

Asking answerable clinical questions

The key to evidence-based decision making

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What Questions Arise?

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

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)

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Usefulness of Medical Information (I)

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

(Shaughnessy, 1994)

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Thus....

Best Information Sources:

- Provide
 - Relevant Information
 - Valid Information
- Accessed
 - Quickly
 - Minimal effort

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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**

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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)

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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) ⁸

Basic types of Questions

- Background
- Foreground

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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

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Causality

“EXPOSURE” $\xrightarrow{?}$ “DISEASE”

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Causality

POPULATION \longrightarrow INTERVENTION \longrightarrow OUTCOME
(Disease Group) (Exposure or Study Factor) ('Disease')

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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

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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

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Anatomy of Question

- P = Population (Among)
- I = Intervention (Does)
- C = Comparator (Vs)
- O = Outcome (Affect)
- S.D. = Optimal Study Design (S.D)

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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?

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Types of Clinical Qs

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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

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A clinical question 'map'

Question type	Clinical problem	Intervention/ exposure	Comparator	Outcome (s)
Diagnosis				
Aetiology				
Prognosis				
Treatment				

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'Map' Your Clinical Questions

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

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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) ?



Central clinical problems 2/4

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?



Central clinical problems 3/4

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 more good than harm and that are worth the efforts and costs of using them?



Central clinical problems 4/4

7. Prevention:

How to reduce the chance of disease by identifying and modifying risk factors and how do we diagnose 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?

	NO	NO	NO	NO	NO	YES	YES	YES
Oxyfresh								
Lidocaine								
Sequester								
Act								
Clear Choice								
Plan								
Clear H								
Vitaldent								
Fluoroguard								
Laminate								
Empress								
Porcelain								

Why 'Map' the questions?

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

Question	Population	Intervention/ exposure +/- comparison	Outcome	Study type	Database	Best one-line search term
Diagnosis				Cross sectional analytic	Medline	Sensitivity.tw
Aetiology				Cohort, case- control	Medline	Risk.tw
Prognosis				Cohort	Medline	Exp cohort studies/
Intervention				Meta- analysis, RCTs	Cochrane Library, Medline	Meta analysis.pt or clinical trial.pt

Example

Therapy

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Tooth coloured materials are acceptable alternatives for amalgam.



Example: Problem / hypothesis

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

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What is being discussed?

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

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"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, grinded?)
- 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"

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

For adults with large primary caries cavities in the occlusal surface of molars is xxxxxx an acceptable alternative for amalgam
For adults with small primary caries cavities in the occlusal surface of molars is xxxxxx an acceptable alternative for amalgam
For adults with large secondary caries cavities in the occlusal surface of molars is xxxxxx an acceptable alternative for amalgam
For adults with small secondary caries cavities in the occlusal surface of molars is xxxxxx an acceptable alternative for amalgam
For adults with large primary caries cavities in the buccal surface of molars is xxxxxx an acceptable alternative for amalgam
For adults with small primary caries cavities in the buccal surface of molars is xxxxxx an acceptable alternative for amalgam
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For adults with small secondary caries cavities in the approximal surface of premolars is xxxxxx an acceptable alternative for amalgam
For children:.....

xxxxx: 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

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

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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

- 1. Patient or problem that is addressed
- 2. Intervention considered
- 3. Comparable intervention considered

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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?

Dentist criteria? / caries? / longevity? / fracture risk? / prognosis? / etc.

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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 37

What questions do we answer?



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

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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

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Suggested Reading

1. "Asking answerable clinical questions" In: Evidence- Based Medicine: How to Practice and Teach EBM. Sackett DL. et al (eds) 2nd ed. Churchill Livingstone, Edinburgh (2000) pp 13-27
2. "Tracking down the evidence to solve clinical problems" In: Clinical Epidemiology: A Basic Science for Clinical Medicine. Sackett DL et al (eds) 2nd ed. Little, Brown & Co Boston (1991) pp 335-358
3. Smith R. "Information in Practice: What clinical information do doctors need?" BMJ (1996) 313; 1062-1068
4. Ely, JW, et al "Obstacles to answering doctors' questions about patient care with evidence: qualitative study" BMJ (2002) 324; 710
5. Richardson W Wilson M, Nishikawa J, Hayward RS. The well-built clinical question: a key to evidence-based decisions [editorial]. ACP Journal Club 1995; 123:A12-3.

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