Practicing Purposeful Research

“Some of our patients are tiny, only days or weeks old, yet they come to us with very complicated conditions that require surgery and long-term care. It is a challenge to understand how much the baby sees or even improves with our management. So, we developed a special device called BaViS (Baby Vision Screener, earlier called Paediatric Perimeter) to ‘screen’ such babies at our Centre for Technology Innovation. We can now record, in a matter of minutes, changes in the baby's "looking behaviour" before and after surgery (such as for the removal of a congenital cataract) thanks to BaViS. The device helps us get a quick, quantitative measure till the babies are old enough to start identifying symbols and letters.”

This is an excerpt from a presentation made by Ms. Monika Thakur who is pursuing her PhD with our colleague, PremNandhini Satgunam. PremNandhini (PN, to many) is an optometrist and vision scientist. She started working on a paediatric perimeter nearly 10 years ago, during one of the hackathons at our Center for Technology Innovation (CFTI). We had identified an unmet need in assessing the vision and field-of-vision in newborns and very young infants. PN joined a team of engineers, designers, and practicing clinicians to tackle this need. Their efforts led to the development of a BaViS precursor that allowed us to reliably assess the field-of-vision in infants. Today, BaViS is patented both in India and USA. The device has been refined and has evolved to assess not only the field-of-vision but also brain development in these young babies. PN has been feted with multiple awards, including the prestigious Pfizer Ophthalmics Carl Camras Translational Research Award of the Association for Research in Vision and Ophthalmology (ARVO) foundation in 2022.

Translational Research

The BaVis story reflects the research ethos at L V Prasad Eye Institute--research that bridges gaps from the bench to the bedside, onto the communities we serve. It translates into improved care practices and improved public health. I am always surprised to find that “Translational Research” remains an “emerging” set of research-related discourses and practices within biomedicine. Translation is always “emerging” because of the perceived gaps between life sciences and medical research on the one hand, and clinical practices that are guided by measurable health outcomes on the other. The true promise of translational research, at least at LVPEI, is to ensure that our investments in the vision sciences result in improved care practices and improved eye health for our communities.

So, creating a work environment that bridges such perceived divides between basic science and the clinic, as well as the commercial teams, is the first major challenge to tackle. From the very beginning, LVPEI’s basic science laboratories sat in the same building as our clinical facilities. This creates both formal and serendipitous opportunities for interactions between basic scientists, clinicians, and now, even engineers, other life sciences specialists, and those from the humanities as well. At LVPEI, all clinical faculty also commit time to research.

This rich and enabling environment at LVPEI has resulted in several pathbreaking innovations that are grounded in research and have become a part of our standard clinical practices. This research has improved outcomes for treatments offered to tackle several diseases. Simple Limbal stem cell transplantation or SLET,

identification and management of Pythium and Microsporidia, and Endophthalmitis diagnosis and management are all great examples of this approach to translation from the research bench to the patient's bedside. The institute's many accolades including its place among the top 10 leading eye institutions of the world for research in the SCImago ranking are thanks to such work.

A path for the future

Last month, I wrote to you about the key strategic goals my team will pursue in the next 5 years. For Research, our strategic focus will be to:

- focus on problems that are relevant and important for our population,
- work to find solutions for each one of these in cross-functional teams,
- develop collaborations with other groups or organisations having complementary goals, and
- take the knowledge generated beyond publications, into practical application in patient care as well as public health.

The LVPEI eye health pyramid provides a rich laboratory, from advanced tertiary eye care to applications in remote rural areas. Now, after nearly forty years of refining our research process, we need to expand the scope of research to improve healthcare availability, accessibility, and affordability. The strategic plan envisages LVPEI embracing new areas of research including operations research, newer forms of public health research, data science and machine learning, and the interplay between the eye and non-communicable diseases, to mention a few.

Our presence in Hyderabad, a hub of pharma manufacture and research, opens up opportunities in ocular pharmacology research. We can investigate both new drug discovery and create ophthalmic formulations of drugs that are either unavailable for ophthalmic use or need improvement in the quality of existing formulations. Soon, we are going to inaugurate the ocular pharmacology research centre, thanks to the generous support from Granules, a large pharmaceutical firm based in Hyderabad. I am happy to announce that Dr Sanhita Roy, our senior research scientist with a special focus on antimicrobial peptides, will be leading this initiative. With active collaborations already in place with several organisations such as the Centre for Cellular and Molecular Biology (CCMB), Hyderabad; Birla Institute of Technology and Science(BITS), Hyderabad; and Indian Institute of Technology (IIT), Hyderabad; I am confident that the centre will help us make new strides.

We have also started a technology transfer office to support innovation and commercialization within LVPEI. The office today is helping to disseminate information on the path from innovation to commercialization and is guiding scientists who have ideas with potential for commercialization.

These are all new initiatives in the right direction. I would argue, as I do today, that LVPEI is duty-bound to take our research efforts outside the four walls of our laboratories, into clinics and our communities. It must translate into improved quality of care and better outcomes for our patients. Therein lies our purpose.

-Prashant Garg