Embedded Pragmatic Clinical Trials: triumphs and tribulations

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Agenda

1. Methods
2. The problem
3. Embedded PCTs
4. Experiences
5. If they are so great, why aren’t they used more?
6. Some policy recommendations
Methods

1. Literature review
2. Program theory and economic analysis
3. 30+ interviews, 6 site visits
4. KP, VA, Intermountain, HCA, PAMFRI, Group Health
5. Participation in meetings
   - NIH Collaboratory, embedded PCT projects at Harvard Pilgrim
Evidence generation fails: RCTs have high internal validity, but...

- Expensive: 20 – 40 000/patient
- Difficult
- Lacking in generalisability

<< 50% of treatments supported by evidence*

* Source: IOM 2012
Embedded PCTs
Definition embedded pragmatic RCT

- Randomized (cluster or individual)
- Pragmatic design (population, comparator, setting etc)
- Data from existing (electronic) sources
Re-think clinical trials: REDUCE-MRSA

- 43 hospitals
- 75,000 patients
- EHR + admin data
- $40 per patient
Experiences with embedded PCTs
Experiences with embedded PCTs

• Important work ongoing
  – NIH, PCORI, FDA, Sweden, UK
• Growing literature
Results literature review
Literature review of embedded PCTs

• 2006 – 2016, English
• Search + snowballing + contacting authors resulted in 105 studies
• Extracted information on:
  – Where and how
  – Costs
  – Methodological choices
Used in many settings

Large integrated systems >30%

Chart Title

Preliminary results – do not cite
Used in many diseases

Preliminary results – do not cite
Used in many types of interventions

<table>
<thead>
<tr>
<th>Intervention level</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Population</td>
<td><strong>Screening prompts</strong></td>
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<td>Patient</td>
<td>Comparative effectiveness of treatments</td>
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<td>Physician</td>
<td><strong>Decision support</strong></td>
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<td>Organisation</td>
<td>Task shifting</td>
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</table>
Large and inexpensive

Randomized patients
- Median 4,900
- Max 1,000,000

Median total cost* = $725,000
Median cost per patient = $96
- 40% < $50 per patient
- 15% > $1500

*Source: Grants or information from author
Costs

(Secondary) endpoints not in existing data
Cluster randomization
Behavioral health
NIH-funded
Comparative effectiveness

Preliminary results – do not cite

Registry
Education and information
Individual randomization
Some methodological choices

- PROs: 10%
- Costs: 22%
- Cluster randomized: 75%
- Informed consent waived: 85% (of CRT)
- Data from EMR: 55%
- Stepped-wedge: 8%

More common

Less common
Results interviews and analysis
If they are so great, why aren’t there more embedded PCTs?

Key success factors
- Bandwidth, IT, QI structures

Opportunities
- Improved health IT
- Value based health care

Challenges
- Data
- Interaction w/ delivery system
- Public good

Threats
- Research governance
- Misaligned, fragmented system

Positive

Negative

Internal

External

Preliminary results – do not cite
Threats          Policy recommendations

Research governance

- IRB
- Informed consent
- Manage risks
Weaknesses

Interaction with delivery systems

Policy recommendations

• Partnerships
• Incentive structure
  • Research community
  • Provider organizations
• Systematic approach
  • methods
  • prioritization