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Research Shapes Practice: The Future of Paediatric Research

Creating new knowledge and making discoveries to improve child health is the ultimate aim of paediatric research. Research in the young can be regarded as a continuum that spans from basic scientific research and discoveries, through translational studies, to clinical trials, and health care delivery and outcome research.¹ The spectrum of paediatric research synergises with programs of health care to achieve the aim through shaping the practice of paediatric medicine and influencing the making of child health policies.

Research in paediatrics has moved beyond pure academic pursuit of better understanding of the nature of paediatric conditions and phenomena, unravelling disease mechanisms, and disentangling complex interactions of body systems in the intra- and extra-uterine milieu of fetuses and children. Whereas basic research has been regarded in the 1940s in the United States to be 'research performed without thought of practical ends..... results in general knowledge and an understanding of nature and its laws',² the promotion in the 1990s of bench-to-bedside research has incentivised collaborations between basic scientists and clinical researchers and sped up the translation of discoveries into clinical therapeutics.³ For the realisation of health benefits, two translational blocks have been identified: i) the transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy, and prevention and their first test in humans, and ii) the translation of results from clinical studies into everyday clinical practice and health decision making.⁴ Paediatric translational research is but a part of a much larger scope of paediatric research. The full spectrum should, at least at present, encompass basic scientific works, patient-oriented research, outcome research, epidemiological studies, community-based research, and health policy and services research.

While most paediatricians may not directly be engaged in conducting research, their knowledge on the conduct of research and research methodologies helps in the critical evaluation of the scientific literature deemed useful for incorporation into daily clinical practice, their awareness of new research findings and guidelines promotes the practice of evidence-based paediatric medicine, and their involvement in the management and recruitment of paediatric patients provides support and data for different types of paediatric research. This diversity is illustrated by the articles published in this issue of the Journal. Türkyilmaz et al reviewed their surgical experience in the management of thyroid cancer and masses in children,⁵ while Jaing et al reviewed a relatively large cohort of paediatric patients with BK virus-associated haemorrhagic cystitis undergoing allogenic haematopoietic stem cell transplantation.⁶ Clinical experiences are disseminated through retrospective reviews of management and outcomes of specific patient groups. Cosar et al

explored possible associations between red blood cell width distribution and occurrence of transient tachypnoea of the newborn.⁷ Association studies, while providing grounds for speculations, need further research works to establish causal or other relationships. Benzer et al performed a prospective double-blind randomised study looking at the effect of sucrose on the control of pain secondary to screening of retinopathy of prematurity in preterm infants.⁸ The translational potential and applicability of findings of randomised trials still have to be subjected to the process of critical appraisal.

The scope of paediatric research has expanded and is expected to expand further in the times to come. The omics era has dawned, and the era of big data is here. How to harness the power of omics and big data is the crux of the question. Are we, as paediatricians, ready and equipped to harness the power of omics and big data? A recent article boldly predicts the next seven great achievements in paediatric research,⁹ which include new immunisations, cancer immunotherapy, genomic discoveries, identification of fetal and childhood antecedents of adult health, impact of interaction of biology and the physical and social environment, quality improvement science, and implementation and dissemination of research to reduce global poverty. There is no doubt that the practice of paediatric medicine in the next generation and the generations to follow is intricately linked to the future of paediatric research.

This is the best of times, in the midst of technological era and digital revolution, for paediatric researchers. For some, however, this may be the worst of times. Research expertise in multiples disciplines, including clinical, behavioural, developmental and community paediatric medicine, genetics, bioinformatics, epidemiology, big data analytics, sociology, economics and health policy analysis, is required. Refinement of the research skill sets, development of collaborative networks, and breakthroughs in mindset have become inevitable for the present and the new generation of paediatric researchers. There exist further challenges to conducting quality clinical paediatric research, some of which were highlighted in the recent UK national review:¹⁰ poorly equipped core research skills of clinical trainees, newly appointed consultants with little research experience, little contracted consultant time to support contribution to research, low recruitment rate of children into studies, lack of clinical research facilities in even children's hospital, low proportion of allocation of funding to paediatric research, and decreasing number of academic paediatricians.

It has become apparent that fostering young researchers

should be one of the goals of undergraduate training and grooming the next generation of paediatric researchers should constitute one of the priorities in paediatric fellowship programs. Alignment of paediatric research agendas with clinical care of children should provide opportunities to integrate clinical training with research.

With the imminent completion of the new Hong Kong Children's Hospital, which would provide an unprecedented opportunity for paediatric research by being the tertiary referral centre for complex, serious, and rare childhood diseases and through concentration of clinical expertise, it is timely for us to reflect on the journey of paediatric research in our locality and to dream our way forward. 'A thousand-mile journey begins with a single step (千里之行，始於足下)', said Laozi. Decades ago, our predecessors have taken the important first steps. Let us embrace the future and join hands to write a new chapter in paediatric research and health care in Hong Kong.

YF Cheung
Chief Editor

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