Asking answerable clinical questions

The key to evidence-based decision making

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What Questions Arise?

• At least 1 question / consultation
• Most of Qs = unanswered!
• Most likely to ask another Dr. for answer
• Most could be answered from medical literature
• Treatment & Diagnosis

Smith, BMJ (1996)

The Problem

• “Drs don’t know what they don’t know!”
  (Williamson, 1989)
• “It ain’t what Drs don’t know...
  It’s what they know that ain’t so!”
  (Sackett, 1985)
• “Information Management now an essential skill for Drs”
  (Smith, 1996)
Usefulness of Medical Information (I)

Value I = \frac{Relevance I \times Validity I}{Work required to Access I}

(Shaughnessy, 1994)

Thus....

Best Information Sources:
- Provide
  - Relevant Information
  - Valid Information
- Accessed
  - Quickly
  - Minimal effort

Why Structure Questions?
- Ensure efficient Search Strategy
- Requires you to consider the Patient Populations from which evidence can be Generalised to your patient
- Defines your option for Intervention (or Exposures / Study Factors) for Comparison
- Defines the Important Outcomes (to you; your patient; & society)
- Defines the Most Valid Study Design
Why Structure Questions?
1. Focus scarce learning time on evidence that is directly relevant to our patients’ clinical needs
2. Focus scarce learning time on evidence that directly addresses our particular knowledge needs, or those of our learners
3. Suggest high-yield search strategies
4. Suggest the forms that useful answers might take

(Sackett et al. EBM, 2001)

Why Structure Questions?
5. Can help us to communicate clearly when referring a patient
6. Can help students to better understand the content of what we teach, while also modelling adaptive processes for lifelong learning.
7. When we answer our questions, our curiosity is reinforced, our cognitive resonance is restored, and we can become better, faster and happier as clinicians.

(Sackett et al. EBM, 2001)

Basic types of Questions
- Background
- Foreground
Background questions
- 2-part
- General
- Asked by learners
- Disorder focussed
- Verb + Object
  - what is?
  - how does?
- What is adjuvant chemotherapy? What are the structures in the TMJ?
- Stable answers – ask experts/textbooks

Causality
“EXPOSURE” → “DISEASE”

Causality
POPULATION → INTERVENTION → OUTCOME
(Disease Group) (Exposure or Study Factor) ('Disease')
Foreground questions
- 4 part
- Specific
- Asked by clinicians
- Clinical problem + Intervention / Exposure + Comparator + Outcome (PICO)
- Patient centred
  - asked by patients
  - important outcomes
- Evolving – need up to date research data

Types of foreground questions
- Patient-centred
  - What is wrong with me? (diagnosis)
  - Why am I sick? (aetiology)
  - Where am I going to end up? (prognosis)
  - How should I be treated? (treatment)
- Specific

Anatomy of Question
P = Population (Among)
I = Intervention (Does)
C = Comparator (Vs)
O = Outcome (Affect)
S.D. = Optimal Study Design (S.D)
Four essential components

1. The **patient** and/or problem that is addressed: How do I describe a patient group similar to mine?
2. The main **intervention** or exposure considered: Which treatment, diagnostic test, prognosis-factor or exposure am I contemplating?
3. **Comparable** intervention, if relevant: Which main alternative can be used for comparison with the intervention?
4. The clinical **outcome(s)** of interest: What do I hope to achieve, measure, improve or influence?

Types of Clinical Qs

<table>
<thead>
<tr>
<th>Content</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>student</td>
</tr>
<tr>
<td>Pathology</td>
<td>jmo</td>
</tr>
<tr>
<td>Physiology</td>
<td>registrar</td>
</tr>
<tr>
<td>Physiology</td>
<td>consultant</td>
</tr>
</tbody>
</table>

Foreground Qs - med js
“dated” info

Background Qs - textbooks
not “dated” info

Where do clinical questions arise from?
1. Clinical findings - Gather and interpret findings
2. Etiology - Identify causes for disease
3. Differential diagnosis - Causes of patients’ problem
4. Diagnostic tests - Select and interpret diagnostic tests
5. Prognosis - estimate clinical course and complications
6. Therapy - treatments that do more good than harm
7. Prevention - reduce the chance of disease
8. Self-improvement - keep up to date, improve skills
A clinical question ‘map’

<table>
<thead>
<tr>
<th>Question type</th>
<th>Clinical problem</th>
<th>Intervention/ exposure</th>
<th>Comparator</th>
<th>Outcome(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aetiology</td>
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<td></td>
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<tr>
<td>Prognosis</td>
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<tr>
<td>Treatment</td>
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</tbody>
</table>

‘Map’ Your Clinical Questions

- Suggest the form (study design) that answers take
- Help plan search strategies

Central clinical problems 1/4

1. Clinical findings:
How to properly gather the most relevant findings from the history and physical examination, and interpret these correctly?

2. Etiology:
How to identify causes for disease (including its iatrogenic forms)?
3. Differential diagnosis:
When considering the possible causes of a patient's clinical problem, how to rank them by likelihood, seriousness and treatability?

4. Diagnostic tests
How to select and interpret diagnostic tests, to confirm or exclude a diagnosis, based on consideration of precision, accuracy, acceptability, expense, safety, etc?

5. Prognosis:
How to estimate the patient's likely clinical course over time and anticipate likely complications?

6. Therapy:
How to select treatments to offer patients that do no more good than harm and that are worth the efforts and costs of using them?

7. Prevention:
How to reduce the chance of disease by identifying and modifying risk factors and how do we diagnoses disease early by screening?

8. Self-improvement:
How to keep up to date, improve our clinical skills and run a better, more efficient clinical practice?
Why ‘Map’ the questions?

- Suggest the form (study design) that answers take
- Help plan search strategies

<table>
<thead>
<tr>
<th>Question</th>
<th>Study type</th>
<th>Database</th>
<th>Best one-line search term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>Cross-sectional analytic</td>
<td>Medline</td>
<td>Sensitivity.tw</td>
</tr>
<tr>
<td>Aetiology</td>
<td>Cohort, case-control</td>
<td>Medline</td>
<td>Risk.tw</td>
</tr>
<tr>
<td>Prognosis</td>
<td>Cohort</td>
<td>Medline</td>
<td>Exp cohort studies</td>
</tr>
<tr>
<td>Intervention</td>
<td>Meta- analysis, RCT’s</td>
<td>Cochrane</td>
<td>Meta analysis.pt or clinical trial.pt</td>
</tr>
</tbody>
</table>

Example

Therapy

Tooth coloured materials are acceptable alternatives for amalgam.
Example: Problem / hypothesis

“Tooth coloured materials are acceptable alternatives for amalgam in the posterior teeth”

What is being discussed?

• Caries / Replacement?
  • primary/secondary?
  • large/small?
  • proximal / gingival / occlusal?
• Intraoral location:
  • premolars / molars?
• Patient:
  • adults/children
  » deciduous/permanent?

“Tooth coloured materials”

• Composite resin (macrofill, microfill, hybrid, “flowables”?)
• Composite resin with glassionomer addition?
• Composite resin, cemented inlay (clinic, laboratory?)
• Ceramic, cemented inlay (sintered, cast, ground?)
• Glassionomer (metal-reinforced, conventional?)
• Glassionomer with resin?
• “Polyglass”, “ceromer”, “crystal polymer”, “polymer ceramic”?
• Ormocer? - “The flowable ceramic”
• Doxadent? - “The ceramic restoration that can be formed directly in the tooth”
For adults with **large primary** caries cavities in the occlusal surface of molars is an acceptable alternative for amalgam

For adults with large primary caries cavities in the occlusal surface of molars is an acceptable alternative for amalgam

For adults with large primary caries cavities in the buccal surface of premolars is an acceptable alternative for amalgam

For adults with large primary caries cavities in the approximal surface of premolars is an acceptable alternative for amalgam

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For children......

xxx: Composite resin, Composite resin with glassionomer addition, Composite resin, cemented inlay, Ceramic, cemented inlay, Glassionomer, Glassionomer with resin, "Polyglass", "ceromer", "crystal polymer", "polymer ceramic", Ormocer, Doxadent

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Formulating good and clinically relevant questions

… that can be answered by searching the literature...

1. Needs to be directly relevant for the actual problem;
2. Must be formulated in a way that facilitates the search for precise answers;
3. Should focus on and precisely describe four essential components
Example: Problem / hypothesis

“Tooth coloured materials are acceptable alternatives for amalgam in the posterior teeth”

1. Patient or problem that is addressed?
2. Intervention considered?
3. Comparable intervention considered?
4. Outcome of interest

Tooth coloured materials are acceptable alternatives for amalgam in the posterior teeth.

For adults with small primary caries cavities in the approximal surface of premolars are (hybrid) composite resins acceptable alternatives for amalgam

What is meant by “acceptable”?
Patient criteria?
Tooth coloured materials are acceptable alternatives for amalgam in the posterior teeth. For adults with small primary caries cavities in the approximal surface of premolars are (hybrid) composite resins acceptable alternatives for amalgam.

For adults with small primary caries cavities in the approximal surface of premolars do (hybrid) composite resins show comparable longevity to amalgam.

1. Patient or problem that is addressed
2. Intervention considered
3. Comparable intervention considered
4. The clinical outcome of interest

What questions do we answer?

• Most urgent
• Most interesting
• Most feasible to answer
• Most likely to recur
• Most examinable

Take Home Messages

1. Recognise Background Vs Foreground Qs
2. Formulate Qs carefully to facilitate search
3. Use 4-part anatomy P + I (c) + O
4. "Map" type Q
5. Include optimal Study Type in search strategy
Suggested Reading