

**For information on  
8 February 2010**

**Legislative Council Panel on Health Services**

**Modernization of Medical Equipment in the Hospital Authority**

**PURPOSE**

The purpose of this paper is to brief members on the modernization of medical equipment in the Hospital Authority (HA) to improve the quality and effectiveness of HA's services.

**BACKGROUND**

2. Modern healthcare is heavily technology driven. Advancement in medical technology contributes to better patient care through faster and more accurate diagnosis. It also enables new, less invasive or more precise treatments for better clinical outcome. Apart from benefiting patients direct, the use of advanced medical technology such as molecular testing could render accurate and quick diagnosis of known and possibly new viruses, thereby speeding up isolation, treatment and contact tracing for quarantine purpose, which is particularly important during contingency such as the flu pandemic. The technology may also detect mutations that herald drug resistance or indicate the emergence of a more virulent strain.

3. HA attaches great importance to modernization and upgrading of its medical equipment and has made continuous efforts to keep modernizing in this regard in order to provide quality services to patients.

**MODERNIZATION OF MEDICAL EQUIPMENT**

4. With additional funding support from the Government, HA has allocated around \$1,280 million from 2007/08 to 2009/10 to carry out a major exercise for replacement and procurement of medical equipment. The various types of medical equipment procured in the exercise are set out at Annex. As a result, the percentage of major equipment (with unit cost exceeding \$1 million) that aged more ten years has been reduced from 42% to 36%. The technology

level and age profile of certain advanced equipment like Magnetic Resonance Imaging (MRI) scanners and Computerized Tomography (CT) scanners have been improved and are at present comparable to international standards.

## **PRIORITY AREAS FOR FURTHER MODERNIZATION OF MEDICAL EQUIPMENT**

5. To keep modernizing its medical equipment, HA has planned to work on the following priority areas:

### (a) Filmless HA project

6. The Filmless HA project is a HA-wide initiative to enable capturing, archiving and distributing radiology images in digital formats through electronic network and new generations of X-ray machines. The project aims to achieve seamless “anytime, anywhere” access to radiology results and images at all HA institutions without the need of printing or retrieving X-ray films. By going filmless in HA, X-ray and other images can be efficiently transmitted in digital format among all HA hospitals/clinics to facilitate diagnosis and treatment of patients, hence avoiding delay due to retrieval of films or loss of films. In addition, clinicians can adjust the contrast of digital images easily to avoid unnecessary re-examination and irradiation to patients.

7. HA plans to implement the Filmless HA project across all clusters in the next four years starting from 2010/11. Upon completion of the project, it is expected that the average turnaround time for archived images reaching the clinicians would be greatly shortened by ten times, while the number of patient examinations performed by each X-ray machine would increase by about 10% to 15%. The Filmless HA project will also contribute to the Government’s initiative of developing a territory-wide electronic Health Record system to facilitate data interface for public-private-partnership projects.

### (b) Imaging and cancer services

8. HA has been planning for the modernization of its equipment according to service demand and has accorded priority to improvements in pressure areas. Specifically for diagnostic imaging services, HA has over the past three years replaced a total of 10 CT scanners and four MRI scanners with new models with higher throughputs and more advanced functionalities in order to improve access to such services. The new models enable quick and accurate diagnosis of diseases such as cancer and cardiac diseases within hours to facilitate timely clinical decisions. To further improve the imaging services

and reduce the waiting time, HA has planned to add four CT scanners and three MRI scanners in the coming five years.

9. On the treatment of cancer, which is a prevalent cause of death in Hong Kong, radiation treatment is common through the use of Linear Accelerator. The technology advancement on the functionalities of Linear Accelerator has greatly improved the treatment and quality of care for cancer patients. HA has acquired new generations of Linear Accelerator equipped with Intensity Modulated Radiotherapy (IMRT) to enable precise delivery of irradiation, thereby avoiding the cause of injury to the surrounding normal tissues of the patients. New high-energy Linear Accelerators can be equipped with additional Volumetric Modulated Intensity Arc-Therapy (VMAT) device to shorten the time required for patient examination and radiotherapy treatment. It can also shorten the irradiation time by over 50% for some head and neck cancers, including nasopharyngeal carcinoma which is rather common in Hong Kong. In the past three years, HA has acquired 14 Linear Accelerators equipped with new technologies and will continue to buy additional Linear Accelerators in the coming year.

#### (c) Molecular testing and genetic services

10. Advanced technology in molecular testing and genetic services are playing an increasingly important role in modern healthcare. It provides crucial information on diagnosis to guide treatment of infectious diseases and cancers, and helps to predict serious adverse drug reactions, prenatal diagnosis and congenital diseases. Prior to the availability of molecular testing, the confirmation of Swine Influenza through the use of pathological cultures would take around five to seven days. Nowadays, the use of molecular testing for that purpose only takes half a day. The application of molecular testing to bacterial identification, such as detection of Methicillin Resistant Staphylococcus Aureus (MRSA), is shortened from two to three days to one day only.

11. As a contingency response to the Human Swine Influenza pandemic in 2009, HA has accelerated its plan to build up molecular testing capability for viral isolation and identification and has planned to adopt in the next two years new molecular testing technologies including Deoxyribonucleic acid (DNA) Extractors, Real-time Thermocyclers and DNA Sequencers. HA also plans to introduce new technology on detection of gene mutations to enhance the effectiveness of cancer treatment, and high resolution sequencing technology for more precise Human Leucocyte Antigen typing to facilitate the matching of organ transplant donors and recipients.

(d) Ongoing replacement of aged medical equipment

12. Meanwhile, HA will continue to replace its other aged medical equipment on an ongoing basis to ensure the safety and effectiveness in the use of various medical equipment for diagnosis and treatment on patients. It will also closely monitor the utilization of medical equipment and service demand to ensure proper and adequate equipment are available for delivery of quality healthcare.

**WAY FORWARD**

13. HA will continue to keep abreast of the development of evidence-based medical technology for assessing the need for adoption of new technology and at the same time plan for replacement of aged equipment. HA will also seek to optimize the utilization of available resources to improve the efficiency and quality of services to patients.

**ADVICE SOUGHT**

14. Members are invited to note the content of the paper.

Hospital Authority  
February 2010

**Types of medical equipment purchased by the Hospital Authority with additional funding from the Government from 2007/08 - 2009/10**

<u>Equipment Group</u>	<u>Cost</u> (\$ Million)
Radiological Equipment	522
Physiologic Equipment	91
Ventilator	46
Anaesthetic Machine	41
Pathology Equipment	82
Nuclear Medicine	17
Surgical Equipment	59
Operating Table	20
Renal Equipment	10
Endoscopic Equipment	29
Sterilizer	20
Telephone System	59
Ophthalmic Equipment	12
Radiotherapy Equipment	144
Other Equipment (e.g. Speech diagnosis unit; Walker, Lift)	128
Total	\$1,280 Million