What works to reduce low value care?

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Lessons learnt: adult literature (Levitt BMJ 2016)

- Multi-faceted more effective than single interventions

- Need to understand (and then address) unique drivers of low value care for all end-users ie clinicians & patients—don’t assume it’s all due to lack of knowledge!

- Communication between doctor and patient is key
  - GOR vs GORDisease

- Sustainability a challenge eg clinician education vs. systems based intervention
Lessons learnt: variation in paediatric care

2014 Review for NSW Government

- 16 common conditions
- Inpatient, OP and ED settings
- Most data from North America > UK > Aus
- Variation in care common
- Less variation in effective care associated with:
  - setting ie children’s vs generalist hospitals
  - clinicians ie hospitalists vs non-hospitalists
  - age of clinician ie younger clinicians perhaps more likely to be aware of and adhere to clinical practice guidelines; and;
  - computer-based electronic order set/clinical decision support, at point of care.


10 Commandments for Effective Clinical Decision Support in Imaging (Khorasani et al Am J Radiol 2014)

1. Should be part of a multi-disciplinary QI program
2. Strength of evidence behind it must be transparent
3. Sources of evidence must be diverse and vetted locally
4. Evidence must be current (? RACP role for repository of EVOLVE evidence)
5. Must be brief, unambiguous, and actionable
6. Respect ordering clinician workflow
7. Consequences for ignoring recommendations eg clinician audit & feedback, peer-to-peer consultation to override CDS
8. Target well defined clinical gaps
9. Must be able to measure impact (clinical data + test)
10. Position to improve patient and clinician workflow eg access to MRI schedules at point of MRI request
Low Value Care Systematic Review

**Review Question**: Which interventions work to reduce clinician ordering of unnecessary imaging and/or pathology tests in children?

**Aims**:

- describe and examine the comparative effectiveness of various interventions;
- examine the cost-effectiveness of interventions (as reported);
- examine any wider costs/benefits of the interventions (eg. effects on LOS, admissions, cost reductions etc.)
Low Value Care Systematic Review

Registered with Prospero: CRD42016047960

PROSPERO International prospective register of systematic reviews

Effectiveness of interventions aiming to reduce unnecessary imaging and pathology tests in paediatric populations: a systematic review

Harriet Hiscock, Rachel Neely, Jason Soon, Andrew Georgiou

Citation

Review question(s)
This systematic review is designed to examine the effectiveness of various interventions and associated implementation strategies aimed at reducing unnecessary imaging and pathology tests in paediatric populations. ‘Unnecessary tests’ are, for example, radiography, CT scan, MRI or routine bloods that are conducted without clinical indication to do so.
Search Strategy

- **Systematic search**: MEDLINE, EMBASE, CINAHL and Cochrane Library
  - **Dates**: 01/01/1996 - 29/08/2016
  - **Exclusions**: non-English language, adult population, non-intervention, N=1 case reports, or studies with no control group.

- **Grey literature**: eg. Google Scholar; white papers; health services conference abstracts; College’s reports (eg. RACP); Choosing Wisely; EVOLVE; and hand searching of reference lists.
Records identified through database searching (n = 7,854)

Additional records identified through other sources (n = TBD)

Records after duplicates removed (n = 5,581)

Records screened (n = 5,581)

Records excluded on title & abstract (n = 5,427)

Full-text articles assessed for eligibility (n = 154)

Full-text articles excluded:
- non-English: (n = 6)
- not paediatric (n = 29)
- intervention details (n = 25)
- Pending mean age (n = 9)

Studies included in qualitative synthesis (n = 85)
Early thoughts on types of interventions:

- **Mostly**: system-based eg. electronic clinical decision support or computer order entry/procedural changes.
- **Mostly**: education eg. lectures, webinars, guideline distribution.
- **Many**: guideline publication externally eg. AAP guidelines.
- **Some**: audit and feedback eg. clinician or organisation performance is compared to peers.
- **Few**: family and patient education as part of a multi-faceted intervention.
- **None (so far)**: incentive or penalty schemes eg. reward or punishment for certain ordering practices.
Novel approaches

• Offer alternatives ie “do do” not just “do not do”
• Could we develop family practice guidelines to compliment our clinical practice guidelines?
• Carefully crafted language (develop with parents)
  “Chest x-rays can cause harm to children through radiation. Having a chest x-ray is not going to change what we do today for your child. The best thing to do is…..”
Don’t forget the simple stuff! Antibiotic Guideline Card

<table>
<thead>
<tr>
<th>Condition</th>
<th>Initial Antibiotics</th>
<th>Maximum Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonsillitis</td>
<td>Amoxicillin (150 mg/kg)</td>
<td>1000 mg daily</td>
</tr>
<tr>
<td>Otitis media</td>
<td>Amoxicillin (75 mg/kg)</td>
<td>500 mg daily</td>
</tr>
<tr>
<td>Parotitis</td>
<td>Clindamycin (600 mg)</td>
<td>1200 mg daily</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>Amoxicillin (150 mg/kg)</td>
<td>750 mg daily</td>
</tr>
<tr>
<td>Meningitis</td>
<td>Ceftriaxone (1 g)</td>
<td>2 g daily</td>
</tr>
<tr>
<td>Streptococcal Cellulitis</td>
<td>Penicillin (10 million units)</td>
<td>500 mg daily</td>
</tr>
</tbody>
</table>

Adapted from: Mike South, RCH

Courtesy of Prof Mike South, RCH
<table>
<thead>
<tr>
<th>CONDITIONS ON CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningitis</td>
</tr>
<tr>
<td>Hib prophylaxis</td>
</tr>
<tr>
<td>N.meningitidis prophylaxis</td>
</tr>
<tr>
<td>HSV encephalitis</td>
</tr>
<tr>
<td>Periorbital cellulitis</td>
</tr>
<tr>
<td>Orbital cellulitis</td>
</tr>
<tr>
<td>Endocarditis prophylax</td>
</tr>
<tr>
<td>Acute peritonitis</td>
</tr>
<tr>
<td>Ascending cholangitis</td>
</tr>
<tr>
<td>Giardiasis</td>
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<tr>
<td>Urinary tract infection</td>
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</table>
Evaluation

6 months before cards issued
6 months after cards issued
staff not informed of study

“you might find this useful”
Choice of antibiotic - Pneumonia

P<0.001
Dose of antibiotic - Pneumonia

- 81%
- 48%

$p = 0.001$
Use of 3rd Generation Cephalosporins

Cost Effective
Background
Asthma is among one of the top 5 diagnoses in children admitted to hospital.
Chest X-rays are often ordered with limited benefit.
Average cost of CXR = $370 US / Australia ~$50
Exposure to radiation (80-100 μGY)
High prevalence of asthma in Australia (2 million children aged 5-14 years)
Australian study - Central coast
Methods
Defined when CXR was unnecessary
- known asthmatic
- Diagnosis of asthma
- Good response to treatment
- No suspicion of pneumothorax
- Not ICU

Before after retrospective ICD codes of asthma

Educational intervention
All medical and nursing staff involved in the care of children ED and wards
Presentations and posters

Ask Yourself
Is a CXR Necessary in Children?

NOT IF:
Your patient is a known asthmatic

AND
Your diagnosis is asthma

AND
Your patient is responding* to asthma therapy

*A reduced need for nebulisers/spacers over 3 hours given appropriate aggressive therapy on arrival
Table 2  Breakdown of the number of asthma presentations meeting each of the successive criteria for an unnecessary CXR. 6 Months before represents the same calendar 6 Months as those in the 6 month period after the education

<table>
<thead>
<tr>
<th>Criteria</th>
<th>12 months before n</th>
<th>6 months before n</th>
<th>6 months after n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total presentations with asthma</td>
<td>466</td>
<td>230</td>
<td>197</td>
</tr>
<tr>
<td>Total asthma presentations with CXR</td>
<td>260</td>
<td>134</td>
<td>72</td>
</tr>
<tr>
<td>Of the above – known asthmatic</td>
<td>232</td>
<td>121</td>
<td>57</td>
</tr>
<tr>
<td>Of the above – diagnosis asthma</td>
<td>221</td>
<td>116</td>
<td>57</td>
</tr>
<tr>
<td>Of the above – improved</td>
<td>211</td>
<td>109</td>
<td>56</td>
</tr>
<tr>
<td>Total unnecessary CXRs</td>
<td>211</td>
<td>109</td>
<td>56</td>
</tr>
</tbody>
</table>

CXR, chest X-ray.

45.3% before vs. 28.4% after (ARR 16.9%, p<0.001)