

Letter in Response to Published Article

Nurture Indian dermatology innovations as man-maximum, machine-minimum research

Sir,

Indian doctors, during their training, read western books that focus mainly on diseases that are concentrated in developed nations. Our initial training on important diseases of India gets limited to its understanding by western authors. Consider Vitiligo patients who do not respond to phototherapy. Shouldn't Indian dermatologists study why this happens? Pasricha advised to confront Indian problems with Indian solutions. He suggested that Indian academia could work as extended research and development wings of pharmaceuticals instead of producing robots that extend western research laboratories.¹ Innovations of Srinivas, our teacher, led to better management of his chronic skin patients.² How do we cultivate a culture of innovation among young dermatologists? Innovations begin by recording and structuring tacit and highly subjective insights that are often ignored as "silly." Systematic information processing will convert such ideas into innovations. Information processing should supplement basic learning in medical colleges and incremental gains from clinical experience. Frequent brainstorming and sharing ideas and knowledge with colleagues are central to converting ideas into innovations. Those who are new to conference/journal discussion groups could stumble on communication dysfunction; "we know more than we could express." Colleagues must help them come out of this bottleneck. Innovation begins by better managing their "knowledge and intellect." This requires sharing, transfer of knowledge, and even learning skills from technicians. A classical example is the invention of bread making machines; producing similar color, taste, and consistency as that of manually prepared breads. Matsushika electric company in Japan asked its software developer Ikuko Tamaka to work with the head baker of Osaka international hotel. Tamaka spent a few weeks assisting and observing distinctive ways of stretching the dough to gain consistency and taste. Tamaka learnt this manual "twist dough" bread making and adopted the finger movements by inserting additional ribs to the machine.³ Banana leaf bed sheets and its disinfection are a similar observation in India that reduced pain in bullous diseases from the sticking of bed sheets.

"Everyone cannot become Archimedes;"² but is there a way to train young dermatologists to become innovators? Young dermatologists must be made aware of their strengths and of ways to improvise them. Psychologists recognize that there is a distinct intellectual dominance similar to dominance of one hemisphere of brain in right and left handers. The left-brain thinkers are predominantly analytical, logical, having stepwise approach to problem solving. Gut feelings (intuitive), value-based, and nonsequential approach to patients' problems come from right brain thinking. Right-brained people look at the big picture, relationships, and patterns in existing data whereas left-brained people focus on details and often look at data-based evidence to resolve issues. There are two instruments to identify this intellectual dominance; identifying how we think:

the Myers-Briggs type indicators and Herrmann brain dominance instrument. In the current scenario of student admissions and staff recruitments, there is little opportunity to transform the entire department to research culture purely on merit. The leader of the department has to identify available talent (intellect) of teaching staff, students, paramedical staff, and nonclinical staff. The leader should attain a "balance" of left and right-brained people in a team and assign them to address a selected problem. Nurturing the intellect of paramedical and nonclinical staff is essential. Small teams who do not have celebrities as great achievers could innovate if they are "whole brained" and have social empathy, allowing them to share knowledge and experience with colleagues, related disciplines, and patients. Such teams should be encouraged to perform small activities every day that lead to incremental gains as structured knowledge. This can be done by experimenting with ideas of a team member as soon as they occur. Using steps such as documenting new observations, relating them to past experience to look for patterns, and adopting best practices and protocols for patient care will lead to small steps in the march towards innovation. There should be a process to support and integrate such ideas into the daily routine. At the Institute of Applied Dermatology, such new flashes are known as "great ideas." Dermatology counseling department, "dermatology nurses," therapists, and staff at community dermatology outreach programs always conduct an informal survey (inquiries) on patients' sufferings which often generates "great ideas." They include inserting low adherent and highly absorbent cotton and acrylic dressing pads to the intertrigo of toe web spaces. Great ideas are later linked to systematic patients' problem-solving sessions to undergo repeated molting before its metamorphosis into a full research question. In this world of peer review, consensus building through sharing and rating the idea is an initial step. Next is the analysis of cause and effect, linking the idea to the ontology of the problem through literature search that should go beyond PubMed. This should be followed by activity planning and setting milestones to cross. Xerox's problem-solving process is a popular model put forward during human resource development training. A proposal to simplify Institute of Applied Dermatology's self-care lymphoedema treatment protocol originated when our nurses visited patients to understand how home based self-care is carried out. A survey finding led to a brainstorming on why some patients are not concordant to treatment procedures. It later evolved as a research question and ranked as the top priority for morbidity reduction in lymphoedema research.⁴

Let us consider how to further innovate treatments for toe web space intertrigo, a challenge in the management of lymphoedema. It is a bacterial entry lesion and a major risk factor for recurrent cellulitis that leads to disease progression. Only 18% of the lesions had positive microscopy or culture for fungi (dermatophytes and *Scytalidium*).⁵ Despite the latest antifungal and toe separators, it

refuses to be eliminated. In eliminating intertrigo, the right-brained approach would be to use toe separators to reduce maceration coupled with different antifungals. In our experience of treating over 2700 lymphoedema patients, this combination didn't always work. In fishermen, toe separators have little value. Left-brained approach would search and systematically analyze literature. Hassab-El-Naby *et al.* showed that many cases of web space lesions can be overdiagnosed, underdiagnosed, or misdiagnosed. Intertrigo may be caused by different conditions including eczema, fungi, erythrasma, callosity, wart, or even lichen planus.⁶ Whole-brained approach is thus essential to address many such diseases.

When we don't have the required intellect or facilities, whole-brained teams could be formed through collaborations, as not all clinical issues can be resolved through applied research alone. Applied dermatology focuses on routine practice problems. Basic sciences view these problems at a tissue and molecular level. Basic science research will help us view clinical problems, fundamentally, in a different manner. This would be most beneficial for chronic disease management that has no readymade interventions available in biomedicine. This approach requires clinical investigators to team up with patients and collaborate with pathologists, big data analysts, and molecular biologists to generate greater insights into data analysis, and thereby disease reversal mechanisms. This will, in turn, lead to intersectoral collaborations through inter-institutional links and help in capacity building of all collaborating institutions. The coming-together of such institutions will bring in the much-required expertise, which is nonexistent in individual teams, to the clinical investigator led pioneering studies. We believe that such teams, by setting a goal of new innovation, should be developed over a long period of time; however, these teams may require decades of isolation and perseverance as in the case of Institute of Applied Dermatology.

Past presidents of the Indian Association of Dermatologists, Venereologists & Leprologists (IADVL) felt that such teams are rare and not many institutes exist in India dedicated to dermatology.⁷ National association should initiate programs to develop such teams of Indian dermatologists with long-term goals. The Association must identify "IADVL Mentors" to dedicate time to nurture innovative teams. One model for mentoring is that of Professor Terence Ryan who initiated the dermatology department at Oxford, UK. Post retirement, he has been tirelessly mentoring the team at the Institute of Applied Dermatology and its work, a process that began as a small steering committee formed in 2002.⁸ Our team was unlike one of his back home. Institute functions in a poor-resource setting and in isolation from academia and large modern medical facilities. Ryan's dedicated mentoring led to an innovation in dermatology and was awarded Neutrogena oration in 2011 [Figure 1]. He focused on the needs of community dermatology through "man-maximum and machine-minimum" approach.³ Ryan himself nurtured his own dermatology innovations in an incremental manner. The photobiologist Ian Magnus in his Dowling oration (1969) said "Scientists and research workers need plenty of 'lateral thinking', of provocative and disturbing ideas...Examples in British dermatology of such disturbers of the peace are in Ian Whimster and Terence Ryan."⁹



Figure 1: Indian innovation mentored by Terence Ryan, emeritus professor of dermatology, Oxford: response of lower extremity lymphatic filariasis (lymphoedema) to self-care and home based integrative medicine treatment is maintained after 12 years

Ideas exist in abundance at all levels of life and workplace in diverse India. Mentors must devote sufficient time to mentees to nurture innovation culture among Indian dermatology circles. "IADVL mentors" must push their mentees beyond the comfort of book knowledge. Intellect expands when frequently dealing with challenges. Mentors should be intolerant to partial efforts made by mentees and motivate young dermatologists to "create a future" dermatology service "that would not have existed without them."³

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