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. 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', 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. 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, their awareness of new research findings and guidelines into daily clinical practice, their critical evaluation of the scientific literature deemed useful for incorporation into daily clinical practice, their awareness of new research findings and guidelines. 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, while Jaing et al reviewed a relatively large cohort of paediatric patients with BK virus-associated haemorrhagic cystitis undergoing allogenic haematopoietic stem cell transplantation. 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. 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. 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,
which include new immunisations, cancer immunotherapy,
genomic discoveries, identification of fetal and childhood
ancestors 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: 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.

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