Stimulating student interest in physiology: the intermedical school physiology quiz

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THE INTERMEDICAL SCHOOL PHYSIOLOGY QUIZ (IMSPQ) was initiated in 2003 during my last sabbatical from the University of Malaya. At this inaugural event, there were just seven competing teams from Malaysian medical schools. The challenge trophy for the IMSPQ is named in honor of Prof. A. Raman. Prof. Raman was the first Malaysian Professor of Physiology at the University of Malaya, and he passed away suddenly of a cardiac arrest in 1998.

The interest generated by this physiology quiz has been very encouraging. At the sixth IMSPQ in 2008 and seventh IMSPQ in 2009, the competition expanded to >30 university teams with more than half of the teams from overseas. IMSPQ gatherings have included medical students from Taiwan, Hong Kong, China, Thailand, the Philippines, Indonesia, Singapore, India, Sri Lanka, Australia, and the Czech Republic.

The IMSPQ has become a wonderful platform for international students to meet and establish friendships. The accompanying lecturers of the teams have also the opportunity to network and share interest in the teaching of physiology.

Mechanism of the Quiz

The inaugural competition in 2003 was a 1-day event with teams comprising a minimum of three to five students. Teams were paired at random and competed before a live audience. The Quiz Master fielded the questions. Questions in each session covered topics from every organ system in physiology.

In 2008 and 2009, the growth of the IMSPQ required the competition to expand to a 2-day event. On day 1 (Friday), there was a multiple-choice test for the purpose of ranking the teams. Rank data were used to group the 30-plus teams into different groups for the oral competition on day 2 (Saturday) (like a soccer league!).

The results of the ranking and grouping were done during the same Friday evening when the teams gather for a quiz concert night. Song and dance items were presented by the participating teams, and test results were announced between items (like the Academy Awards!). This year, the best 5 of the 149 students in the multiple-choice test received an American Physiological Society t-shirt kindly donated by Dr. Marsha Matyas.

Designing Quiz Questions

This is perhaps the most essential and hardest part of the planning for any IMSPQ.

Questions are generated by University of Malaya faculty members and are also provided from other participating universities. Questions were vetted by several guidelines:

1. As much as possible, the questions should test concepts or understanding of physiology rather than mere recall. These criteria apply for both the multiple-choice and oral questions.

2. The questions should require concise answers so that it is easier for the panel of judges to evaluate when the Quiz Master is unsure of the adequacy of the response. The Quiz Master should preferably be a content expert and form part of the panel of judges.

3. Questions in each session during every round of the quiz should be of equivalent difficulty for a fair competition.

The panel of judges should include suitably qualified accompanying lecturers from the participating institutions. As far as possible, when a particular university is competing, the accompanying lecturer should not be used in the panel of judges to prevent a conflict of interest.

Some Sample Quiz Questions

To illustrate what we sought to test, the following are some quiz questions:

**Question 1:** what is the osmolarity of interstitial fluid? The answer is ~300 mosM/L, the same as for plasma, since interstitial fluid is a component of extracellular fluid and the concentration of sodium, the main determinant, is basically the same in plasma and interstitial fluid. This question is preferred rather than simply asking for the osmolarity of plasma. Remember that these students are preselected top students from each medical school.

**Question 2:** what is the osmotic pressure contributed by sodium ions at the capillary? The answer is 0 mmHg, since sodium is a penetrating solute at the capillary, unlike at the cell membrane. This question is preferred over a question that asks for the plasma oncotic pressure, which most medical students would have memorized.

Prizes

Without exception, no competition is complete without a reward for the best performance. It is not quite good enough to be just announced as the winner of an IMSPQ! The publisher McGraw-Hill has generously donated to each of the five students of the champion team a two-volume set of Harrison’s Practice of Medicine. The organizers decided to not give physiology books as prizes, since these students are moving into clinical year courses. The University of Malaya has also financially sponsored the IMSPQ to promote the university and its international academic activities. Second and third prize winners are also rewarded. Each of the 30-plus team members receive a Certificate of Participation and a souvenir.
Insights and Gains From the IMSPQ

Over the quiz weekend, the opportunity to talk to both lecturers and students from so many medical schools in Asia and outside of the region is always memorable and invaluable. Here are a few observations and thoughts gained from my experience with the IMSPQ:

1. Hearing the students’ responses to the questions during the oral session is instructive as it gives an idea of the student’s understanding and perhaps a reflection of how certain physiology aspects are taught in that medical school. The item analysis done on the multiple-choice question test as well as each university team member’s responses to the questions are also enlightening; they tell us which physiology concepts are universally more easily grasped and which are not (or not as well explained and taught at the particular university!).

2. With regard to the comprehension of English language in learning physiology, it was an eye opener to have participating teams from countries where the medium of instruction is not in English. At the sixth and seventh IMSPQ, the Chulalongkorn team from Bangkok, Thailand, emerged as the first ranked team in the multiple-choice question test. In the sixth IMSPQ, the Chulalongkorn team went on to the quarter finals in the oral session (the Thais had a spoken disadvantage as they met the English-speaking University of New South Wales, Australia, team). This year, the Chulalongkorn team was the second prize winner at the seventh IMSPQ!

Each year, as Chairperson of this IMSPQ, it is mentally exhausting but a very satisfying and enriching experience for me and to also be one of the Quiz Masters of this public physiology event.

We look forward to welcoming teams from other continents not yet represented in the IMSPQ, like the United States, Latin America, and Africa. There is a Facebook entry for the 2009 seventh IMSPQ, where the quiz program containing all the team photos has been uploaded. A dedicated website for the IMSPQ should be up, as we plan even now for the eighth IMSPQ in 2010. Welcome to multicultural, beautiful Malaysia!!