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The Artificial Divide Between Biomedical Sciences and Clinical Medicine in Undergraduate Medical Education

Sir,

Undergraduate medical curriculum has traditionally been divided into two separate parts consisting of biomedical sciences and clinical medicine respectively. Lecture-based didactic strategies were employed in the past to imprint basic science knowledge to medical students. However, evidence-based strategies have now shown that Problem-Based Learning (PBL) system has several advantages over the traditional lecture system.¹ Consequently, many medical institutions across the globe have implemented changes in their undergraduate medical curricula to integrate clinical medicine and biomedical sciences together, in order to improve retention of basic science knowledge and enhance problem-solving capabilities of fresh medical graduates.²

Over the past several decades, a growing body of evidence has shown that a significant proportion of knowledge taught during the basic science years of undergraduate medical curriculum is lost in the subsequent years.³⁻⁵ Decrement in basic science knowledge is seen across all disciplines with the most profound deficit developing in the fields of biochemistry and microbiology.⁵ The reasons for this decrement are variable and the most often reported reason by medical students themselves is that a substantial proportion of the course material taught during medical school is not relevant to their later clinical work.⁴ Thus it can be inferred that the most important determinant of retention of basic science knowledge is the perceived relevance of this knowledge to future clinical practice.

The importance of integrating biomedical sciences and clinical medicine together has been realized for the past several decades. A number of strategies have been devised in various parts of the world to integrate the two together including the use of a PBL system, modules of back-to-basics in clinical years and a spirally designed curriculum. However, we believe that a medical curriculum can be adopted, which, from day one, amalgamates biomedical and clinical sciences together. Although such a proposal may seem implausible at first, it is more pragmatic than the traditional approach. Fresh medical students, in such a curriculum, can be taught along the format of systematic modules, whereby, in

each module, students would learn all relevant biomedical sciences in conjunction with the relevant clinical science. The theoretical merit of such an approach is apparent in that students will be able to readily perceive the importance of learning basic science knowledge in order to grasp an understanding of clinical medicine. Moreover, all the knowledge gained in a particular module would be integrated within and across biological sciences and clinical medicine, resulting in greater retention and improved comprehension, analysis, synthesis and application of knowledge (higher cognitive levels of Bloom's taxonomy). Although the burden of studying in this approach would be higher (upto 10 different disciplines at the same time), the theoretical merits of this approach are promising and preliminary research studies on such an approach have shown favourable results.

In Pakistan, many medical schools continue to teach a medical curriculum based entirely on traditional lecture-based strategies, even though a growing body of evidence suggests that PBL-based systems afford better outcomes. Medical education in the present era continues to move towards an integrated and focused approach, and systems of medical education in Pakistan will need to change and evolve over time to keep abreast with recent developments. In our opinion, a curriculum of medicine, which amalgamates biomedical sciences and clinical medicine together, seems to be the most reasonable balance between retention of basic science knowledge and acquisition of problem-solving skills.

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