Table 1. Knowledge, skills and behaviours in the different domains of clinical reasoning

Key component	*Areas of knowledge, skills and behaviours*
Clinical reasoning concepts	Demonstrate an understanding of: • Clinical reasoning theories (e.g. script, dual process) • How clinical reasoning ability develops • The role of clinical reasoning in safe and effective care for patients • Cognitive errors • Other factors that may impair the clinical reasoning process/outcome
History and physical examination	Demonstrate the ability to use: • Effective communication skills and purposeful interviewing • History taking from all available sources when relevant • Hypothesis-driven enquiry • Knowledge of epidemiology, probability of the presence of signs and symptoms in specific diseases, and likelihood ratios to estimate clinical probability
Choosing and interpreting diagnostic tests	Demonstrate a practical understanding of and ability to use the following: • Pre-test (clinical) probability and post-test probability • Sensitivity and specificity • Predictive values • Factors other than disease that influence test results • Important characteristics of commonly used tests relevant to local context • Evidence-based guidelines
Problem identification and management	Demonstrate an ability to produce: • An accurate problem representation or problem list • Use of semantic qualifiers and precise medical terms • Prioritised differential diagnosis, including relevant 'must not miss' diagnoses • Safe actions when a diagnosis is not possible • Management plans taking patient's preferences, co-morbidities, resources, cost-effectiveness and local policies in to account • Metacognition and critical thinking in decision making
Shared decision making	Demonstrate the ability to make decisions with: • Patients and carers • Clinical teams • Guidelines, scores and decision aids • Evidence-based medicine applied to the patient's circumstances • Professional values and behaviours that support decision making

Table 2. Effective teaching strategies

Strategy	*Examples*
Strategies that build understanding	• Self-explanation (getting learners to make connections and elaborate by explaining their thinking and rationale) • Explaining the basic science mechanisms for symptoms and signs
Strategies that employ structured reflection	• Encouraging students to ask themselves questions like, 'What's the evidence for this? What else could it be?' • Asking students to list findings compatible or not compatible with each differential diagnosis
Practice with cases and corrective feedback	• Providing opportunities to practice with as many different cases as possible in as many different contexts as possible • Using a whole case approach for novices to reduce cognitive load (have all the information they need to solve the problem readily available throughout) • Ensuring coaching and feedback on the clinical reasoning process
Strategies that structure knowledge around problem-specific concepts	• Learning a diagnostic 'decision tree' in later years of medical school once fundamental concepts have been learned, underpinned by relevant basic science, clinical knowledge and evidence
Strategies that employ retrieval practice	• Activities that promote effortful recall of information during teaching activities rather than the teacher explaining information • Use of structured reflection while solving cases • Spaced practice (studying topics in shorter, spaced apart blocks rather than a single block and moving on) • Contrastive learning (getting learners to list features they would expect in one diagnosis compared with another)
Strategies that differ according to stage of learning	• Low complexity, low fidelity tasks with high instructional support in the early years moving to high complexity, high fidelity tasks with minimal instructional support by final year at medical school • Approaching graduation, opportunity to work as part of a clinical team in a 'real' supervised environment