Beijing declaration on medical pathophysiology education

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Submitted 27 July 2007; accepted in final form 27 July 2007

THE INTERNATIONAL SOCIETY FOR PATHOPHYSIOLOGY (ISP), at its fifth quadrennial conference in Beijing, China, in 2006, adopted a declaration related to pathophysiological teaching and learning issues (APPENDIX). The ISP Declaration is a blueprint document that refers to the present position of pathophysiology in medical education. Pathophysiology is not thought of at all medical universities as an independent course. All medical curricula, however, recognize the necessity and importance of understanding the etiology and pathogenesis of disease for medical practice. The ISP Declaration outlines the rationale and didactic advantages of an integrative approach that is critical for the contemporary complexity of biomedical information and methodology.

Scientific advancements in biomedical research have been generating copious amounts of verifiable data on human physiological and pathophysiological phenomena. New conceptual frameworks have been created, and sophisticated methodologies and powerful information computing systems have come close to the everyday practice of medicine. There is an exponential growth of potentially relevant and applicable knowledge. Meaningful teaching and learning of medicine and comprehensive didactic approaches have become an urgent demand.

The human body is a complex system. Nonlinear alterations of homeodynamics parameters are more and more recognized as important components that help explain the systemic biological foundation of certain medical phenomena. Biostatistical methodologies and traditional mechanistic interpretations are helpful in dealing with the fragmented reality of analytical descriptions. However, the complex system of the body demonstrates unique properties of functional reactivity that are not predictable from the traditional way of interpretation.

Present practical medicine is highly compartmentalized into subspecialized fields. Educational curricula are designed in a similar way. Such structure silently imposes internal limits and makes the profession sensitive to unwanted influences, such as pharmaceutical industry pressure, overinterpretation of molecular data, etc. Evidence-based medicine may be one useful way to upgrade clinical practice and clinical reasoning. Since medical knowledge is based both on qualitative and quantitative types of information, it is not always easy to make a comprehensive framework of given phenomena. Contemporary biomedical thinking is challenged by a complexity of empirical data, throughput quantities of molecular data in the postgenomic era, and demands of a solid and reliable frame of reference.

The ISP Declaration emphasizes the importance of integrated teaching and learning in medicine. A pathophysiological approach involves vertical, horizontal, and longitudinal integration. A coherent pathophysiological interpretation of clinical disease phenomena is based on heterogeneous data. It drives the study efforts toward a synthetic view of etiopathogenetic pathways as a foundation of clinical reasoning. Therefore, the pathophysiological approach may catalyze proper orientation and facilitate advancements of evidence-based curricula. Medical teaching based on pathophysiology adds up to meaningful interpretations and general quality assurance.

The ISP Declaration is the ISP’s recommendation to professional national societies, policy makers, and curricular designers. It recalls the specific mission of biomedical education and public demands for reconsideration of patterns of education. At the national and institutional levels, it may be seen as a useful guideline written by professionals who are trying to bridge the basic/clinical chasm in medicine.

APPENDIX

INTERNATIONAL SOCIETY FOR PATHOPHYSIOLOGY (ISP)

With reference to:
- Enhanced advances in the field of pathobiology and related subjects, methodologies and concepts that bring a new light into the nature of diseases,
- Emerging theoretical concepts and practical perspectives that form a new frame of reference related to molecular biology and medicine,
- The rapidly changing lifestyles in the developed world and the overexposure of its increasingly sedentary population to a growing burden of chemicals due to over-prescription of drugs as well as the ever more frequent use of electromagnetic and ionizing radiation for diagnosis and treatment,
- The growing pressure of contemporary society and public demands for reconsideration of the scope, quantity, and quality of medical education,
- The necessity of providing pathophysiologically relevant information which will help academic policy makers in redesigning and upgrading curricular structures and guidelines,
- The specific mission of a biomedical education system to advance and restore health, and to secure a better quality of life for the chronically ill and disabled:

The ISP during its Fifth International Congress of Pathophysiology ISP 2006 held at Beijing, China (June 28–July 1, 2006) adopted the following:

ISP DECLARATION CONCERNING THE ROLE AND POSITION OF PATHOPHYSIOLOGICAL TEACHING/LEARNING IN BIOMEDICAL CURRICULA

1. The sequencing of the human genome and related molecular frontline research (proteomics, metabolomics, pharmacogenomics, etc.) and progress in biophysics as well as in
computing has underlined the importance of horizontal and vertical teaching/learning in health sciences. Integrative pathophysiology is a powerful tool in the quest to comprehend pathobiological processes as a foundation of effective clinical reasoning and a proper appreciation of disease.

2. Pathophysiological analysis, the integration of regulatory homeostasis and homeodynamics of body processes and the interconnectivity between them, lays down a solid approach toward a comprehensive vision and a more complete understanding of the etiology and pathogenesis of disease. Emerging important biomedical principles bring together both clinical and preclinical knowledge and directly guide students along the path of evidence-based medicine.

3. The rapid expansion of scientific knowledge related to multiple facets of a complex pathobiological phenomenon increasingly enables a quantitative estimation of relevant processes within an integral body system. Recognition of primary, secondary, and less immediate pathogenic mechanisms leads toward an internally consistent description of the natural course of disease.

4. Integrative pathophysiological teaching/learning increases the student’s drive to obtain and retain theoretical, practical, and usable knowledge/competence. Integration leads to a better understanding, retention of knowledge, as well as an appreciation of the hierarchy of disease mechanisms (molecular, biophysical, subcellular, cellular, organ, systemic, epidemiological), and a synthetic view of morphological, biochemical, genetic, and clinical knowledge.

5. Sustainable reforms of biomedical curricula should observe and implement proper pathophysiological teaching/learning strategies. The ISP recommends that 8% or more of the total teaching/learning hours should be dedicated to the pathophysiological consideration of disease and pre-disease states and conditions. Optimally, half of these hours should consist of general pathophysiology, dealing with common concepts, principles, and patterns of etiology and pathogenesis.

6. The understanding of complex phenomena involves synthesis of information derived from many sources (maximal insight). Further understanding is achieved by doing, reinforcement, repetition, and continuing referral to diverse sources, thus leading to an increasing refinement and depth of perception (consensual validation). In pathophysiology this refinement of insight involves recognition of both feedback and feedforward loops in the processes of etiopathogenesis.

7. The methods used in the teaching/learning of pathophysiology should not ignore parallel and contextual mechanisms and potential etiopathogenetic points of branching within consideration of a basic/dominant pathogenetic mechanism. Implementation of such etiopathogenetic reasoning is an essential and reliable foundation for diagnostic and therapeutic interventions as well as prevention.

8. Adoption of an integrative approach to thinking and acquiring knowledge makes it possible to synthesise coherent structures from heterogeneous data. This approach is equally relevant to the study of general and specialized pathophysiology (nosology), and should be applied within various teaching/learning forms, such as classical seminars, problem-based-learning modules, practicals, clinical rounds, etc.