



## Editorial

# Think out of the box – Revive Physiology!!!

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Since medieval times till the mid of twentieth century medical science was synonymous with physiology when “mushrooming” of specialities, sub-specialities in medical science occurred and off-late in the last part of twentieth and in the beginning of twenty-first century; “off-shooting” of super-specialities from broad specialities made contemporary ‘patient care’ much sophisticated, precise and “segmented” at the expense of departure from the holistic approach of a ‘family physician’ in olden days.

The reductionist approach in understanding individual tissue and organ physiology is analogous to speciality medical care whereas a systems approach in physiology is akin to holistic medical care. With advances in technology the reductionist approach reached cellular, molecular and even atomic level. Systems and holistic approach also deals with patterning of activity – either simultaneously or sequentially or a complex interaction of sub-systems which is the hallmark of all living organisms.

Overtime, the continual study of human body during normalcy and through disease period has become so vast and enormous that it led to staggering and alignment of various medical

science subjects in evolving a curriculum for medical education. This staggering goes in line with the reductionist approach which had segregated the medical science subjects into ‘pre-clinical’, ‘para-clinical’ and ‘clinical’ specialities.

Doctors who chose or are destined to become ‘medical teachers’ were confined to the boundaries of a medical school / medical college especially those involved in basic medical sciences. The editors of this journal aim at igniting research interest and bring out physiologists from the usual environs of classroom teaching.

Physiologists in India need to be ‘reinvented’. The Medical Council of India (MCI), a statutory body, which directs and oversees the medical education in this country has emphasized on problem-based learning and early clinical-exposure for medical students. Traditionally the ‘pre-clinical’ specialities like Physiology and Anatomy were considered to be foundation subjects in medicine but are now part of ‘prevention-based science’ which is one of the core element of primary healthcare and the MCI proposed reforms in the medical curriculum to produce ‘physicians of first contact’ competent enough to handle common health conditions single-handedly.<sup>1</sup>

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Choosing teaching should not deter the physiologist from being a competent physician. A medical teacher is always required to be abreast with the current development in medical science and to apply it in teaching as well as in treating patients. Physiologist, in most situations, may not be the primary treating physician but can be a part of healthcare team who is responsible for overall management of patient. Research is part and parcel of the medical teaching profession. Physiologist must be keen in their observations and be a part of clinical establishment then only the bench research can be translated into bed-side medical practice.

Invention of telescope has brought the celestial world in the vision of mankind. Likewise a physician's keen observation envisages the internal fighting of his patient and fetches the diagnosis. Similarly the imagination of the dedicated researcher intrigued by the disease or microbes opens the door to the innumerable explanations followed by tangible understanding of the health condition. This not only helps in treating the disorder but also facilitate in developing preventive strategy.

Physiologists should make remarkable contribution by their inquisitiveness in the understanding of body functions and how body behaves in a disease situation. This logical and systematic approach tends to deliver holistic treatment rather than a 'speciality care' and physiologist will then become part of this healthcare delivery team. The 'clinical physiologist' may sometimes play a major role in treating a patient or salvaging a patient in a life threatening situation. This is very aptly exemplified by a case of unusual acute respiratory decompensation by Keenan and John Marini<sup>2,3</sup> which was tackled successfully by application of thorough knowledge of cardiovascular-pulmonary physiology. In brief, an obese patient on positive-pressure ventilation experienced severe rise in peak and plateau pressures after receiving neuromuscular blockade which was treated by applying in-depth knowledge of mechanics of respiration, airway resistance, chest wall compliance and pulmonary pressure changes during respiratory cycle.

Other facet of human suffering apart from disease per se is economic backlash encountered by the family due to siphoning of their money in the epoch of spiralling increase in healthcare cost. This financial burden is sure to reflect on the community and the nation as a whole. The significant role of a 'clinical physiologist' must be understood in

'prevention-based medical science' to achieve overall reduction in healthcare cost. At the summit of this detailed understanding of biology and physiology, people have advocated and started applying this knowledge in solving environmental, social and economic problems – a field known as 'Bio-mimicry'.<sup>4</sup> Bio-mimicry is a science that studies nature's / biological models and then imitates or takes inspiration from these structural designs and physiological processes to solve human problems. Living organisms have evolved well-adapted structures and materials — stratified stabilities — over geological time through natural selection. Mankind has looked at nature for answers to various problems over ages. In present times, bio-mimetics has given rise to new technologies inspired by biological solutions at macro and nanoscales like "Mirasol" display technology.<sup>4</sup>

Not that basic medical sciences departments has dearth of good teachers or researchers, there is a hitch in influencing the physicians for application of physiological principles or translating their basic medical research into management of the disordered condition. Henceforth the physiologist should mantle the role of a co-ordinator or facilitator for the healthcare delivery team in order to optimize the available resources and bring out best possible solution for the health related issue.

There are no rigid boundaries for physiology. *"Think out of the box"* — expand your vision beyond teaching, nurture your ideas to come up with path-breaking scientific and research findings and be a guiding force to the treating physicians. This is the course of action to be taken to *"Revive Physiology"*.

**Conflict of interest:** None

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