

## Editorial

### Emergency department direct access to computed tomography

#### 急症室電腦掃描的直接享用權

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Editor-in-Chief

Since its introduction in the 1970s, several generations of computed tomography (CT) scanners have been developed, with rapidly improving technology and efficiency. Today, CT has become an important tool in medical imaging to supplement conventional X-rays and ultrasonography. Although it is still quite expensive, it has become the gold standard in the diagnosis and management of a large number of different disease entities in the practice of Emergency Medicine.<sup>1</sup> For the diagnosis of cerebrovascular accidents and the detection of acute intracranial haemorrhage, especially subarachnoid haemorrhage and after trauma, CT is the imaging of choice. Although CT cannot assess intracranial pressure, it can demonstrate indirect evidence and reveal causes of raised intracranial pressure. CT is also useful in managing severe headache, seizure and altered mental status.<sup>1,2</sup> In the setting of trauma, CT is the first choice for solid organ injuries. It is also commonly used for evaluating facial and skull fractures, vertebral injuries, and complex fractures, especially those around joints. CT angiography of the chest is also becoming the primary method for detecting pulmonary embolism and aortic dissection, including traumatic aortic disruption. Appendicitis, abdominal aortic aneurysm, intestinal obstruction, diverticulitis and pancreatitis

are emergency conditions that are readily diagnosed and assessed by CT.<sup>1</sup>

Back in 1996, the Audit Commission of England and Wales recommended that 24-hour CT should be an essential support service for all emergency departments.<sup>3,4</sup> However, a recent informal survey showed that access to computed tomography in Hong Kong was still patchy. (Table 1, personal communication, 2007 September) In addition, radiologists were not readily available in most hospitals on a 24-hour basis for CT reporting. Together, these would seriously affect the promptness of CT utilisation and the accuracy of clinical interpretation, entailing risks of potentially preventable adverse outcomes. On the other hand, inappropriate hospital admission may be an alternative to circumvent these problems, resulting in the inefficient use of already strained resources.

There is no formal instruction in CT interpretation in most postgraduate emergency medicine training programmes, and Hong Kong is no exception. Non-concordance between radiologists and emergency physicians has been found in 14.8-38.7% of the cases, of these 41.1-62.3% were of potential or actual clinically significant consequence.<sup>2,5</sup> Misinterpretations included infarcts, mass lesions, cerebral oedema, parenchymal haemorrhage, and intracranial haematoma.<sup>2</sup> It has also been shown that there was no significant difference in the accuracy of CT interpretation with varying levels of experience or qualifications of emergency physicians. The

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suggested explanation for this was that formal training in CT interpretation, rather than emergency medicine skills, was the major determinant of interpretation accuracy.<sup>5</sup> The benchmark is certainly on-site radiologist reporting, but acceptable alternatives may include formal education in CT interpretation in residency training and continuing medical education programmes for emergency physicians, remote teleradiology reporting by a radiologist or even

radiology resident interpretation through an on-site or call-back arrangement.<sup>2,5-7</sup>

Clinically and medicolegally, the wide discrepancy in CT service among emergency departments in Hong Kong is highly undesirable, if not risky. The two problems – prompt access to CT imaging and accurate interpretation of the result – have to be addressed without further delay.

**Table 1.** Emergency physician's direct accessibility (i.e. without the need to go through other clinical specialties) to computed tomography in Hong Kong

Hospital	Non-contrast CT	Availability (hour/day)	Contrast CT	Availability (hour/day)	Urgent radiologist report
AHNSH	Cranial + quota for other body regions	24	Radiologist consultation required	24	Office hours & on special request
CMC	All body regions	24	All body regions	24	Office hours & radiologist on-call after office hours
KWH	For stroke protocol only	24	No	0	No
NDH	Cranial only	24	No	0	Office hours only
PMH	Cranial only	24	No	0	No
POH	All body regions	24	Radiologist consultation required	Office hours only	Office hours only
PWH	All body regions	24	All body regions	24	24-hour radiologist on-site
PYNEH	Cranial only	24	No	0	Office hours only
QEH	Cranial only	24	Aortic dissection only	24	Office hours only
QMH	No	0	No	0	NA
RH	Cranial only	24	No	0	Office hours on request
SJH	NA	0	NA	0	NA
TKOH	All body regions	24	All body regions	24	Office hours & radiologist on-call with PACS at home
TMH	All body regions	24	Radiologist consultation required	24	Non-contrast: office hours only Contrast: immediate
UCH	Head injury & stroke only	24	No	0	On special request only, including radiologist on-call
YCH	Head injury with GCS <15 & stroke only	24	No	0	No

CT=computed tomography; NA=not applicable; PACS=picture archiving and communication system

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