Repeated Revision Tests to Prevent Knowledge Loss in Undergraduate Medical Students

Bachelor of Medicine and Bachelor of Surgery students of Melaka Manipal Medical College (Manipal Campus) undergo training in basic science subjects in a partially integrated curriculum. During their first year, they are taught anatomy, physiology, and biochemistry. The learning objectives of all three subjects are divided system wise and are taught in four block periods (blocks) of 10 wk each. At the end of each block, a progress examination is conducted by the concerned department, and the papers are evaluated by the faculty members of the department. The progress examination consists of two theory papers: paper I with brief essay-type questions of 60 marks and paper II with multiple true/false questions of 120 marks, which is scaled down to 30 marks. In addition, during the 10 wk of teaching of a block, there are three class tests that contribute 10 marks to make a total of 100 marks. The average of four progress examinations is calculated for internal assessment marks. The students go on vacation for about 4 wk on completion of the second progress examination. The university examination is conducted 3 wk after the completion of the fourth block progress examination by the university to which the college is affiliated, and the evaluation is done by the examiners (internal and external) appointed by the university.

A study conducted by D’Eon (1) revealed that medical students tend to forget the topics studied in the first year when they go to the second year. Similarly, in our medical college, we have noticed that the majority of the students forget the topics studied in the first semester by the time they complete the second semester and get prepared for the university examination. Most of the students feel that 70% of their study holidays (3 wk before the university examination) is spent on revising the topics learned during the first two blocks (first semester). Surprisingly, this is true even with the students who have scored high marks in their progress examinations. Therefore, as a remedial measure, we introduced “revision tests” during the second semester of the first year.

### Block 1
(week 1-10)

1. Basic concepts
2. Upper and Lower Extremities
3. General Embryology

### Block 2
(week 11-20)

4. Respiratory system
5. Heart and Thoracic Structures
6. Head and Neck

### Block 3
(week 25-35)

7. Abdomen and GI tract
8. Abdominal structures
9. Reproductive system

### Block 4
(week 36-46)

10. Endocrine and CNS
11. Cerebral vasculature
12. ANS and PNS

Repeated revision tests. These tests are conducted during the third and fourth blocks (second semester). In each block, three revision tests are given to the students with an interval of 3 wk between two revision tests. During the interval period of 3 wk between the revision tests, 6 h of revision classes are given. These tests usually include multiple true/false questions and, occasionally, short-answer questions or PowerPoint picture tests. Each test consists of 50% of questions from the earlier block that they revised and the other 50% from the current block that they are studying. By this, we make sure that the students do not neglect the topics of the current block. In addition, to make these tests more meaningful, the marks secured in the revision tests are added to block (progress) examination marks and constitute 20% of the total marks.

As far as anatomy is concerned, the topic distribution for the blocks is as follows:

- **Block 1**: basic concepts, upper and lower extremities, and general embryology.
- **Block 2**: the cardiovascular system and respiratory system.
- **Block 3**: the gastrointestinal tract, renal system, and reproductive system.
- **Block 4**: endocrine glands, the central nervous system, the peripheral nervous system, and special senses.

During the third block, the revision tests include the topics of block 1. Similarly, during the fourth block, the topics of block 2 are included. The details of the topics taught in the four blocks and the distribution of the topics in each of the revision tests conducted during blocks 3 and 4 are shown in Fig. 1.

A questionnaire was given to the students (n = 117), and their responses are shown in Table 1. It can be understood from Table 1 that the overall response of the students toward the revision tests was positive. Based on the student feedback, we assume that by introducing these revision tests we have succeeded in preventing knowledge loss in students to some extent. In addition, the students reported that “repeated revision tests” were an effective tool for improving the retention of
knowledge. The following quotes were obtained from student evaluations administered upon the completion of the first year:

- “Revision classes really helped, the tests made us study.”
- “Revision tests, classes pushed us to revise more often.”
- “Should be conducted in other subjects too.”
- “I hope other batches will also experience the benefit of the revision classes.”

To conclude, students found this system to be very useful, especially regarding the university examinations. Since they were made to study the earlier topics during the latter half of the academic year, they were able to utilize the university exam study holidays more effectively.

| Table 1. Responses of students to individual items of the questionnaire regarding revision classes and tests |
|-------------------------------------------------|----------------|----------------|----------------|----------------|
| Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
| Tend to forget first semester topics during the second semester | 54 | 57 | 3 | 3 |
| Revision tests helped to overcome loss of knowledge | 32 | 65 | 16 | 4 |
| Revision tests helped in preparation for university examinations | 43 | 50 | 17 | 6 |
| Revision classes played important role in regaining knowledge | 34 | 58 | 20 | 2 |
| Revision tests should be conducted in other subjects also | 43 | 45 | 10 | 12 |
| Overall, revision classes and tests were useful | 54 | 49 | 12 | 1 |

n = 117 student respondents.

REFERENCES

1. D’Eon MF. Knowledge loss of medical students on first year basic science courses at the University of Saskatchewan. BMC Med Educ 14: 5, 2006.

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