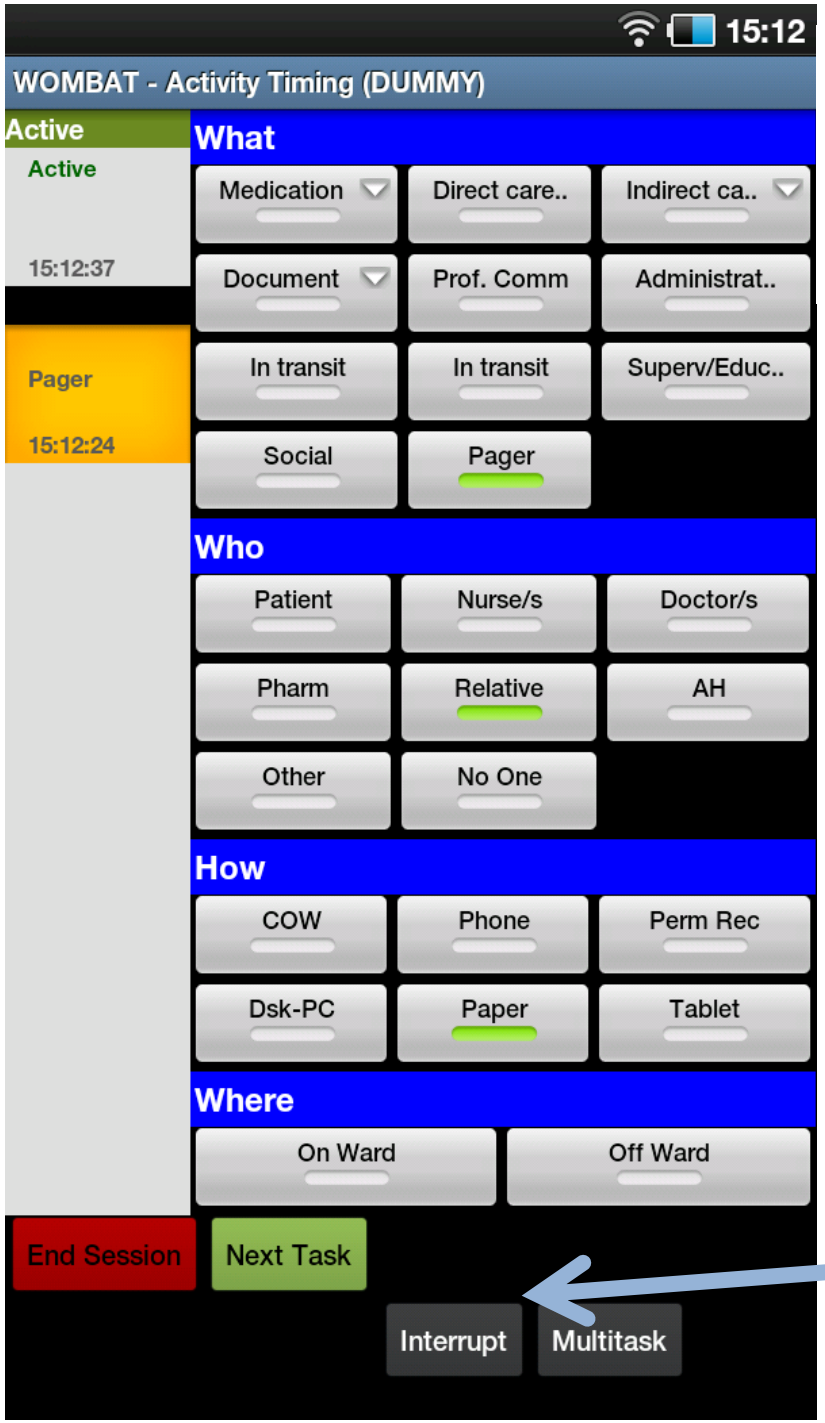


Managing competing demands through task-switching and multitasking: a multi-setting observational study of 200 clinicians over 1000 hours

Scott R Walter,[1] Ling Li,[1] William T M Dunsmuir,[2] Johanna I Westbrook[1]



Work Observation Method By Activity Timing - WOMBAT

What task?

With whom?

With what?

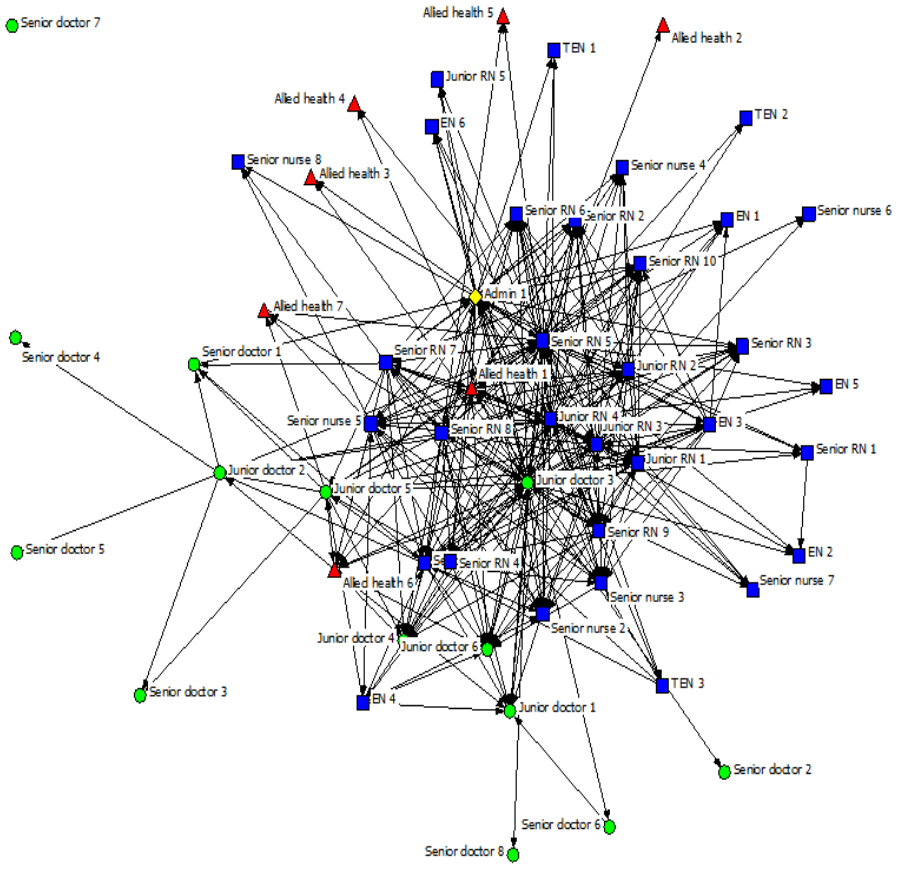
Where?

Interruptions

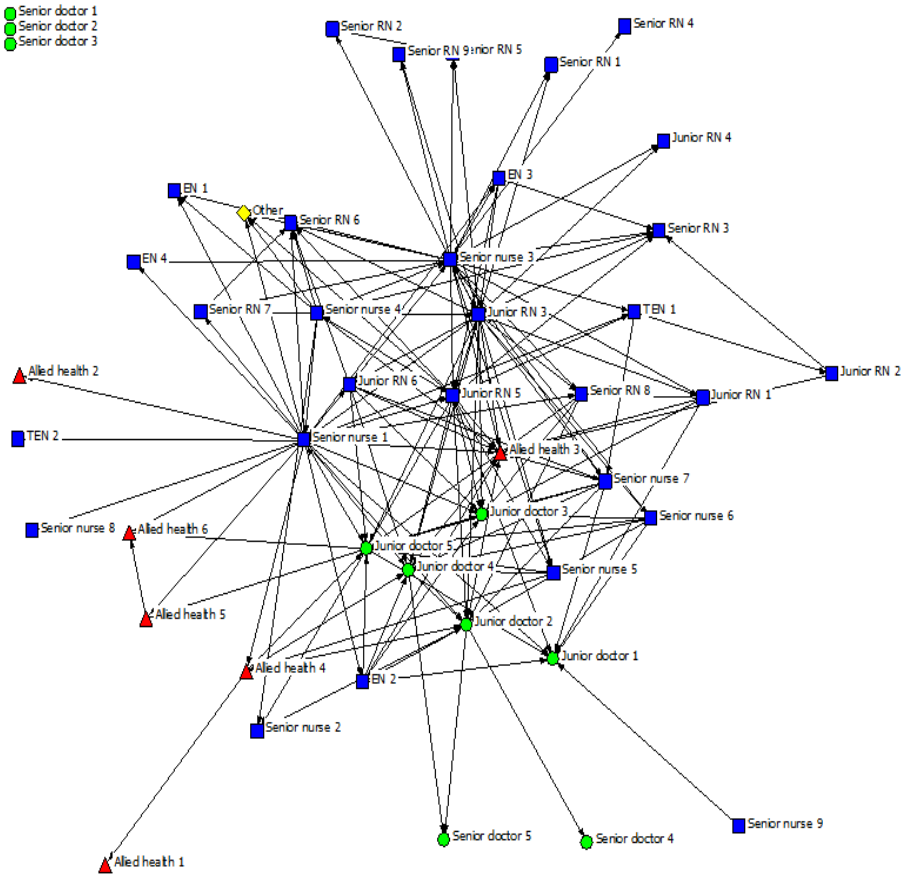
Social Network Analysis to investigate communication

Who do you seek medication advice from at least weekly on your ward?

9.0/100 patient days
Prescribing error rate
N=428 admissions



19.4 / 100 patient days
Prescribing error rate
N=240 admissions



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Human Factors & eHealth

Understanding how to design systems that positively impact care and the work of clinicians

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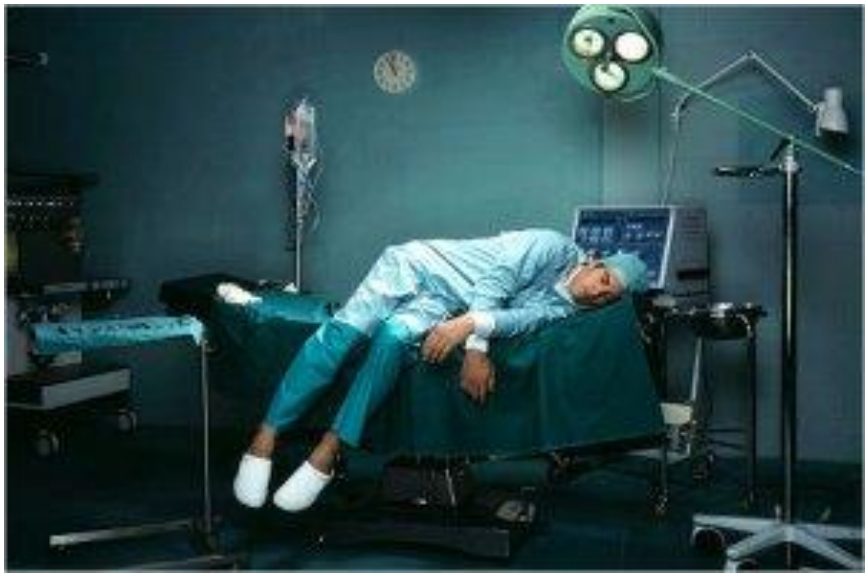

The influence of computerized decision support on prescribing during ward-rounds: are the decision-makers targeted?

Melissa T Baysari,[1] Johanna I Westbrook,[2] Katrina L Richardson,[3] Richard O Day[4,5]

Junior doctors' prescribing work after-hours and the impact of computerized decision support

Samantha L. Jaensch[a,b], *Melissa T. Baysari*[b,c,*], *Richard O. Day*[a,b], *Johanna I. Westbrook*[d]

INTERNATIONAL JOURNAL OF MEDICAL INFORMATICS 82 (2013) 980–986

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Pathology and Imaging Informatics

The Rate of Missed Test Results in an Emergency Department

An Evaluation Using an Electronic Test Order and Results Viewing System

Methods Inf Med 1/2010

J. Callen[1]; R. Paoloni[2]; A. Georgiou[1]; M. Prgomet[1]; J. Westbrook[1]

The safety implications of missed test results for hospitalised patients: a systematic review

BMJQS

Joanne Callen, Andrew Georgiou, Julie Li, et al.

BMJ Qual Saf 2011 20: 194-199 originally published online February 7, 2011

Journal of
CLINICAL PATHOLOGY

Troponin testing in the emergency department: a longitudinal study to assess the impact and sustainability of decision support strategies

Andrew Georgiou,[1] Mary Lam,[2] Jane Allardice,[3] Graeme K Hart,[4,5] Johanna I Westbrook[1]

J Clin Pathol 2012;**65**:546–550. doi:10.1136/jclinpath-2011-200610

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Development of an evaluation model for assessing the effectiveness of ICT to integrate services and improve service performance and the experience of clients

ARC Linkage Grant 2012-2016 $914,000

Prof J Westbrook and Ass/Prof A Georgiou

UnitingCare Ageing

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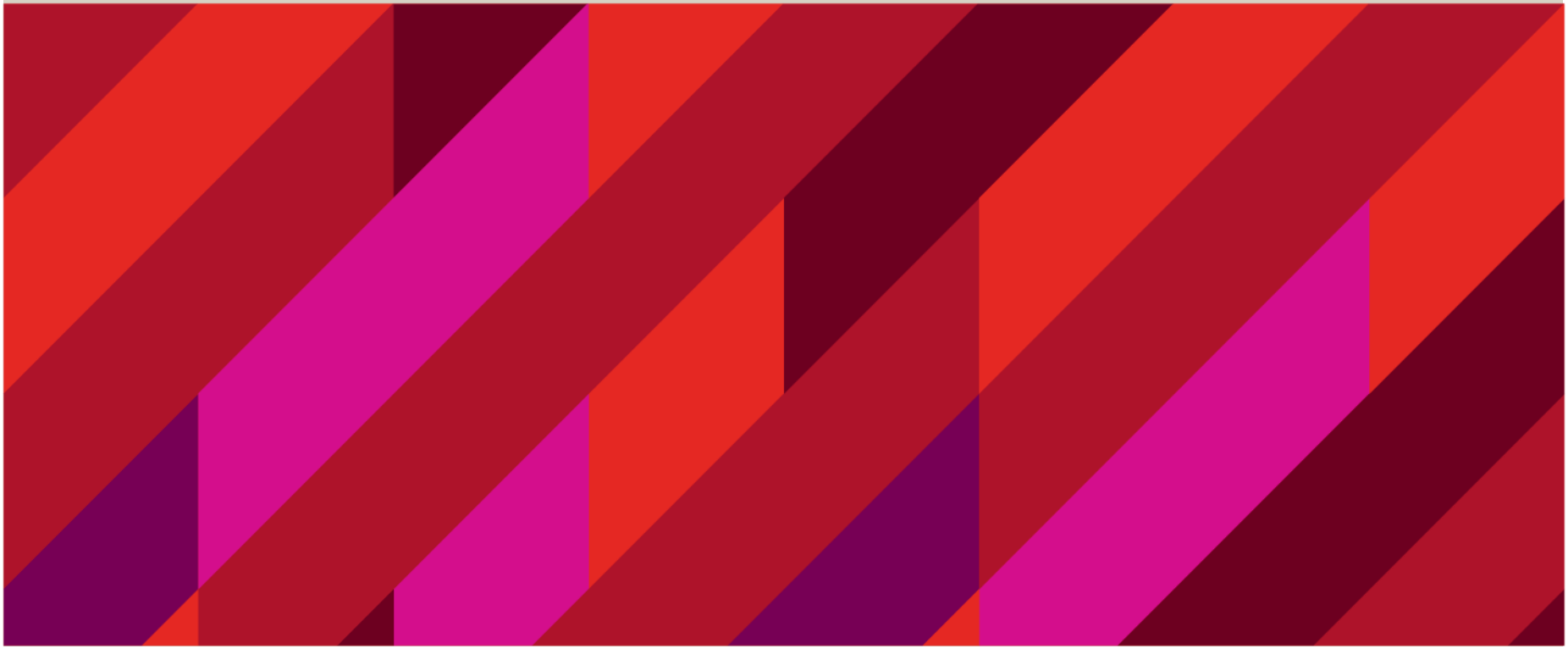
AIHI Research Symposium 2015

Centre for Healthcare Resilience and Implementation Science (CHRIS)



Background to the Centre

The Centre for Healthcare Resilience and Implementation Science undertakes **strategic research, evaluations and research-based projects** of national and international standing with a core interest **to investigate health sector issues of policy, culture, systems, governance and leadership**.

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CHRIS – Research Streams

Appropriateness of Care: Delivering healthcare in line with evidence

Improvement Studies: Enhancing systems, organisations and care

Behaviour Change: Appling methods and interventions

Implementation Science: Guiding improved change models

Human Factors and Resilience: Safer, more effective everyday care

Health Outcomes: Reducing harm and enhancing care

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DUQuA

Deepening our Understanding of Quality in Australia

Professor Jeffrey Braithwaite
Dr Natalie Taylor
Dr Robyn Clay-Williams
Ms Emily Hogden
Ms Victoria Pye
Ms Michelle Li

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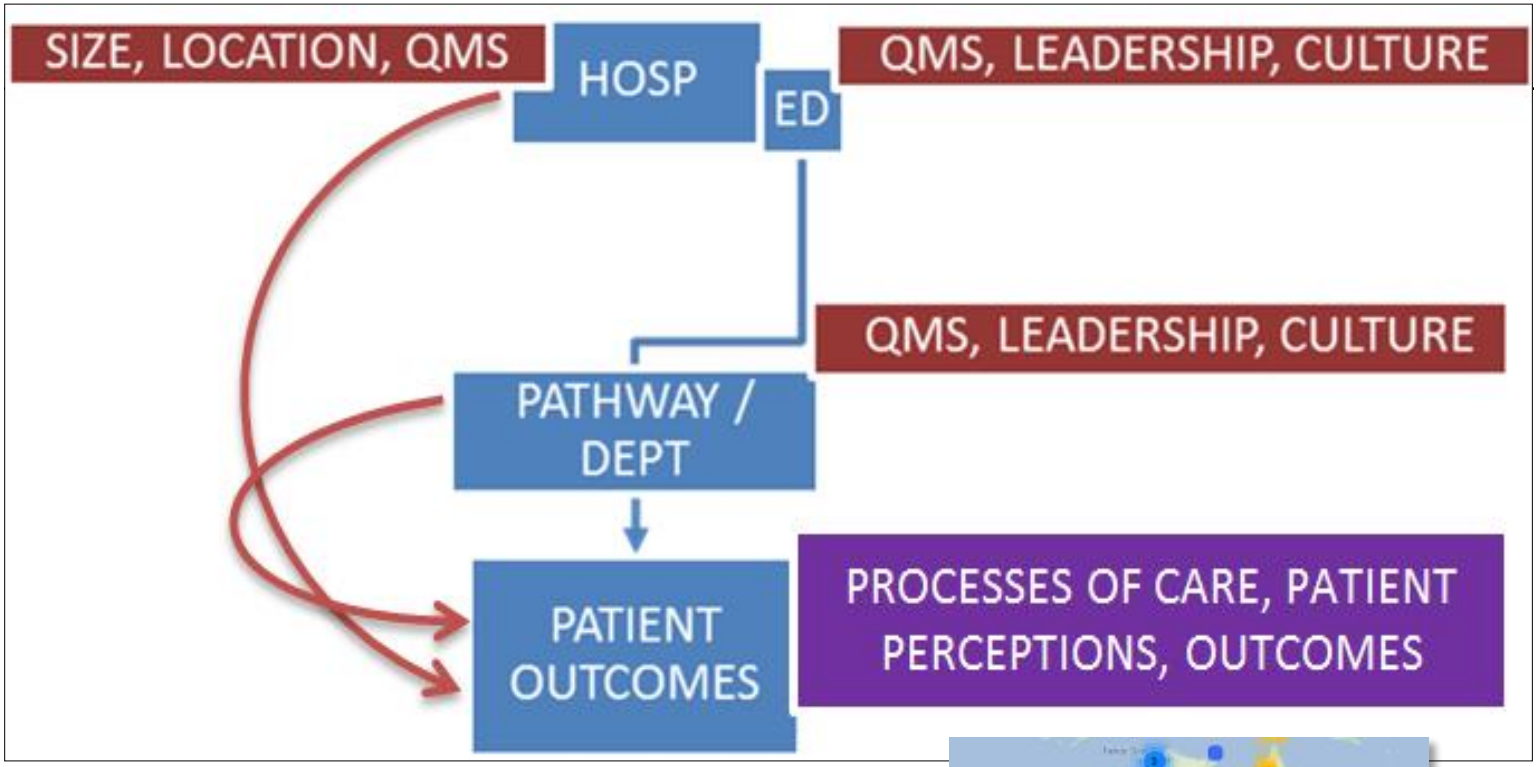
DUQuA



Patient outcomes for:

1. Stroke
2. AMI
3. Hip fracture

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ACCREDIT

Accreditation Collaborative for the Conduct of REsearch and Designated Investigations through Teamwork

Professor Jeffrey Braithwaite
Professor Johanna Westbrook
A/Professor David Greenfield
Dr Anne Hogden
Dr Deborah Debono

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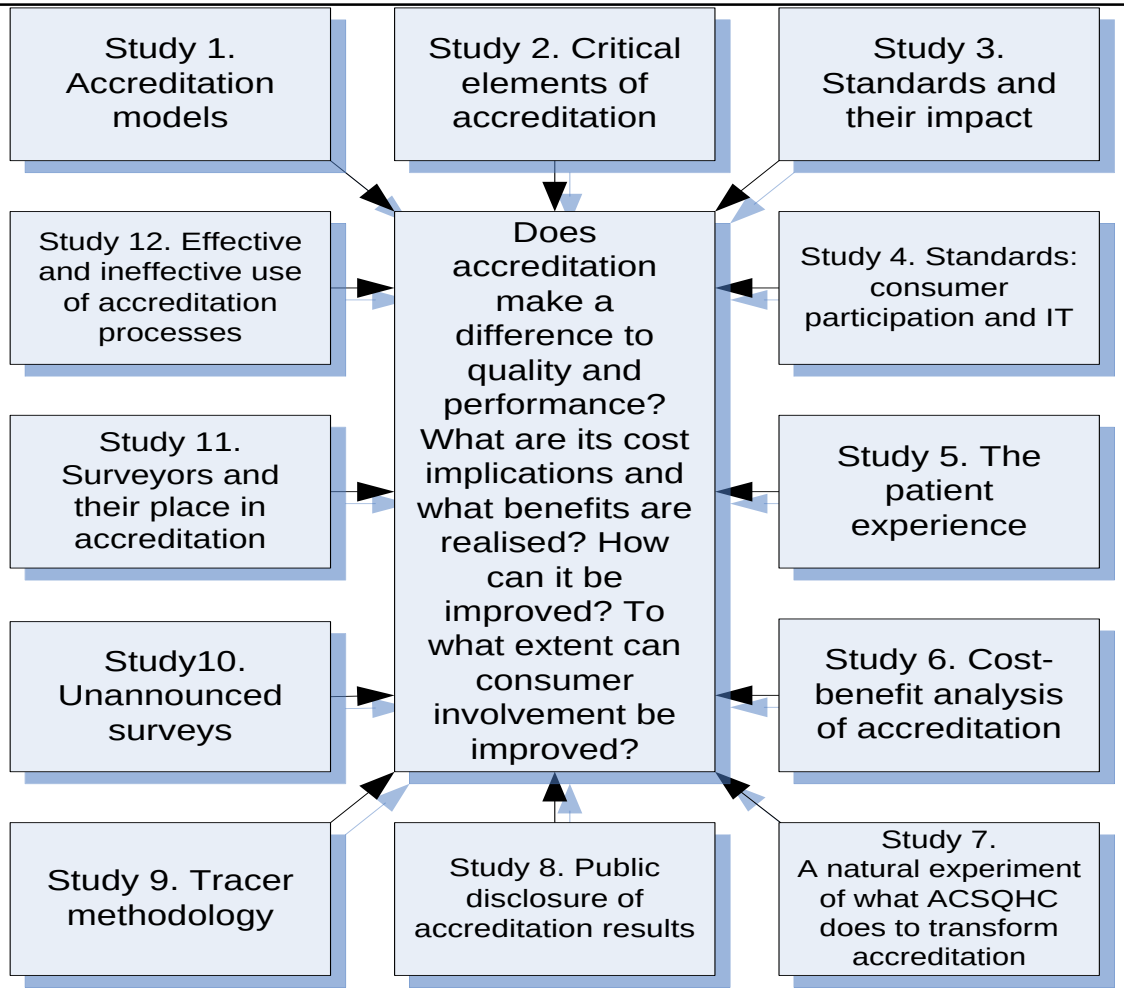
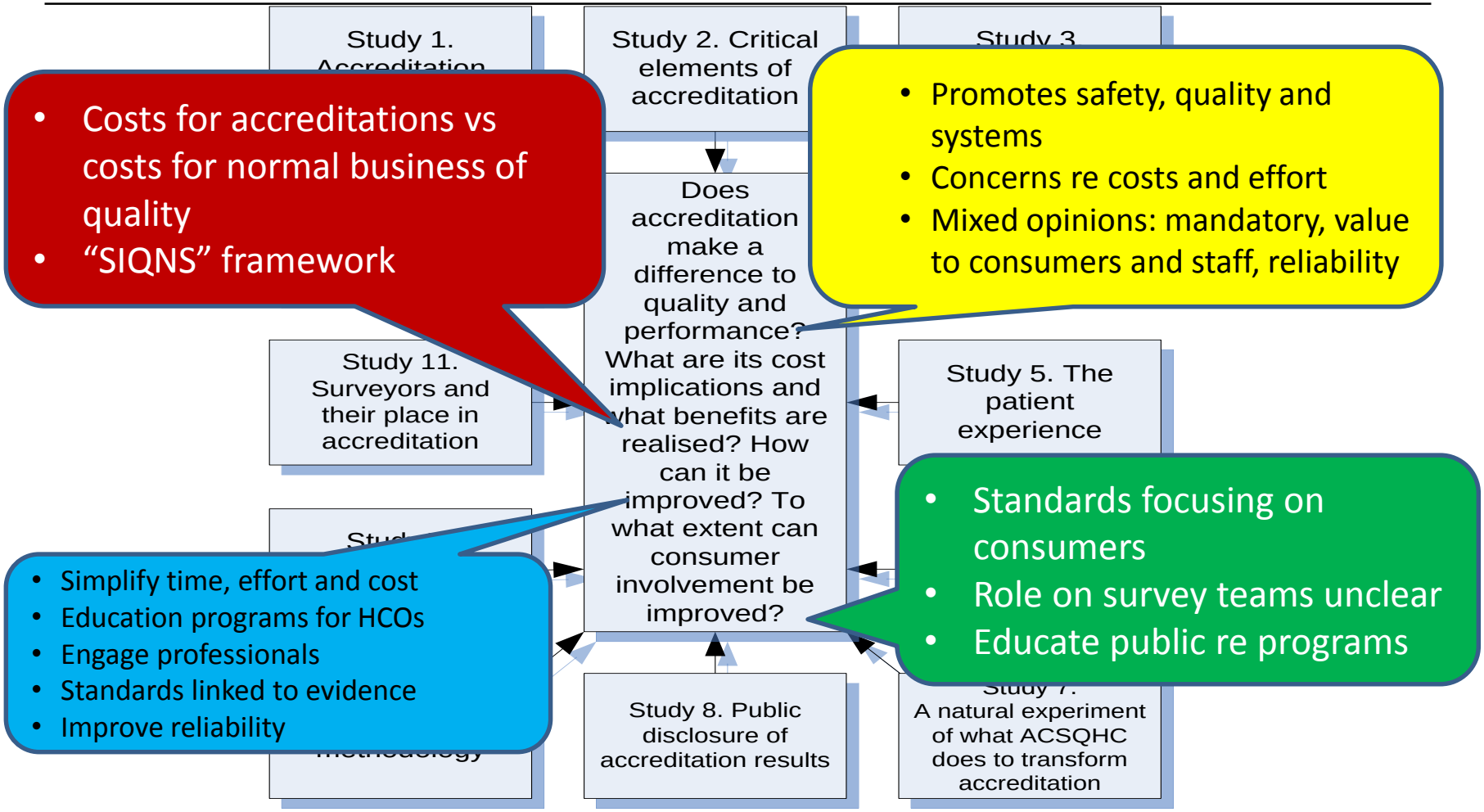
ACCREDIT


Study 1. Accreditation models
Study 2. Critical elements of accreditation
Study 3. Standards and their impact
Study 12. Effective and ineffective use of accreditation processes
Does accreditation make a difference to quality and performance? What are its cost implications and what benefits are realised? How can it be improved? To what extent can consumer involvement be improved?
Study 4. Standards: consumer participation and IT
Study 11. Surveyors and their place in accreditation
Study 5. The patient experience
Study10. Unannounced surveys
Study 6. Cost-benefit analysis of accreditation
Study 9. Tracer methodology
Study 8. Public disclosure of accreditation results
Study 7. A natural experiment of what ACSQHC does to transform accreditation

ACCREDIT


Study 1.
Study 2. Critical elements of accreditation
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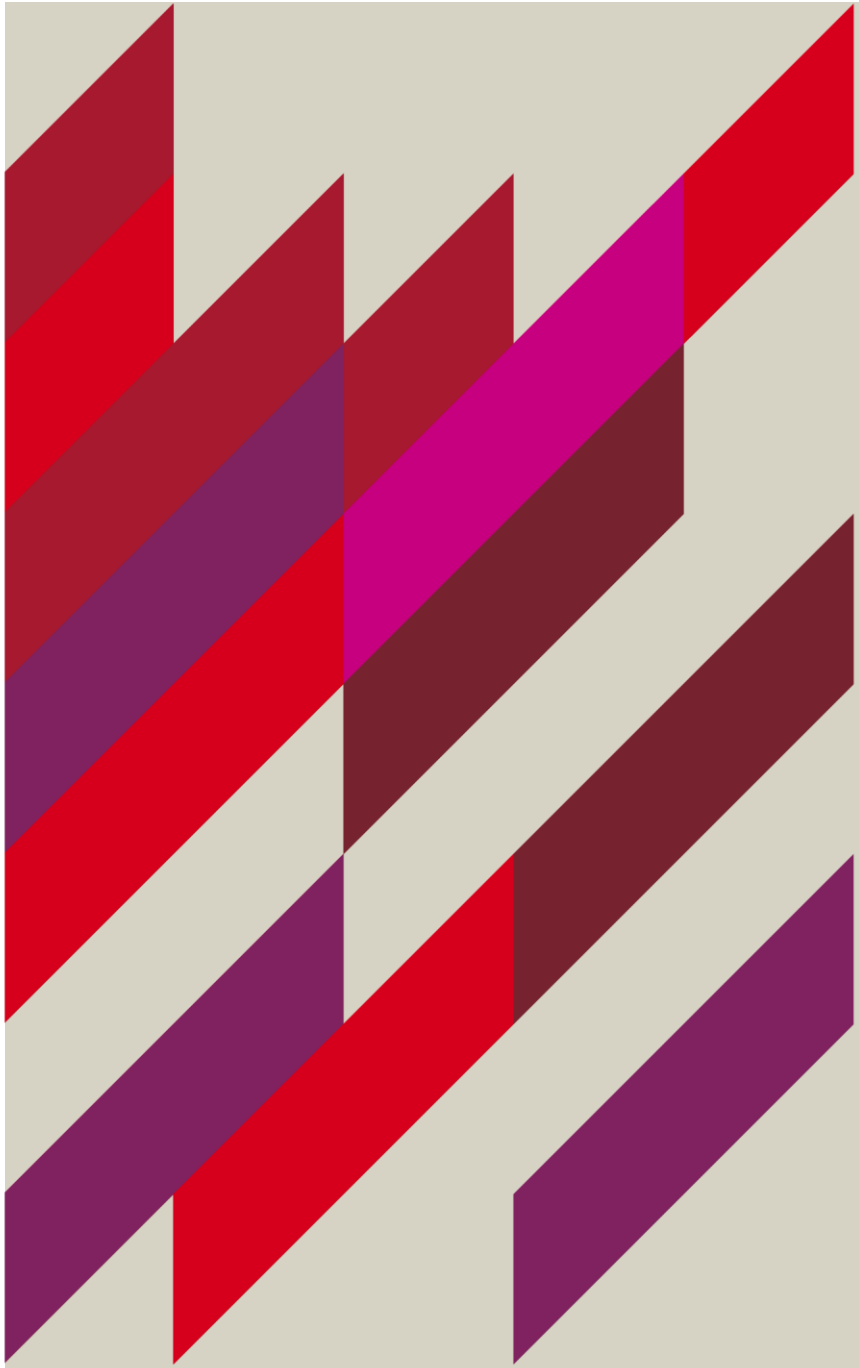
Does accreditation make a difference to quality and performance? What are its cost implications and what benefits are realised? How can it be improved? To what extent can consumer involvement be improved?
Study 11. Surveyors and their place in accreditation
Study 5. The patient experience
Study 8. Public disclosure of accreditation results
A natural experiment of what ACSQHC does to transform accreditation
• Costs for accreditations vs costs for normal business of quality
• "SIQNS" framework
• Promotes safety, quality and systems
• Concerns re costs and effort
• Mixed opinions: mandatory, value to consumers and staff, reliability
• Simplify time, effort and cost
• Education programs for HCOs
• Engage professionals
• Standards linked to evidence
• Improve reliability
• Standards focusing on consumers
• Role on survey teams unclear
• Educate public re programs



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CareTrack Kids

The appropriateness and quality of care delivered to Australian children

Professor Jeffrey Braithwaite
Professor Les White
Professor Adam Jaffe
Professor Chris Cowell
Professor Mark Harris
Mr Peter Hibbert
Mrs Tamara Hooper
Dr Louise Wiles
Ms Victoria Pye
Ms Charli Molloy

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NHMRC Partnership Grant ($2.5m)

BUPA Health Foundation, Sydney Children's Hospital Network, NSW Kids & Families, SA Health, Children's Health QLD, Clinical Excellence Commission

Assess	Measure	Improve
appropriate care – percentage of healthcare encounters	**Adverse events**	**Outcomes**
U.S Mangione-Smith (47% compliance) Evidence or consensus-based care 16 paediatric conditions	Frequency and type	Mobile phone app

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Implementation Science

Creating safe, effective systems of care: the translation challenge

Professor Jeffrey Braithwaite
Professor Johanna Westbrook
Professor Enrico Coiera
Professor Ric Day
Professor Ken Hillman
Professor Bill Runciman
Mr Peter Hibbert

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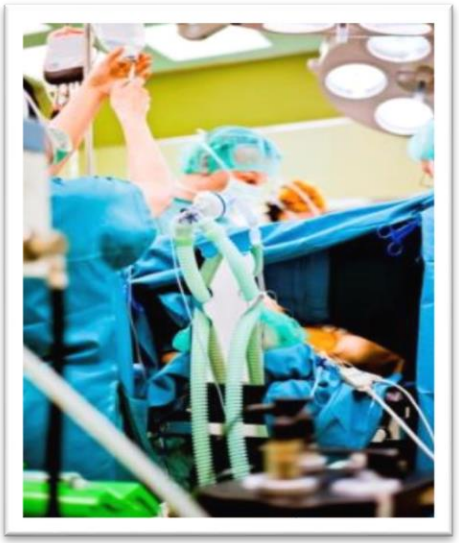
NHMRC Program Grant

Creating safe, effective systems of care: the translational challenge

- Five years: 2014-2018, $10.8 million
- 3rd largest grant awarded by NHMRC in 2012
- Professors Braithwaite, Westbrook and Coiera, MQ
- Professors Ric Day, Bill Runciman and Ken Hillman, Co-Chief Investigators



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Creating safe, effective systems of care: the translational challenge

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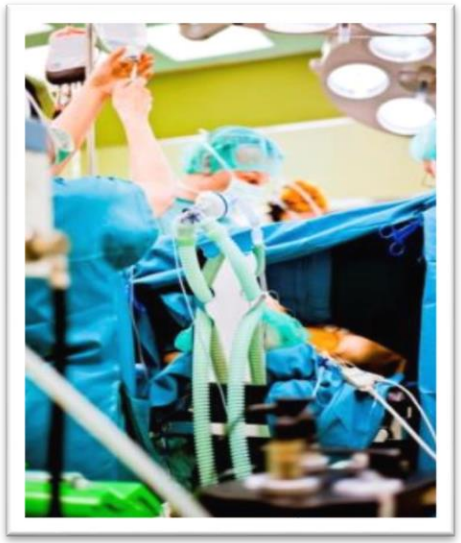
"We are committed to seeing health systems improvement move from a localised, small-scale empirical endeavour, to one that is **theoretically sound**, **done at scale**, and **with widely deployed results**."



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Books – last five years

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Published

- Culture and Climate in Health Care Organizations
- Resilient Health Care
- The Resilience of Everyday Clinical Work
- Healthcare Reform, Quality and Safety

In Press

- Reconciling Work-as-imagined and Work-as-done
- The Sociology of Patient Safety
- Successful Health Care: the Experience of 60 Countries
- Gaps: the Surprising Truth Hiding in the In-between

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