Managing the challenges of translational research?

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Bridging the gap

Enormous gap between what we know can optimise health and healthcare and what actually gets used and implemented in every day practice.
The research continuum

Challenge Number 1: Reducing the time from discovery to practice
Evidence into practice: a long journey

- 1593 - Sir Richard Hawkins — scurvy treatment
  - "That which I have seen most fruitfull for this sicknesse, is sower [sour] oranges and lemons."

- 1601 - Captain James Lancaster shows that lemon juice supplement eliminates scurvy among sailors (non-randomized controlled trial)
Translating Scurvy Evidence into Practice: A 194 year journey....

- 146 years later - Lind shows that citrus juice supplement eliminates scurvy

- 1795-(194 years after Level 2 evidence) British Navy implements citrus juice supplement
150 years later...Marshall and Warren – *Helicobacter pylori*

- Discovery bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease.
- 1983- seminal Lancet publication
- 2000 - NICE guidance - Regimens to eradicate Helicobacter pylori
- 17 years to become standard best-practice

How many unnecessary gastrectomies and selective vagotomies have been undertaken?

Robin Warren, Department of Pathology, Royal Perth Hospital, Perth, Australia
Barry Marshall, Helicobacter pylori Research Laboratory, Queen Elizabeth II Medical Centre, Nedlands, Perth, Australia.
Can we afford to wait this long?
Challenge Number 2:

Premature translation vs. Lost in translation
Dichotomy – too early or too late

Premature Translation

“Genomics and Personalized Health”
Predictive, Preventive & Personalized Medicine

“I predict that comprehensive, genomics-based health care will become the norm with individualized preventive medicine and early detection of illnesses” (Zerhouni, 2006)

“Let’s be realistic: If we didn't do it with aspirin, how can we expect to do it with DNA?”

“Lost in Translation”

< 33% of patients with coronary artery disease are prescribed aspirin

C. Lenfant NEJM 2003;349:868
Applying the knowledge we have

“The application of what we know already will have a bigger impact on health and disease than any drug or technology likely to be introduced in the next decade.”

J A Muir Gray, Director of Clinical Knowledge, Process and Safety - Connecting for Health, NHS
Challenge Number 3:

Integrating dissemination and implementation science into the research design
# Quality in Acute Stroke Care

## Background

- 48,000 stokes/year
- High burden of disability and death
- 50% of patients post stroke experience fever & hyperglycaemia – brain tissue adversely affected
- 75% difficulty swallowing - pneumonia

## Intervention

- Implemented evidence based management of swallowing, fever and hyperglycaemia
- 19 NSW Stoke Units
  - intervention (n=10)
  - control (n=9)
- 2005-2011
  - 6 years
Quality in Stroke Care Study

Results

- 16% reduction in death and dependency for stroke patients due to teamwork and good nursing care from this cluster randomised controlled trial’
- Fast tracked Lancet Publication
- Work in the top 2% of published articles in biology and medicine
- ‘unique design...well conducted...findings should be taken very seriously’ ACP Journal Club 2012.

Implementation of evidence-based treatment protocols to manage fever, hyperglycaemia, and swallowing dysfunction in acute stroke (QASC): a cluster randomised controlled trial

Prof Sandy Middleton, PhD\textsuperscript{a, b}, Patrick McElduff, PhD\textsuperscript{c}, Prof Jeanette Ward, PhD\textsuperscript{f}, Prof Jeremy M Grimshaw, PhD\textsuperscript{g}, Simeon Dale, BAHons\textsuperscript{a, b}, Prof Catherine D’Este, PhD\textsuperscript{d}, Peta Drury, MN\textsuperscript{a, b}, Prof Rhonda Griffiths, PhD\textsuperscript{h}, N Wah Cheung, PhD\textsuperscript{i}, Clare Quinn, MSc\textsuperscript{j}, Malcolm Evans, MN\textsuperscript{e}, Dominique Cadilhac, PhD\textsuperscript{k, l, m}, Prof Christopher Levi, PhD\textsuperscript{c, e}, on behalf of the QASC Trialists Group
Challenge Number 4:

Securing funding
Traditionally not a funding priority

- 60% of NIH budget allocated to basic research
- 30% NIH budget spent on clinical research
- 10% NIH budget allocated to other research, including translational research
Is it cost effective?

- A major obstacle to the translation of the basic scientific discoveries to human studies; and new knowledge into everyday clinical practice and decision making, is determining whether the new approach is cost effective for widespread adoption.

- Integrating economic analysis into the research design
Challenge Number 5:

Keeping up with an evolving science
An evolving science

- **Knowledge translation research** – evidence practice gap

- **Dissemination and implementation research** *(Implementation Science)* seeks to address this gap by understanding how to best ensure that evidence-based strategies to improve health and prevent disease are effectively delivered in clinical and public health practice.

- **Program research** – Big Picture, Focus on Public Health Population and Policy. Systematic application of theoretical and empirical scientific knowledge to improve the design, implementation and evaluation of public health programs.
Challenge Number 6:

Balancing the need for a robust research design with practicalities
Implementation ‘Science’

What outcome gap(s) are we looking at?

What is the evidence to support practice change?

What are the barriers and enablers to change?

What intervention is most suitable to apply at this time?

How will we evaluate its impact?
Methods

Pre-post test quasi-experimental study design

- **Survey**: pain assessment capabilities
- **Chart audit**: pain assessment practices
- **Impact**: Patient reported pain outcomes
Intervention: Spaced Education

Built around two evidence-based theories:

• The testing effect
• The spacing effect
The lived experience

- Governance approval for five sites – took 6 months
  - Ethics Approvals – 4 months
  - Site Specific Approvals – 6 months
  - Clinical Trials Agreements – 3 months

- IT issues
  - Piloted – worked well
    - Firewalls changed !!!!

- Research design vs. ethical issues
  - Audit and feedback –
    - protecting underperforming staff!!!
Summary

1. Reducing the time from discovery to practice
2. Premature translation vs. lost in translation
3. Integrating dissemination and implementation science into research
4. Securing funding
5. Keeping up with an evolving science
6. Balancing the need for a robust research design with practicalities
Focus on priority areas

Need to prevent and minimise:

- Errors and mistakes
- Poor quality healthcare
- Waste
- Variations in policy and practice
- Poor patient experience
- Overenthusiastic adoption of interventions of low value
- Failure to get new evidence into practice
Thank you

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