

Title: Basic sciences at the bedside: Evaluation of basic sciences recall in clinical teaching

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Context and Setting: The MBBS programme is a five year integrated curriculum. The preclinical Phases 1 and 2 of the curriculum is organised into a foundation block followed by the systems blocks. The clinical postings cover two and half years. An evaluation to determine the extent of basic science knowledge recalled for problem-solving and clinical reasoning in the final year, using written assessments and observing bedside teaching sessions was performed.

Why the Idea Was Necessary: Our program was designed to facilitate the student's development of integrated understanding of the relationship between basic biomedical and psychosocial scientific knowledge, analytical problem-solving, and clinical reasoning. However, many academic staff at the University of Malaya Medical Centre (UMMC) have commented that the medical students in the final year were unable to recall or apply basic science knowledge in problem-solving or clinical reasoning.

What Was Done: Students undertake clinical-pathological correlation studies (CPC) based on case reports either from The New England Journal of Medicine or cases written by the academic staff. Four to five students present and discuss the case with the whole class, facilitated by a lecturer. From March to August 2007, a written assessment on case presented, consisting of questions on physiology, pathology, pharmacology, microbiology and parasitology was carried out on eight cases. The questions were in the form of “one best answer” and “extended matching question” type.

The second part of the study consisted of recording questions on basic science recall by the teacher during bedside teaching sessions on the Pediatrics wards. The staff to student ratio was 1:6/8. Overall observations on the students' ability to recall were also noted. During these sessions, one long case clerked by a student was presented to the group and discussed, facilitated by the lecturer. One or two short cases selected “on the spot” were used for physical examination and discussed. The questions asked by the lecturer during the sessions were recorded and rated using Table 3 from New Mexico web document GOFAR (<http://hsc.unm.edu/som/ted>) (Resources – Table 3) on the category and level of basic science learning/thinking.

In order to determine the student's perception regarding their basic science knowledge in comparison to the results of the written assessment, information was also extracted from an end-of-course survey performed by the Faculty of Medicine's knowledge subcommittee on the previous year's batch (2005/06) of students.

Evaluation of Results/ Impact:

Summative Assessment on Student Recall: Number of questions per subject varied between 0 -5 questions depending on the case. The number of respondents varied from

36% to 75%, due to absentees or students who did not take the test. The recall rate for each subject varied from case to case (22% - 75%). The average recall for each of the subjects was 65.62% for physiology whilst microbiology (58.6%), pharmacology (53.4%) and pathology (55.6%) had similar recall. The evaluation demonstrated that there was a loss of recall in their knowledge of basic sciences despite the fact that the case articles provided at least a week earlier. Although parasitology had a high recall rate (71.5%), this did not truly reflect good recall as the number of questions asked and the number of cases applicable were smaller in comparison to other subjects.

Bedside Teaching (Recall by Lecturer): Physical examination skills were evaluated during the short cases selected “on the spot” and history taking skills in the long cases presented. Basic sciences questions were asked in relation to the findings of the case in order to facilitate problem-solving and clinical reasoning. The extent of basic science questions asked varied amongst the different lecturers. Ratings indicated that each case elicited recall of certain basic science subjects. Subjects frequently recalled included physiology, pathology, pathophysiology, anatomy and microbiology. Pharmacology and neurosciences were recalled to a lesser extent and parasitology was never asked. In most cases, the students had difficulty in recalling factual knowledge to correlate or analyse the findings of the case.

Students were better able to recall basic sciences in the written assessments as compared to verbal recall at the bedside teaching sessions. This demonstrated that they were able to answer direct questions on each of the basic science subjects in the written assessment but could not apply, correlate or synthesise the basic science knowledge in problem-solving or clinical reasoning at the bedside.

End-Of-Course Survey (Program Evaluation): Students perceived that the knowledge of basic sciences relevant to clinical teaching was highest for physiology, pathology and pharmacology followed by microbiology and lowest for parasitology. This was in agreement with the written assessments as well as the lecturers’ recall at the bedside

This evaluation demonstrates the need to design more effective teaching-learning methodologies to reduce loss of basic science knowledge and to enable students to apply correlate and synthesise this knowledge in problem-solving or clinical reasoning.