Can Information Technology help us down the evidence based pathway?

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Outline

- The symbiosis between e-Health and Evidence-Based Medicine
- The evidence for e-Health
- The e-Health paradox
- Understand what works, for whom and in what circumstances?

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The importance of Information and Communication Technologies (ICT)

- Previously ICT was a background “niche” system
- Today it is presented as an essential healthcare tool, a prerequisite for safe effective practice

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"[We need] … tools to extend the mind's limited capacity to recall and process large numbers of relevant variables, just as medical science requires the microscope to extend our capacity to see at the microscopic level. We must abandon the arrogance of professional 'expertise' that shuns such tools. Instead, we must use the new tools routinely as they are developed for more and more diagnostic and management problems" (Weed 1997).

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Evidence-Based Medicine

- Conscientious, explicit and current use of best evidence
- Decision making based on science and research evidence
- Not opinion, past practice and precedent

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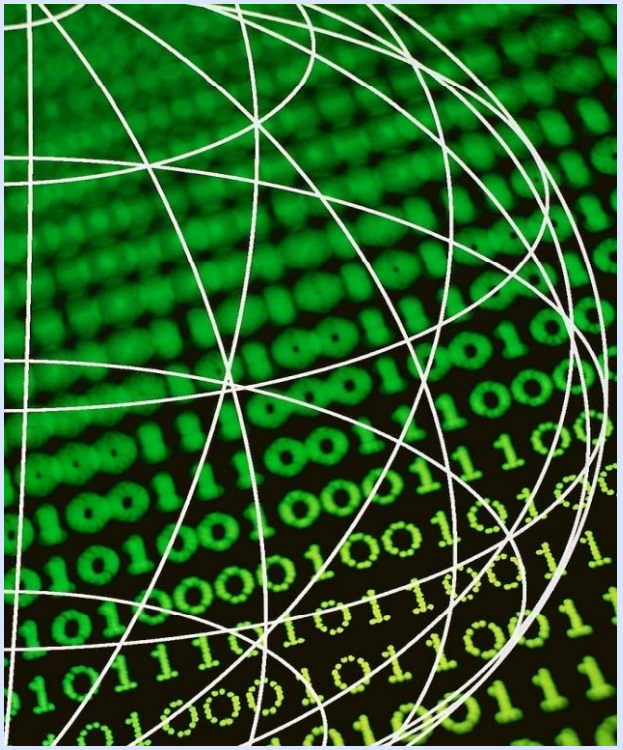
EBM's technological underpinnings*

- IT allows the rapid accumulation of evidence in summarised forms
- IT has made evidence accessible
- IT has provided the infrastructural foundations for EBM



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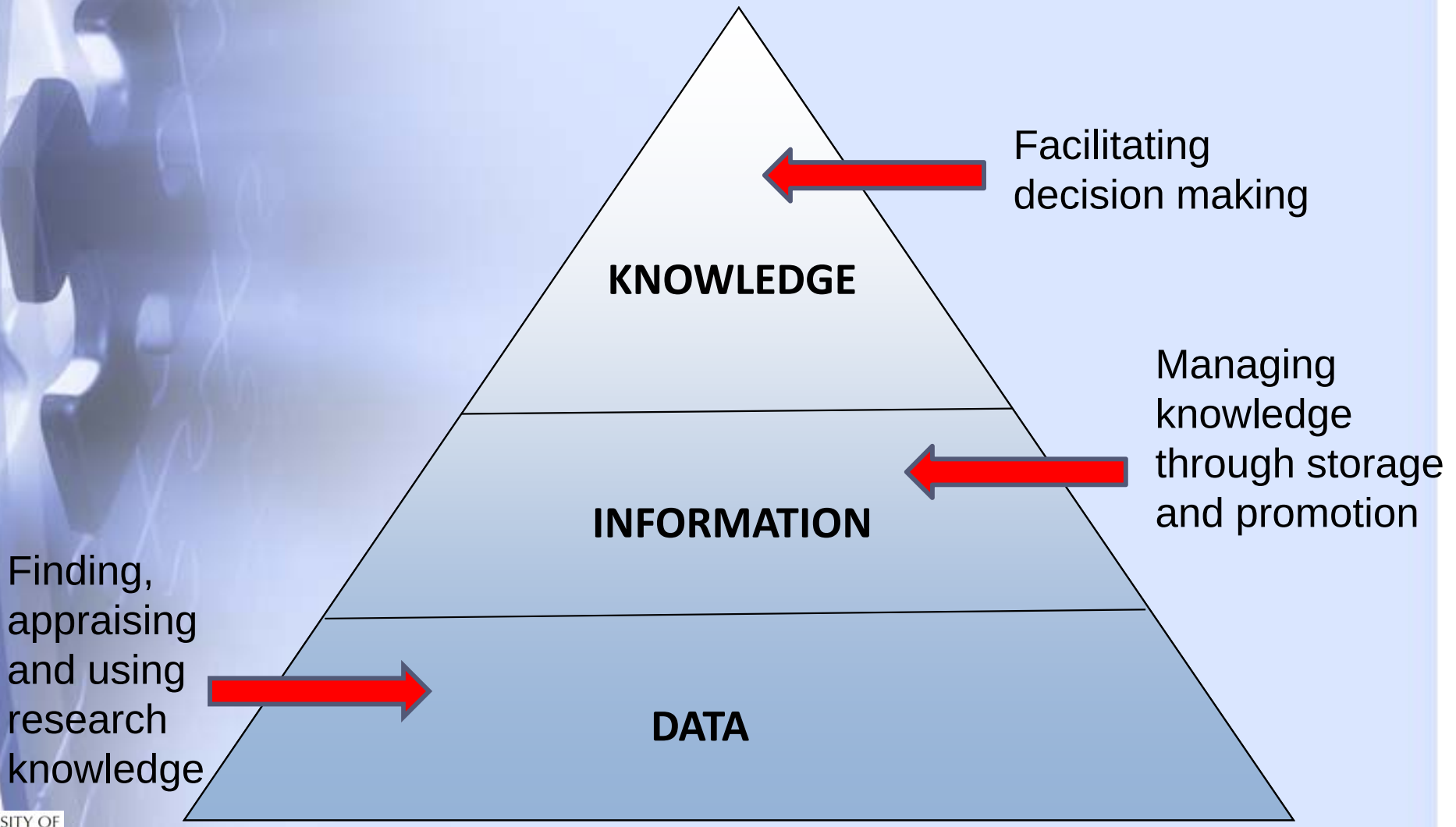
Tudor Hart, The political economy of health care. A clinical perspective 2006

What does EBM* entail?



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*Muir Gray Evidence-based healthcare 1997

Electronic systems – the promise?

- Rapid information retrieval, efficient data management
- Incorporate decision support mechanisms
- Potential to improve quality of care

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Clinical Decision Support Systems

Information systems designed to improve clinical decision making through the provision of clinical knowledge that is stored electronically

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Levels of decision support

- Basic decision support to improve the quality of information and reduce excessive testing
- Intermediate decision support incorporating guidelines and best practice eg, test order sets
- Advanced decision support involving active interaction in response to patient data

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Adverse drug events

- Brigham & Women's Hospital (US)*
- Pre-post study design
- 55% reduction in potential adverse drug events
- From 10.7/1000 patient days to 4.9 per 1000 patient days

* *Bates et al. (1998) Jnl Am Med Inf Assoc*

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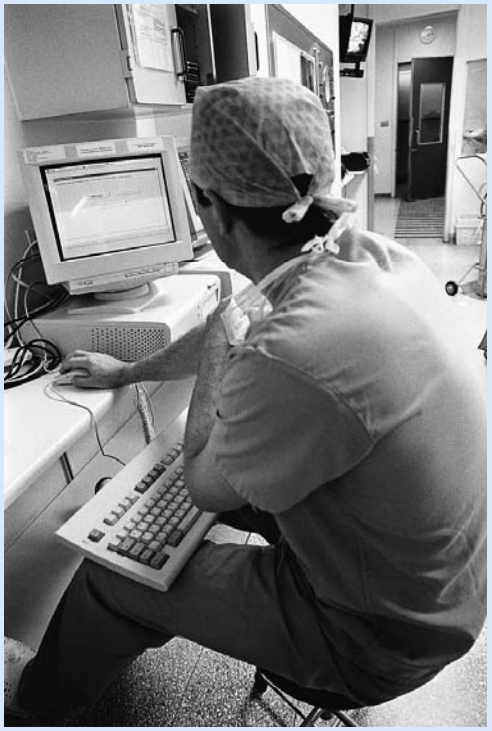
Adherence to guidelines

- Drug ordering behaviour*
- Prompts to use cheaper generic brands
- Increased compliance 6% pre – 94% post



*Teich et al. (2000) Archives of Internal Medicine

Laboratory test ordering

- Time to treatment for critical results*
- Randomised controlled trial
- 38% shorter median time

*Kuperman et al.(1999) JAMIA

Test turnaround time significantly declined* Year 1 by 18.6% , Year 2 by 12.6%

	Period	No. of tests	Mean in minutes (95% CI)
All tests	2003	97851	35.35 (35.11,35.59)
	2004	113752	28.77 (28.59,28.95)
	2005	131022	25.14 (24.99,25.29)

Average number of tests per patient did not change:

92.5 assays/pt vs 103.2 (P=0.23)

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Westbrook et al. Methods of Information in Medicine 2009

Results from Regression Analysis*

TAT was a significant factor contributing to patients' length of stay in ED ($p<0.0001$

**Westbrook et a. MIE 2009*

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The magic bullet?

- 10.3% reduction in Hospital Acquired Infections*
- 17% reduction of inpatient adverse drug events
- 22% gain in clinical staff productivity
- 48% reduction in duplicate laboratory tests
- 7% reduction in average length of stay

**e-Health for a Healthier Europe! (The Gartner report 2009) on behalf of the Ministry of Health and Social Affairs in Sweden*

Systematic review* of the impact of ICT in health

- 257 studies (24% from 4 US centres, all home grown systems)
- Only 4% (n=9) studies examined the impact of commercial systems
- Very few Australian studies
- Challenges for Australian health care organisations

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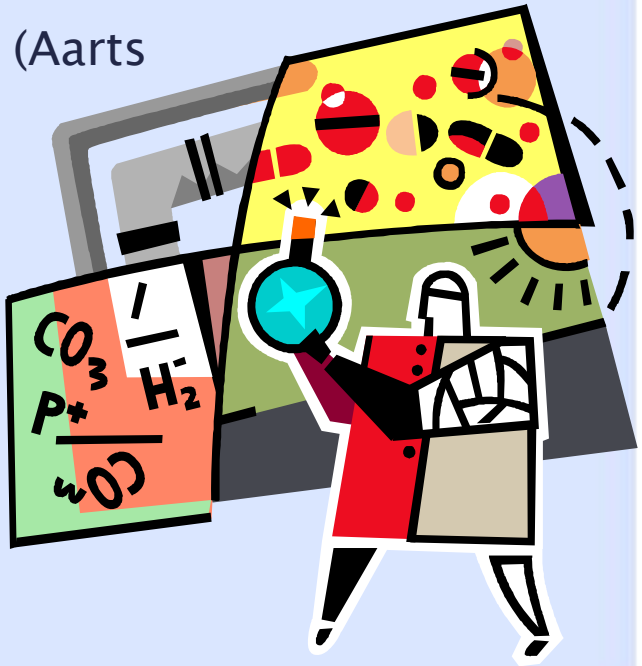
*Chaudhry et al (2006) Annals of Internal Medicine 144, E12-22

The e-Health paradox

- Evidence about the adoption of e-Health is equivocal (Goldzweig et al., 2009)
- Market penetration of electronic ordering systems in leading OECD countries barely reaches 20% (Aarts & Koppel, 2009)
- Major barriers are clinical resistance, poor usability, incompatibility with existing systems (Garg et al. 2005)



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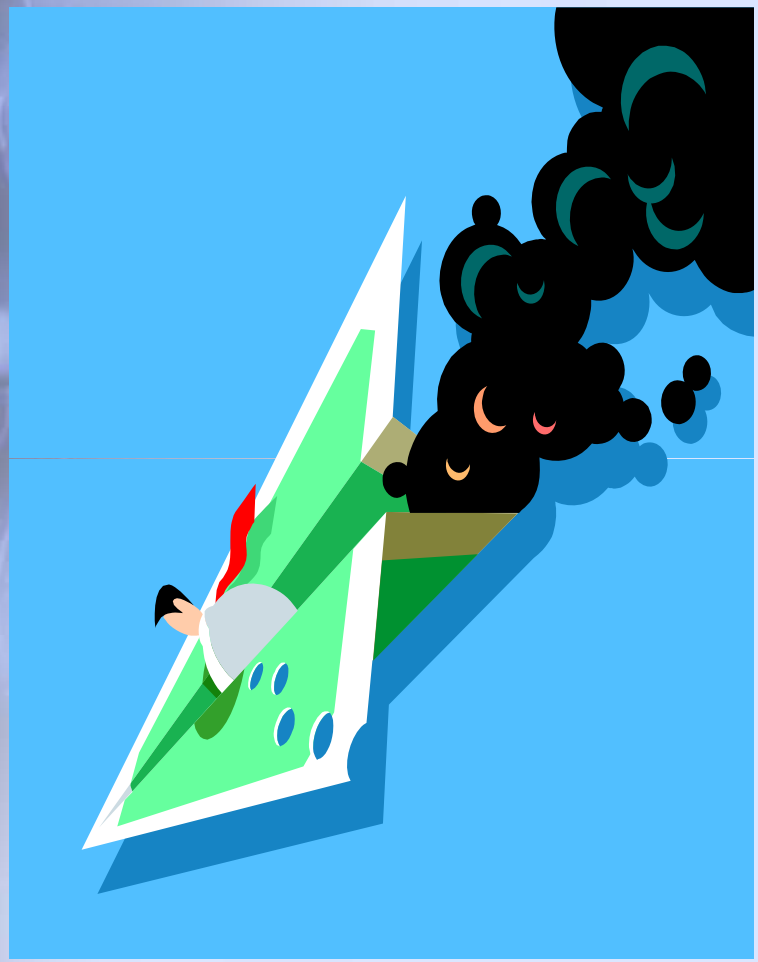
Dysfunctions, problems and errors



- Electronic systems as a source of potential error *(Koppel 2005)*
- Clinical resistance *(Berger 2004)*
- Unintended consequences *(Campbell et al. 2006)*

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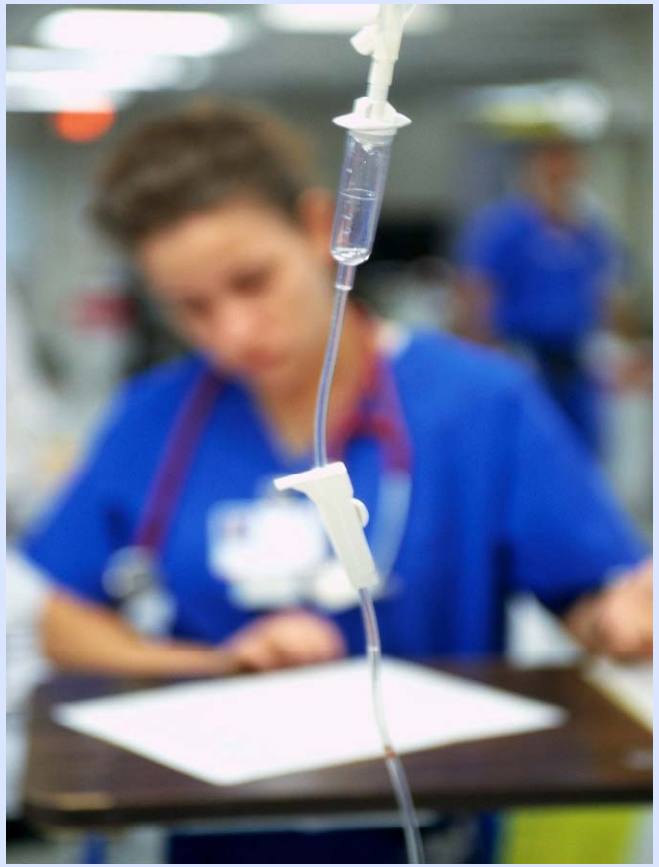
The complexity of clinical work

- ICT can disturb traditional patterns of organisation
- ICT is a disruptive technology
- It is not simply a technical roll out issue



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What works, for whom and in what circumstances?

- One size does not fit all
- Know your customer
- What are the circumstances?

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Agency for Healthcare Research and Quality*

"…Clinical Decision Support should not be viewed as a technology or as a substitute for the clinician, but as a complex intervention requiring careful consideration of its goals, how it is delivered, and who receives it."

*Berner ES AHRQ Publication No. 09-0069-EF (2009)

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NHS Connecting for Health Evaluation Programme*

"The hope of finding one overarching message regarding the effectiveness and safety of Clinical Decision Support Systems is naïve and should be abandoned. Rather, research should focus on understanding the contexts in which these decision support tools are most likely to prove effective and this should be a priority for … new eHealth applications with built-in decision support functionality."

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**Car et al. The impact of eHealth on the Quality and Safety of Healthcare 2008*

Thank you

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