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Design of a spiral curriculum to develop prescribing skills in undergraduate medical students

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Background

Jerome Bruner hypothesised that any subject can be taught in some form at any stage of development(1). Based on this hypothesis, spiral curricula revisit subject matter several times during a course(2). The complexity of a topic increases at each visit, allowing logical progression from simplistic to complicated ideas. New learning relates to old, allowing students to apply early knowledge to later objectives. Traditionally our students were taught: year 3, principles of clinical pharmacology; year 4, therapeutics; year 5, prescribing. Student feedback requested earlier prescribing training.

Summary of work and outcomes

We redesigned our curriculum using a spiral model, reassigning objectives for each topic by stage (e.g. table). Complexity increases in each topic at each iteration, with students building each year on knowledge and skills previously acquired. Students are supported in achieving objectives by year-specific prescribing skills sessions, lectures, online resources and prescribing textbooks(3,4). Learning is assessed by prescribing exam (year 5). Qualitatively, students appreciate the spiral format (e.g. year 3 student '*It's really good that we⋯ go through the process of prescribing⋯*', year 4 '*⋯.very useful at this point as we⋯ put⋯ skills into practice*') and find that '*working through cases is a good way to cement knowledge and concepts'*. In contrast to year 5 students (old curriculum) who felt that we should '*introduce prescribing scenarios earlier*', some year 3 ('*It is⋯ hard to try and take everything in at this point⋯ when⋯ we won't need to apply this until later years*') and year 4 ('*⋯less likely to be immediately critical and could be done later*') students felt prescribing was introduced too early.

Discussion

The spiral curriculum introduces prescribing early, giving students more time to develop and refine skills and providing relevant clinical context for clinical pharmacology/therapeutics learning. Potential downsides include displacement of theoretical teaching and student perception of irrelevance to learning stage. The prescribing performance of students undertaking the spiral curriculum has not yet been tested by examination.

Conclusion

Prescribing skills can be introduced to medical students during early clinical exposure, although relevance should be emphasised to encourage student engagement.

References

1. Bruner JS (1960). Harvard University Press

2. Johnston H (2012). http://eric.ed.gov/?id=ED538282

3. Hitchings *et al* (2014). http://www.elsevierhealth.co.uk/the-top-100-drugs-9780702055164.html

4. Baker *et al* (2014). http://eu.wiley.com/WileyCDA/WileyTitle/productCd-EHEP003099.html

Table. Example of spiral learning objectives

Year 3 Foundations of prescribing	Year 4 Prescribing in special circumstances	Year 5 Advanced prescribing
Students should be able to initiate prescriptions for:		
Oxygen	Bronchodilators	Corticosteroids
Simple analgesia	NSAIDS	Strong opioids
VTE prophylaxis		Anticoagulation
Crystalloid fluid infusion - single bag	Maintenance fluids	Fluid challenge, electrolyte disturbance
Oral antibiotics	Intravenous antibiotics	Intravenous-oral switch