

COLLABORATIVE DEVELOPMENT OF CONCEPT-BASED CASES FOR COGNITIVE INTEGRATION

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PURPOSE

The Aquifer Sciences curriculum¹ is a resource for development of tools to support cognitive integration². Six medical schools (see above) have developed concept-based virtual patient cases, each operationalizing a single Integrated Learning Objective (ILO), linked to an underlying core basic science concept. Cases are designed to provide clerkship students with deliberate practice in applying their basic science knowledge, with emphasis on transfer³ and safe and effective clinical decision-making⁴. Here we describe the structure of the concept-based cases and document initial efforts toward building a library of exemplar cases.

METHODS

- Pilot school teams: basic science educators, clinical science educators, and senior students
- For each ILO assigned, authors use the ILO's common condition to write a vignette, the ILO itself to write a clinical decision question, the teaching point to write a basic science justification question, and the harm statement to write an "entrusted action." Authors also write expert answers as feedback to learners.
- Assignments: after calibration round (all schools wrote cases from same ILO, concept, condition), schools were assigned ILOs to create 2 cases at a time in 3 rounds, each with multiple case reviewers.
- The concept-based case framework is outlined in the figure.

RESULTS

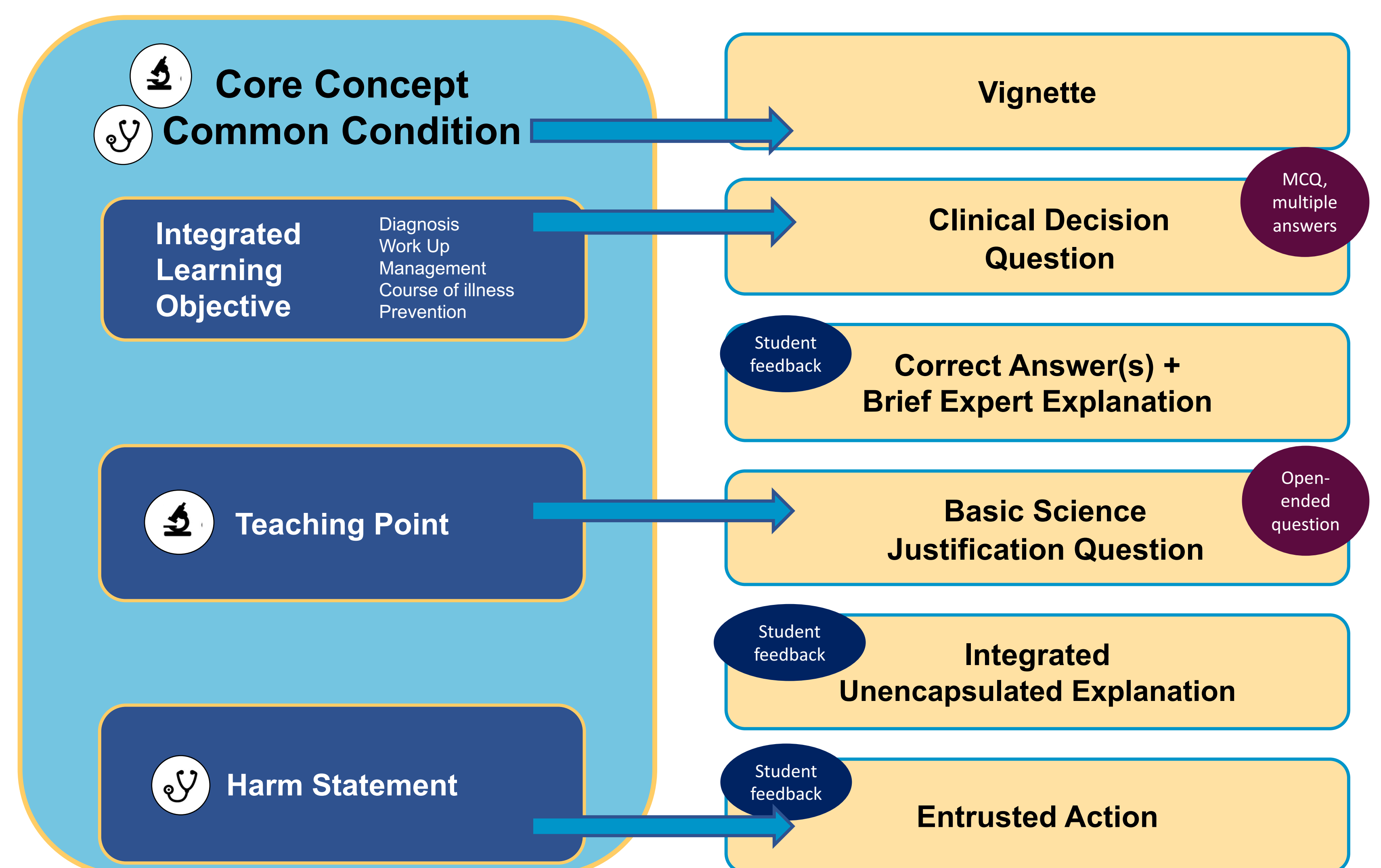
- ~38 concept-based virtual patient cases across a breadth of basic and clinical science disciplines are in development
- Cases developed are intentionally modular
 - 'Serial cases' support making multiple clinical decisions in the context of a single core condition
 - 'Transfer cases' support using knowledge of a single concept to make decisions in the context of unrelated clinical conditions.

REFERENCES

1. Aquifer Sciences curriculum database; <https://www.aquifersciences.org/>
2. Kulasegaram, K.M., et al (2017). Contexts, concepts, and cognition: principles for the transfer of basic science knowledge. *Medical Education*, 51, 184-195.
3. Kulasegaram, K.M., et al (2013). Cognition before curriculum: Rethinking the integration of basic science and clinical learning. *Academic Medicine*, 88(10), 1578-1585.
4. Moulton, CE, Regehr G, Mylopoulos M, and MacRae HM. Slowing down when you should: A New Model of Expert Judgment. *Acad Med*. 2007;82(10 Suppl):S109-S116.

Per case, pilot schools assigned an ILO with all linked components from Aquifer Sciences curricular database

Pilot schools author all of the following as part of a concept-based case:



CONCLUSION

Curricula that support learners' cognitive integration are challenging to design. Clinicians and basic science participants have valued the opportunity to collaborate on these cognitive integration tools. The cases developed here could be implemented to support cognitive integration and safe and effective decision making in curricula in a variety of ways.