Diagnosis and overdiagnosis in the medical curriculum

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Introduction

- Overdiagnosis is a complex concept where an asymptomatic patient is diagnosed with a condition that will not impact management or lead to premature death (1). It interlinks with overinvestigation and overtreatment under the banner of 'too much medicine' and is a key feature of low-value patient care (1). Several drivers contribute to overdiagnosis in the clinical setting relating to emotional factors and lack of education or experience, amongst others (2). For overdiagnosis to be prevented in clinical practice, the diagnostic framework must be understood (3, 4).

- The concepts of overinvestigation, overdiagnosis, and overtreatment are particularly relevant to medical education as they can be mapped to clinical and diagnostic reasoning curricula (5, 6).

Methods

- Western Sydney University students, conducting individual research projects for the Doctor of Medicine program, participated as co-investigators and co-designers in a program of research and curriculum review to ensure that overdiagnosis is understood alongside developing skills in diagnosis. Using the design-based research model, we incorporated the following methodology:

1. Narrative literature review

2. Medical student interviews using a semi-structured interview protocol. Questions encouraged students to describe their preclinical and clinical learning of 'diagnosis', how they approach patient workup, and what final-year medical students knew about 'too much medicine'.

3. Curriculum mapping and faculty interviews, using the competencies proposed by Pathirana et al. (7) as a benchmark, to detect gaps within the curriculum.

4. Development of learning activities (integrated and extracurricular) to address the gaps identified.

Results & Discussion

Literature Review

- Existing literature on the diagnostic framework in medicine view it as a non-linear process that typically starts with patient engagement, followed by data gathering in the form of a history and examination, the generation of differentials, a decision to investigate or test further, and integration of all the data and analysis to make a diagnosis.

- These 'too much medicine' concepts can be visually mapped to specific stages or thresholds in the clinical and diagnostic reasoning framework as shown in Figure 1.

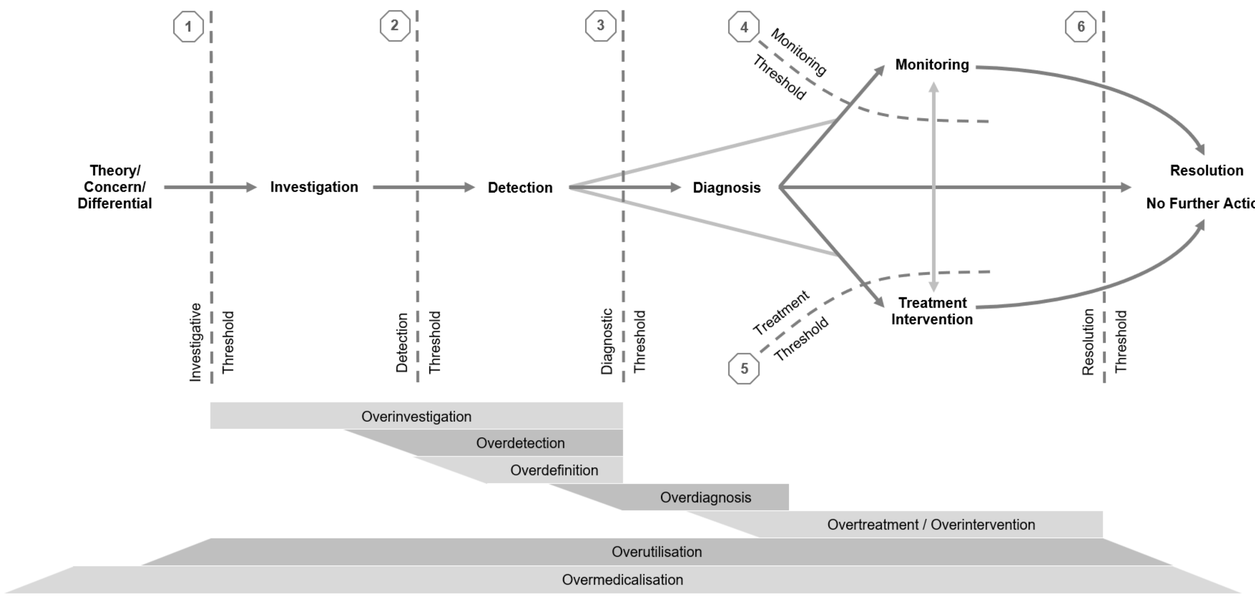
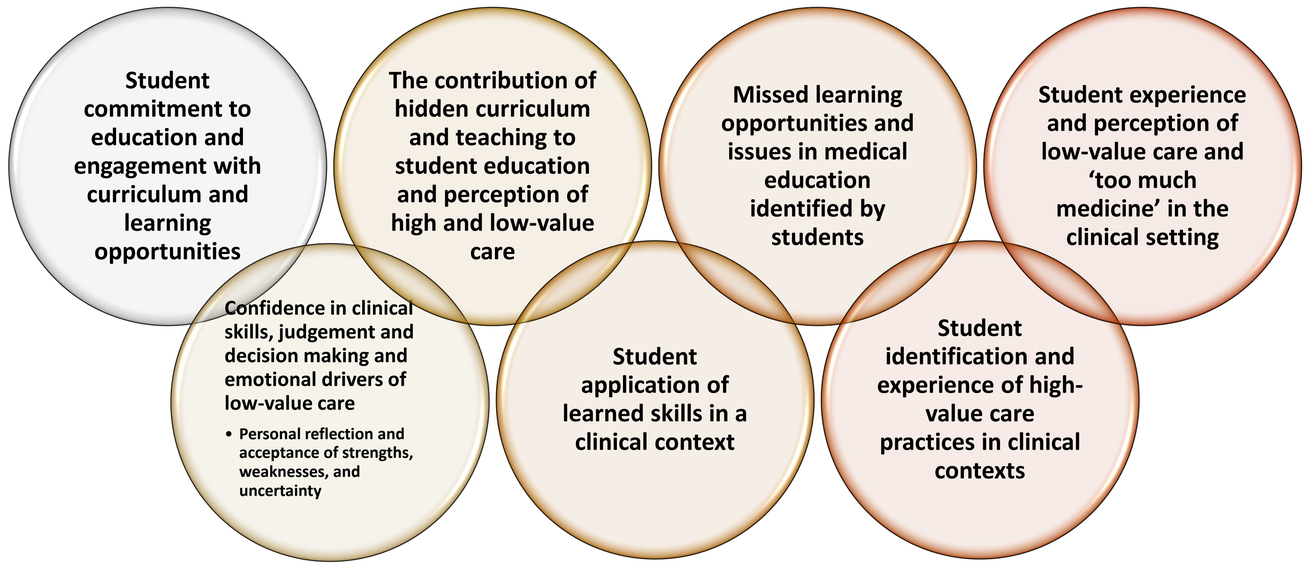


Figure 1 – 'Too much medicine' and the clinical and diagnostic reasoning framework

Student interviews

Study 1 – year 3-5 student interviews

Seven themes and one subtheme emerged regarding the student experience of medical education and their perceptions of high and low-value care:



Study 2 – year 5 student interviews

Four themes conveying 3 scopes (Knowledge of 'too much medicine', Cognitive processes potentiating 'too much medicine' and, Expressly articulated drivers of 'too much medicine'.

Informal learning is key to existing 'too much medicine' knowledge base

Limited development of deliberative reasoning underpinning 'too much medicine' processes

'Too much medicine' to deal with uncertainty and provide reassurance

'Too much medicine' as a by-product of systems

Curriculum Mapping

Competency	Curriculum
Understand overdiagnosis – what it is and what it is not.	Not explicit
Understand consequences of overdiagnosis	Year 2&3 in population health – cancer screening, and in geriatrics
Identify potential solutions for preventing overdiagnosis	Not explicit
Communicate about overdiagnosis	Year 2 - oncology
Understand the role of shared decision making in prevention of overdiagnosis	Year 5 in General Practice – managing uncertainty
Understand the drivers of overdiagnosis	Not explicit
Applying evidence for diagnostic testing	Year 2&3 in population health – cancer screening

Proposed educational framework

1. An initial **workshop** to enhance awareness and understanding of medical students on the concept of overdiagnosis through a structured and well-organised interactive session. The aim of this workshop is to address and highlight the following issues:
   - Lack of confidence/Presence of uncertainty among medical students
   - Students being pressured to deliver a definite diagnosis
   - Lack of knowledge on application of evidence to patient care

2. **Case-based learning** sessions tackling diagnosis and the potential for/repercussions of overdiagnosis, misdiagnosis, delayed diagnosis.

3. **Integrating** this concept throughout the curriculum where possible, and encouraging students to consider the determinants of overdiagnosis or misdiagnosis, the consequences of overdiagnosis, and potential solutions and methods of avoiding overdiagnosis (e.g. method of clearing uncertainties).

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