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Editorial

Making Sense of Digital Portraits of Clinical Data

Amid the COVID-19 pandemic, Musée du Louvre has 'dust off its treasures, even the least-known', as put forward by its President-Director, and released digital versions of its entire collections online.[1] The collections, amounting to more than 480,000 pieces of artwork, include near Eastern antiquities, Egyptian antiquities, Greek, Etruscan and Roman antiquities, Islamic art, paintings, medieval, renaissance and modern sculpture, prints and drawings, medieval, renaissance and modern decorative arts. This tour de force online platform provides yet another example of how digitalisation has reshaped the experience of art though removal of barriers of cost and accessibility. In medicine, digitalisation of health information has created opportunities and resources that our predecessors had never been able to dream of.

The articles included in this issue of the Journal describe common and less common paediatric conditions and can be envisaged as portraits of paediatric clinical data based on conventional analogue review of clinical notes, which are on the other hand increasingly documented in the form of electronic health records. Cheung et al reported the pattern of distribution of various functional headaches, pain characteristics, interventions and psychosocial impacts on the child and family,[2] Huang et al described the features and risks for acute kidney injury in children with IgA nephropathy,[3] Zhang et al described clinical features of Kawasaki disease in children with an atypical age of onset,[4] To et al reviewed the prevalence of different thyroid disorders and co-morbidities in children and adolescents with Down syndrome,[5] and finally, Chan et al performed a 20-year retrospective review of the clinical characteristics and outcomes of paediatric non-tuberculous mycobacterial infection.[6] While these sets of clinical data do convey important messages that would enhance understanding of the medical problems and clinical management of our patients, one begs to ask how we could make further sense of clinical information that is mostly stored nowadays in an electronic format.

In Hong Kong, the Hospital Authority has taken the lead to establish a territory-wide web-based electronic patient health record system that allows the integration in a real-time fashion of patient-based information to be shared among clinics, public hospitals and private hospitals.[7] At its core, the electronic health record is a digitised version of the medical notes, diagnostic reports, laboratory results, and images. A recent study has found that paediatricians spent an average of 16 minutes per encounter using the electronic health record, with chart review, documentation, and ordering functions accounting for most of the time.[8] While the distribution of time spent by each of the paediatricians was highly variable within subspecialty, it was similar across subspecialties. The time is probably well spent.

Widespread adoption of electronic health records in Hong Kong and elsewhere in the world has created a framework and a platform for not only the purpose of collection and sharing, but when combined with data analytics and interpretation, may further enhance patient management, health care efficiency, clinical decision making, prognostication, and clinical research beyond conventional trials.[9] Visualisation tools have been created to integrate and

manage the abundant and heterogeneous sets of electronic health data.[10] The increasing application of machine learning and artificial intelligence in the medical arena would no doubt further facilitate the exploitation of digital data as captured by the electronic health records for research. Indeed, in the field of paediatrics, machine learning has find increasing utilisation in neonatology, childhood psychiatry, and paediatric neurology.[11]

Extraction of relevant data from the electronic health records for analysis and research can be a daunting task. Different types of data are included in electronic medical records. Structured data include information as birth date, sex gender, physical growth measurements, vital parameters, and drug use. On the other hand, unstructured text, which is narrative in nature, includes admission and progress notes, discharge records, operation records, and radiology and pathology reports. The lack of structural frameworks renders digitisation of these texts difficult. The use of abbreviations and acronyms and the presence of spelling and grammatical errors further complicate the processing and analysis of these texts. Nonetheless, text mining enables the conversion of implicit knowledge hidden in the unstructured text into structured data that can be read by computers using natural language processing technologies.[12] Interestingly, a recent study revealed that while people are in general in favour of sharing medical data and agree that this would benefit health research, they are more cautious about sharing free-text than structured data.[13]

Bringing structure to the unstructured text in digital portraits of our patients is a challenging endeavour, but one that would reshape paediatric care and research through making greater sense of the ocean of implicit knowledge.

YF Cheung
Chief Editor

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