CHAPTER 6 – OPTIMIZING TOTAL WORKLOAD

601 HA treasures human resources as its most valuable asset. Under its "People First" strategy, HA keeps on modernizing itself and developing a people plan so as to rebuild trust between the management and the frontline staff [6.1]. The Doctor Work Reform is a key corporate strategy and priority area for HA to attain this goal in the coming years.

602 The Steering Committee is aware of the potential risks of doctors working long hours and cognizant of the disparity in honorarium in recognizing the excess work hours and slow career progression of frontline doctors in certain clinical departments and specialties. These issues should be proactively and tactfully dealt with in order to boost the morale of doctors in the public sector.

603 The Steering Committee appreciates that the local healthcare settings differ greatly from the overseas counterparts and clinical specialties adopt different operational models and staffing deployment strategies to meet their service needs. Due consideration should therefore be given, by way of **consultation and stakeholder engagement**, to stratify and delineate the role and service delivery mode of hospitals in order to arrive at a rational Doctor Work Reform model that is able to cater for local needs and benefit the patients. The Steering Committee believes that strong management commitment, dedicated clinical leadership and multi-disciplinary collaboration are prerequisites for making the reform a success for the benefit of both doctors and patients.

OVERALL STRATEGY – A Local Reform Model Founded on Wide Consultation

604 Doctor Work Reform encompasses a number of key strategies that are aimed at optimizing doctors' workload and ensuring patient safety through process re-engineering, multi-disciplinary team work, engagement with stakeholders and standardization of clinical practices. The Reform provides a pragmatic solution to reduce avoidable night-time activities, replace overnight calls with a shift system and optimize the number of on-site doctors required in each hospital at night. Duties in clinical departments are to be re-organized so that on-site doctors will be actively working; and out-of-hour medical cover will be enhanced with professional competencies meeting service needs. The role of healthcare workers will also be redefined so that the **right care will be given to the right patients at the right time.** Acknowledging that **no one model would fit all**, the Steering Committee recognizes that there is no fast-track solution to tackle all issues related to Doctor Work Reform.

6.1 The 5 key corporate strategies, as per HA Chief Executive's keynote address in HA Convention 2007, are:
a) clinical innovation leading to more choices for patients
b) creating the informed patient through electronic health record
c) gaining a consensus on HA's core service offering
d) creating a people plan for HA
e) introducing a new HA internal resource allocation system

605 The Steering Committee puts forward the following reform strategies: (A) optimizing total workload, (B) changing the existing doctors' work pattern, (C) training under the new work hour arrangements, (D) targeting deployment of resources and (E) enhancing the honorarium system. Details of these reform strategies will be elaborated in the ensuing chapters.

OPTIMIZING TOTAL WORKLOAD

606 As a key reform strategy, the Steering Committee recommends HA to consider optimizing the total workload and reducing avoidable night activities currently shouldered by on-site doctors in all hospitals while ensuring quality patient care and safety through implementation of various strategies at the organization, cluster and hospital levels.

607 The Steering Committee recommends the following measures to optimize the workload of doctors:

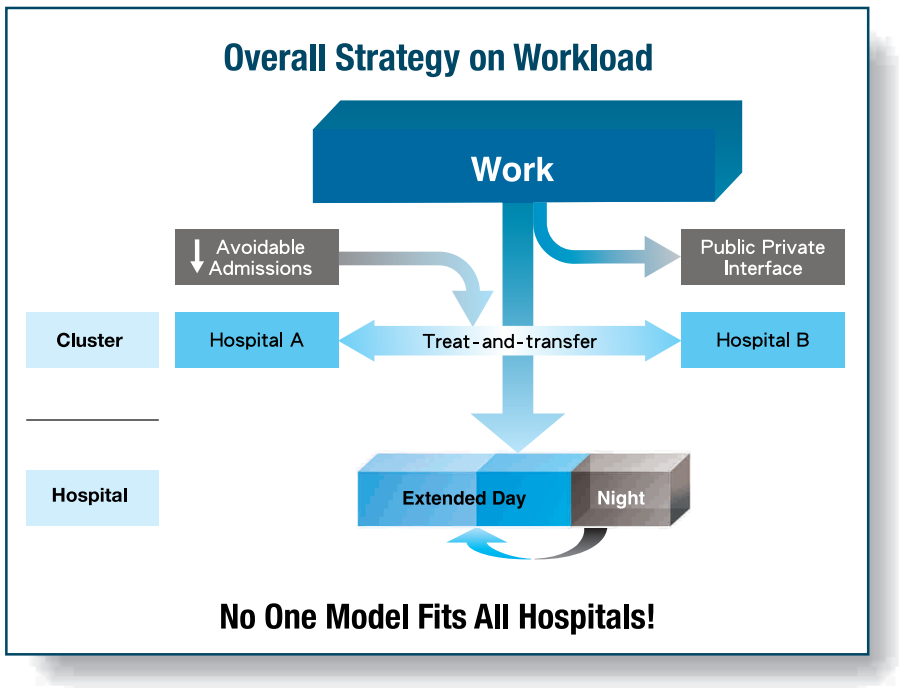
A1 – Managing workload at the macro level
- To reduce avoidable admissions
- To enhance public-private interface

A2 – Treat-and-transfer among hospitals
- To facilitate treatment and transfer of patients requiring emergency and highly sophisticated services to designated hospitals

A3 – Optimizing night activities in all hospitals
- To drive a conceptual shift from the conventional day-night mode to a new mode of extended-day service, with multi-disciplinary collaboration and protocol-driven support in patient care delivery

608 A summary of the above strategies is illustrated in Figure 6.1 below. The strategies will be further elaborated in the following paragraphs.

(Fig. 6.1)



Strategy A1 – Managing Workload at Macro Level

609 Managing workload at the macro level is to be achieved through two strategic approaches, namely, reducing avoidable admissions and enhancing public-private interface.

(I) Reducing Avoidable Admissions

610 Since provision of hospitalized care for a substantial number of patients is exerting the greatest pressure on the local public hospital system, the Steering Committee recommends HA to concentrate its efforts and reform strategies on reducing avoidable admissions. This is particularly pertinent in view that Hong Kong is facing a rapidly ageing population with multiple chronic diseases, which pose a great challenge and burden to the local healthcare system in the 21st century.

611 Noting that HA has embarked on numerous initiatives to reduce avoidable admissions in recent years, the Steering Committee recommends HA to place particular emphasis on two reform initiatives, namely, establishment of Emergency Medicine wards and exploration of extending the Telephone Nursing Consultation Service, which have proven effects in tackling the volume issues, to all hospital clusters.

Consultation: Feedback from Respondents

612 In general, doctors were supportive of reforms directed at reducing avoidable admissions with a view to reducing doctors' heavy workload, improving training opportunities and ensuring quality patient care and safety. However, some respondents had doubts over the effectiveness of the gatekeeper role of Accident & Emergency Departments in reducing avoidable admissions. They urged for more prudent application of admission criteria in order to effectively reduce avoidable workload. Certain doctors were also sceptical of whether Emergency Medicine service could substantially reduce admissions into orthopaedic wards at night, and HA might look to the outcome of pilot programmes before planning for further rollout. The Hong Kong Academy of Medicine supported this reform strategy but stressed that successful reduction of avoidable admissions should not be taken as a reason for reducing the number of doctors in the hospital workforce as doctors are needed for delivering quality patient services.

613 Concerning the extension of Telephone Nursing Consultation Service as a means to provide cost-effective care for complex patients, a view was received, suggesting that HA might consider assigning a single centre to concentrate experience and expertise in giving telephone consultations to all patients. Yet, some doctors raised that international literature provided weak support for such service and proposed HA to conduct more scientific review before investing further resources in this area.

The Steering Committee's View

614 The Steering Committee strongly agrees that reducing avoidable admissions is a fundamental way to curtail the overall workload of HA in general and the professional staff in particular. As HA's Chief Executive said, "the future of hospitals is outside of hospital". The potential savings and contribution of reducing avoidable admissions towards a sustainable healthcare system are tremendous.

615 The Steering Committee notes that HA has embarked on many initiatives to reduce avoidable admissions over the past few years. For example, outreach services have been extended to old age homes through the Visiting Medical Officers Scheme and the Community Geriatric Assessment Service to facilitate proactive care management of elderly patients before deterioration in their conditions. The Steering Committee also appreciates that HA has given great impetus to facilitate the development of 24-hour primary healthcare services as an effective way to maintain population health and reduce service demand in the public hospital system in recent years.

616 Based on available evidence, the Steering Committee recommends HA to implement the following two initiatives:

a) Establishment of Emergency Medicine Wards

617 The key aims of establishing Emergency Medicine (EM) wards are to reduce avoidable admissions into clinical departments and rationalize hospital inpatient services at night. The EM wards, run by Emergency Physicians conducting multiple ward rounds, provide quick and specialist-led services as well as multi-disciplinary care for patients[6.2]. They depart from the conventional "wait-and-see" approach in the Observation Wards of Accident & Emergency Departments in public hospitals and adopt a "treat-and-review" system supplemented by new clinical protocols in patient management. They have quick access to a wide range of sophisticated investigations and the setting is particularly suitable for managing conditions like respiratory diseases, circulation problems, limbs and movement problems, etc.

618 This is how an EM ward would operate: On attending the Accident & Emergency Department, patients are first assessed and stabilized. Those who need not be admitted would be discharged right away while others with clear diagnosis would be admitted into specialty wards direct for continual care. For example, patients with acute myocardial infarction or acute stroke would be admitted into the Coronary Care Unit and the Acute Stroke Unit respectively. Patients who can potentially be discharged within 48 hours would be admitted into the EM ward for further management. Moreover, patients with stable conditions may also be admitted into an EM ward at night in hospitals which do not have 24-hour provision of a particular specialist service, like Neurosurgery.

619 Literature has shown that short-stay units, such as the EM ward, have the potential to reduce patients' length of stay, improve the efficiency of emergency departments and improve cost effectiveness[6.3]. Patients may stay in the EM ward for up to 48 hours for integrated care. Since their conditions are expected to improve within a short period of time, admissions into other specialties are thus curtailed, along with reduction in clerking activities for patients in the wards. The benefit of EM ward is most evident during the night when staffing is reduced in the hospital. EM ward was first piloted in Queen Elizabeth Hospital in 2005 and the initiative was extended to Tuen Mun Hospital and Pamela Youde Nethersole Eastern Hospital in the first half of 2007.

6.2 Multi-disciplinary care under Emergency Medicine ward service involves physiotherapy, occupational therapy and medical social workers, etc. to provide appropriate care for patients' clinical conditions and social problems.

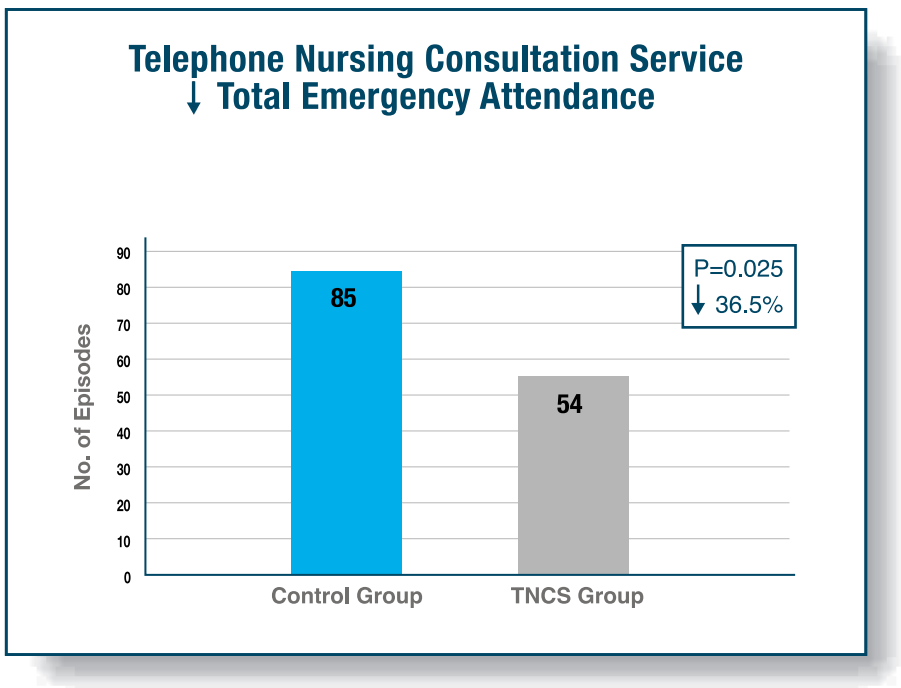
6.3 Short-stay Units and Observation Medicine: A systematic Review, The Medical Journal of Australia, 2003, 18(11):559-563

b) Telephone Nursing Consultation Service

620 Telephone Nursing Consultation Service (TNCS) is another initiative aimed at reducing avoidable admissions. It is in essence a virtual nurse clinic that seeks to form a network among clusters to support a wide range of post-discharged elderly patients at home (or even patients in elderly homes). TNCS is protocol-driven and clinical pathways for common diseases are formulated to ensure uniformity of standards, service and training as well as quality control for ultimate accountability. Besides, the service takes the advantage of new technology and a tight organizational structure and has operated single centres in the United States and Australia to provide pre-emergency triage for more than 10 million clients.[6.4] The TNCS network, when fully developed, can be used to provide initial assessment and triage of elderly patients who intend to attend the Accident & Emergency Departments for various symptoms and conditions. The Steering Committee understands that the nursing profession will be faced with manpower shortage in the coming years but yet extension of TNCS should be the right way forward.

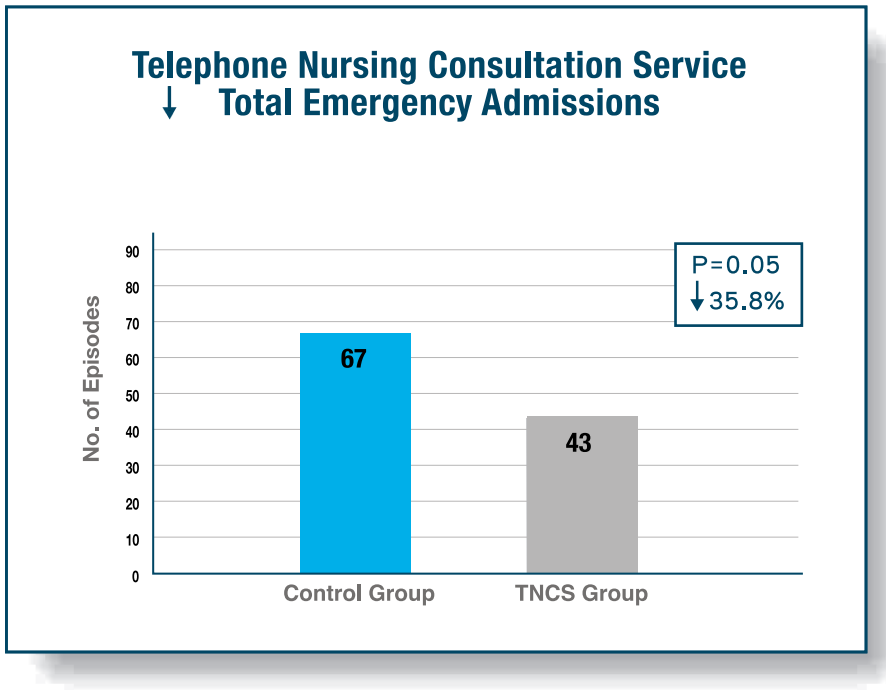
621 The efficacy of TNCS in reducing avoidable emergency attendance and admissions is well demonstrated in a local case-controlled study undertaken by the Hong Kong East Cluster in end 2005 / early 2006, where it was found that the total emergency attendances and admissions of elderly patients receiving TNCS were just two-thirds of those receiving the conventional community support. The Steering Committee believes that TNCS is an innovative mode of service which HA may consider exploring for further roll-out to other hospital clusters in order to effectively reduce the service volume in HA hospitals (Figures 6.2 & 6.3).

(Fig. 6.2)



6.4 Source: Cluster Chief Executive, Hong Kong East Cluster, Hospital Authority, Oct 2007.

(Fig. 6.3)



622 As highlighted above, both Emergency Medicine wards and Telephone Nursing Consultation Service are effective means to reduce avoidable admissions. The Steering Committee supports further roll-out to other hospital clusters. However, care to be delivered in the EM wards and under TNCS must be protocol-based, supported by a sound referral system coupled with prudent patient screening so as to ensure the quality of service and effectively reduce avoidable admissions in due course.

The Steering Committee's Recommendations

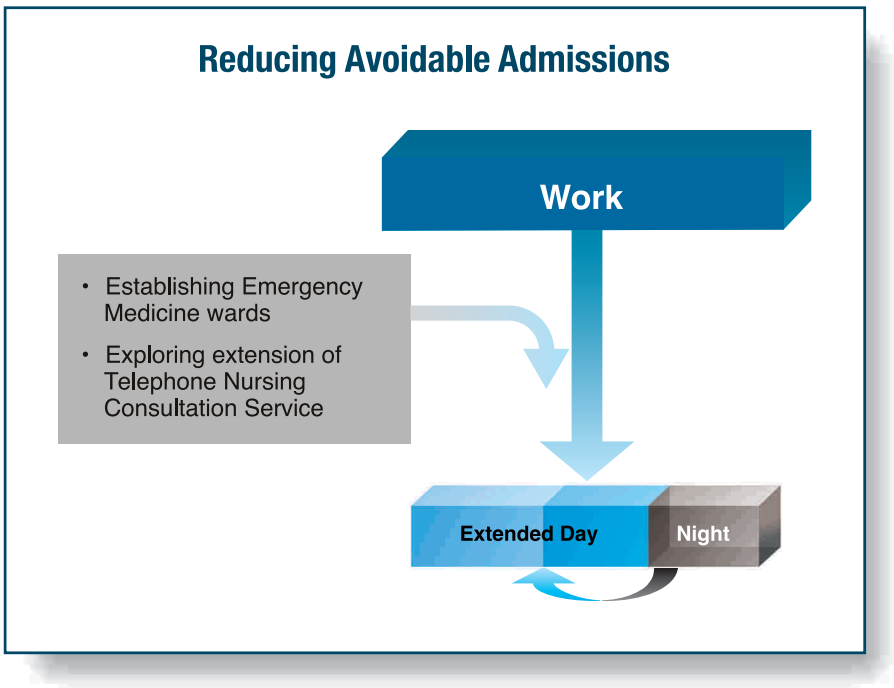
623 The Steering Committee recommends HA to implement the following measures in order to reduce avoidable admissions and optimize night activities in clinical departments:

a) To establish **Emergency Medicine wards** in selected acute hospitals with 24-hour Accident & Emergency services – This will be supplemented by prudent admission screening plus all necessary care protocols and clinical pathways for all concerned specialties

b) To explore extending **Telephone Nursing Consultation Service** to all hospital clusters

624 The above recommendations can be summarized in Figure 6.4 below:

(Fig. 6.4)



(II) Enhancing Public-private Interface

625 Apart from inpatient services, public hospital doctors are heavily engaged in specialist outpatient consultations and ward follow-ups. To curtail the overall volume of service and continuous work hours of doctors in public hospitals, the Steering Committee proposes to employ part-time private practitioners, through a contemporaneous Flexible Employment Strategy, with the aim of relieving the outpatient workload and enabling serving HA doctors to concentrate on their core medical and inpatient care services.

626 Under this proposed initiative, part-time private practitioners will be employed to take up a certain number of specialist outpatient sessions and handle a specified minimum of selected cases at a pre-determined rate of remuneration. The initiative will be rolled out to those specialties where doctors' average weekly work hours are consistently over 65. This initiative is expected to relieve 10% – 20% of the current excess workload of HA doctors and leave the remaining doctors' work hour deficits to be addressed by other reform strategies. Since patients will be offered more choices of healthcare services under this initiative, it may also help off-load some specialist outpatient cases from public hospitals to the private sector.

Consultation: Feedback from Respondents

627 There was general support for the proposed initiative to employ part-time private practitioners which has the desired effect of enhancing public-private collaboration in reducing the workload of specialist outpatient clinics. The Hong Kong Women Doctors Association supported this new part-time employment proposal which allowed the needed flexibility to cater for the personal preferences of doctors and the operational needs of various specialties or departments. To facilitate rollout of the initiative to different clusters, respondents suggested formulating a central policy on recruitment of private practitioners. It was also suggested that greater promulgation among patient groups was required, as was more strenuous facilitation of patient referral to the private sector, e.g. by enhanced information technology support like the Electronic Health Record System. These would definitely smooth out the operation of the proposed initiative and enhance the continuity of patient care.

628 The Hong Kong Academy of Medicine opined that, to ensure success of this public-private interface initiative, the scope and mode of operation of the whole proposal should be clearly defined and be transparent to both the private and the public sectors.

629 Some respondents were less optimistic of the efficacy of this proposed reform initiative. They queried why HA would not employ part-time practitioners from the pool of serving doctors. Other respondents proposed cross-cluster cover by serving doctors, with extra take-home pay, to provide locum service for busy specialist outpatient clinics.

The Steering Committee's View and Recommendations

630 The Steering Committee agrees with HA's key direction of developing seamless healthcare. There are ample opportunities of public-private collaboration, which the Steering Committee believes will empower patients in making choices, ease the workload of serving HA doctors, and ultimately alleviate the imbalance between the public and the private sectors.

631 Hong Kong has the potential to become the first in the world to offer its entire population access to an electronic health record. It is a great impetus to enable patients to seek service from the private sector. Facilitation of service networking and information flow will definitely help both the private sector and the patients. HA may consider expediting rollout and enhancing its Electronic Health Record System with strict control on personal data privacy and security so as to enable private practitioners to safely access and input patient data for the ultimate benefit of both health sectors in delivering quality healthcare services.

632 HA has endorsed the Flexible Employment Strategy in end July 2007 to create a more versatile workforce with an adjustable mix of full-timers and part-timers to bring in leading expertise from the private sector. Despite the frugal service budget, the Steering Committee is confident of the cost-effectiveness of employing part-time private practitioners as a means of sharing a certain proportion of HA's patient activities with the private sector.

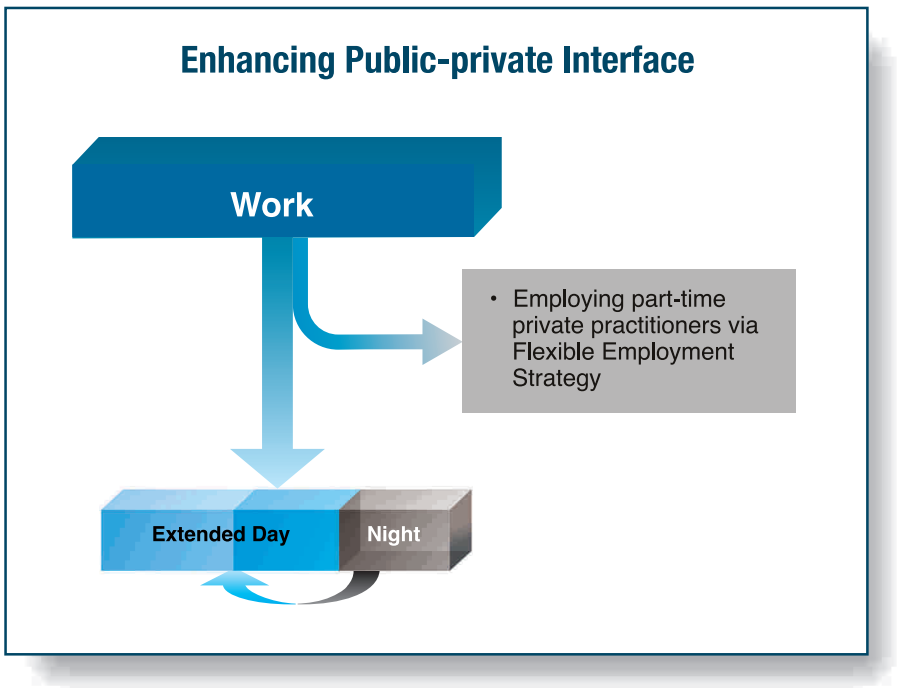
633 Concerning the source of supply of part-time medical practitioners, the Steering Committee holds that employing serving HA doctors, while having the benefits of system familiarization, has the potential for abuse. Cross-cluster cover part-time service may be a feasible option, but it will be subject to the limitations of average weekly and continuous work hours of serving HA doctors. On balance, the Steering Committee believes that appropriate remuneration will need to be offered to attract private practitioners to provide part-time service in public hospitals.

634 To sum up, the Steering Committee recommends HA to adopt the following option of public-private interface with a view to reducing the total workload and work hours of HA doctors:

a) To **employ part-time private practitioners** through a contemporaneous Flexible Employment Strategy – These part-time doctors will help out in specialist outpatient clinic sessions and take up part of the doctors' workload in certain overstretched departments.

635 The above recommendations can be summarized in Figure 6.5 below.

(Fig. 6.5)



Strategy A2 – Treat-and-transfer among Hospitals

636 To maximize the use of scarce professional resources, optimize doctors' workload and protect their training while ensuring quality patient care and safety, the Steering Committee advocates two reform initiatives, namely, concentrating selected emergency admissions into tertiary hospitals and concentrating highly sophisticated services into a few centres in the direction of "treat-and-transfer" of patients at the cluster level.

(I) Concentrating Selected Emergency Admissions into Tertiary Hospitals

637 This initiative is about delineating roles of hospitals as well as primary and secondary diversion of emergency cases within a hospital cluster. Under this care model, selected emergency admissions would be diverted to tertiary hospitals for management during certain hours in a day, for instance, at the night time. Primary diversion of trauma patients is an example.

638 If a patient attends a secondary hospital for an emergent medical condition, he / she would be treated according to the availability of expertise in the hospital. The patient would be transferred to the tertiary hospital in the cluster for further management if the required level of expertise is not available in that secondary hospital. Treat-and-transfer of patients, as secondary diversion of cases, is also required whenever a provisional diagnosis is established and the level of expert care required exceeds that available in the first hospital.

Consultation: Feedback from Respondents

639 There were real concerns over patient access to emergency services in the district, continuity of care and patient safety in the course of patient transfer, and reduced training opportunities for doctors arising from this proposed reform initiative. Some respondents expressed that a treat-and-transfer policy was crucial, as was development of Escort Medicine Teams. The Hong Kong College of Orthopaedic Surgeons supported this strategic initiative as the resultant surplus workforce could be deployed accordingly. Yet, some doctors expected resistance from smaller-size general hospitals and the community; and the programme should be rolled out delicately with political precision. HA was suggested to clearly promulgate the arrangement and solicit buy-in of all concerned staff, hospitals and members of the general public in order to make the initiative a success.

The Steering Committee's View and Recommendations

640 The benefits of this mode of operation and its impacts on patient safety / access are best exemplified by two recent evidence-based reports published in the UK. These reports have rightly pointed out that complex treatments are better delivered by highly-trained staff at specialist centres, rather than spread thinly around local facilities[6.5]. For instance, patients would be better treated at specialized heart and stroke units rather than a local hospital, even if it means a longer journey, because patients would get swifter and more specialized treatment. Moreover, by giving life-saving drugs to heart attack victims on their doorstep and using clinical judgments to by-pass the local hospital to deliver heart attack and stroke patients directly to specialists, the medical profession is in fact acting in the best interest of the patients. This is not driven by saving money but by the aim of saving lives. As the evidence for many common but highly dangerous conditions is becoming clearer, this will probably drive further reconfiguration of services, and it makes sense to create networks of care with regional specialist centres so as to provide the best possible treatment for the critical patients.

6.5 The reports are written by Sir George Alberti, National Clinical Director for Emergency Care, and Prof Roger Boyle, National Clinical Director for Heart Disease and Stroke and accessible at http://www.timesonline.co.uk/tol/news/uk/health/article660474.ece.

641 The Steering Committee agrees that this mode of operation is effective and will bring about benefits to patients by enhancing patient access to complex treatments in a comprehensively supported place with better facilities. It is a practical service model that the Steering Committee believes will be well received by the community. Moreover, as caseload and expertise are pooled together, the number of on-site calls for doctors, hence their work hours, will be reduced. It is also beneficial to doctors as it allows greater concentration on core services and professional training for more sophisticated skills.

642 Flexibility as to (1) the time of diversion within a day and (2) the scope (i.e. specialties) should be allowed and further explored by the hospitals in the cluster. For instance, one hospital may adopt 24-hour diversion of all surgical emergency admissions into another hospital. On the other hand, there are situations where certain hospitals have limited-hour specialist services at daytime only. In that case, patients will be managed by specialists during the day and then taken care of in the Emergency Medicine ward at night, if their conditions are stable, pending further specialist assessment on the next day. However, should critical patients require hospitalisation for urgent specialist management which is beyond the expertise available in the first hospital, they will be transferred to the designated centre in another hospital for round-the-clock specialist care. This is an example of out-of-hour instead of 24-hour diversion.

643 To ensure continuity of care and patient safety during transfer, a dedicated and trained Escort Medicine Team, supplemented by well-deliberated care protocols and transfer guidelines, has to be developed for transfer of stabilized critically-ill patients to the specialist centres. The positive clinical outcome of Escort Medicine is well supported by literature and local studies. The UK experience indicates that safe inter-hospital transfer of critically-ill patients is feasible[6.6], and long-distance inter-hospital ground transfer of even critically-ill patients with severe unstable respiratory and circulatory failure is safe if a dedicated transport team and a specially-equipped transport vehicle are used[6.7]. From what the Steering Committee has learnt from the New Territories East Cluster, Escort Medicine can be a successful initiative, given proper training of doctors and nurses, well-planned triage guidelines, good compliance with the Inter-facility Patient Transfer Core Manual as well as availability of night nurse escort service at the Accident & Emergency Department, which are being put in place in phases.

(II) Concentrating Highly Sophisticated Services into a Few Centres

644 This initiative entails service networking among clusters and hospitals. The Steering Committee is well aware that it is prerequisite for some sub-specialties to concentrate cases for expertise development on the one hand, and to ensure equitable and timely access to highly sophisticated services on the other.

6.6 British Medical Journal, 1990 Jan 13;300(6717):85-7

6.7 Intensive Care Med. 2002 Aug;28(8):1122-5

Consultation: Feedback from Respondents

645 The Hong Kong Academy of Medicine suggested that a dedicated "Flying Squad" be established for "Centres of Excellence" where critically-ill patients would be transferred to receive the best care. The Academy considered that doctors and nurses should not be deployed from the clinical units / hospitals for such purpose.

646 The Hong Kong College of Orthopaedic Surgeons supported this initiative. It expressed that contemporary orthopaedic surgery was technology dependent and the local profession might soon be marginalized if the necessary new technology was not developed and provided in the selected centres.

The Steering Committee's View

647 In the HA-wide communication sessions conducted in the past months, the Steering Committee has gained valuable insights from line departments on the service mode of different specialties in delivering equitable and quality care without compromising doctors' professional training. The following examples in Neurosurgery and Paediatric Surgery well illustrate the Steering Committee's view in the light of the current situation in these surgical sub-specialties.

Neurosurgery

648 Previous local studies revealed that night-time activities were sporadic in Neurosurgery, with fewer emergency admissions as compared with other specialties. It was not uncommon for 3 – 4 doctors in Neurosurgery to take turns for overnight on-call duties, with each doctor taking on 7 – 10 calls a month and more than 75 hours of work in a week. The initial thought of the Steering Committee was that there should at least be one on-site Neurosurgery Resident in each of the trauma centres to provide round-the-clock service for patients. Given the workforce issue, employing extra Residents for trauma centres would apparently be a viable solution to reduce the weekly work hours of doctors in Neurosurgery.

649 The Steering Committee, however, is given to understand that the current workforce in Neurosurgery (about 76 doctors at the time of writing this report) should be within the international acceptable level (i.e. 1 Neurosurgeon per 125,000 population) to cater for about 7 million population in Hong Kong. The Steering Committee also notes that the College of Neurosurgeons admits only 2 higher trainees per year. Hence, simple allocation of extra doctors to the pool with a view to attaining the 65-hour week may dilute the direct hands-on experience of the trainees in managing neurosurgical patients. This may not be well received by clinical leaders in the specialty. Moreover, from the lessons in the UK, the Steering Committee has learnt that addition of doctors as a means to curb work hours will eventually lead to a dilemma in career progression, as more junior doctors will compete for a limited number of senior posts. Given the complexity of the above interlocking factors, the Steering Committee believes that alternative solutions need to be sought to address the doctors' work hour issue in Neurosurgery.

650 There have been long deliberations on re-organizing the cluster-based Neurosurgical services into four service networks, taking advantage of the extensive transport networks in Hong Kong as compared to other metropolises. The experience of the Royal Liverpool University Hospital in the UK shows that it is not mandatory to have a resident Neurosurgeon to provide on-site service round-the-clock in the trauma centre. Patients with head injuries may first be stabilized in the receiving hospital with brain imaging done before transfer to the designated neurosurgical centre, and the resident Neurosurgeon there will be reading the images through tele-radiology before the patients arrive for necessary treatment. In this perspective, it appears a logical solution to pool the scarce expert resources and concentrate technology, facilities and patients into a few centres, so as to enhance the overall service efficiency and effectiveness and reduce the average weekly work hours of doctors under an expanded pool of on-call doctors.

Paediatric Surgery

651 Unlike Neurosurgery, Paediatric Surgery has already been clustered into three networks serving seven hospital clusters and the whole territory. Yet, its workforce provision is much less than the international standard. At present there are only 10 HA specialists and 3 University staff (1 being on fractionate appointment). In other words, the per-capita ratio of Paediatric Surgeons is 1 to 597,800 (or 1 to 544,000 if the University staff is counted full-time). By contrast, the per-capita ratio in overseas countries range from 1 to 133,000 in Japan to 1 to 500,000 in the USA[6.8]. Although the ratio is comparable to that in the USA, the local Paediatric Surgeons play a major role in attending paediatric urological patients with cleft defects and gastroenterology conditions. Securing sufficient manpower to fill the present manpower gap seems to be a viable solution while further grouping of the 3 service networks in the long term will be another to address the issue of long work hours of Paediatric Surgeons.

652 From the above analyses on Neurosurgery and Paediatric Surgery, it is evident that service networking will benefit both patients (who have access to the finite number of experts in the field) and the medical workforce (since the caseload will be concentrated into one or a few centres for betterment of doctors' training in these highly specialized areas). To attain greater benefits, HA may consider further deliberating the scope and pace of service rationalization and networking and lead changes in these directions.

The Steering Committee's Recommendations

653 In relation to the treat-and-transfer mode of service, the Steering Committee recommends HA to consider:

a) defining the **roles and scope of service** of different hospitals in each cluster (acute vs non-acute) in order to optimize patient access to emergency services currently provided by a limited number of HA doctors,

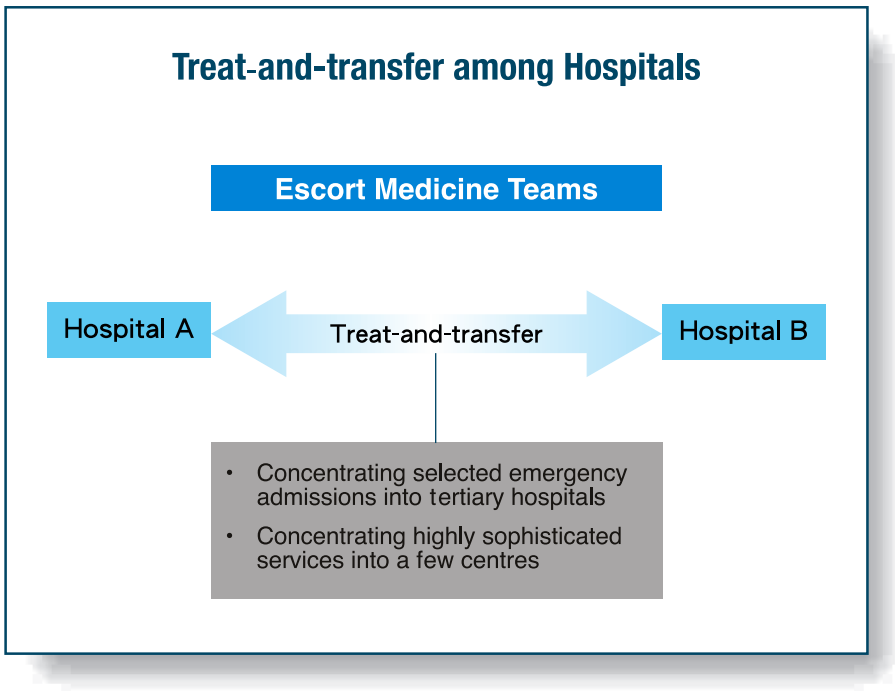
6.8 The per-capita ratio of Paediatric Neurosurgeons is 1 to 250,000 in Australia, 1 to 300,000 in the UK, 1 to 370,000 in Taiwan and 1 to 420,000 in Singapore, to name a few examples.

b) establishing **Escort Medicine Teams** in different clusters in phases, with all necessary care protocols and transfer guidelines to support treat-and-transfer of stabilized critically-ill patients, and

c) forming **service networks** for certain clinical sub-specialties across clusters and setting up task forces to formulate a clear timetable for service networking.

654 The above recommendations can be summarized in Figure 6.6 below.

(Fig. 6.6)

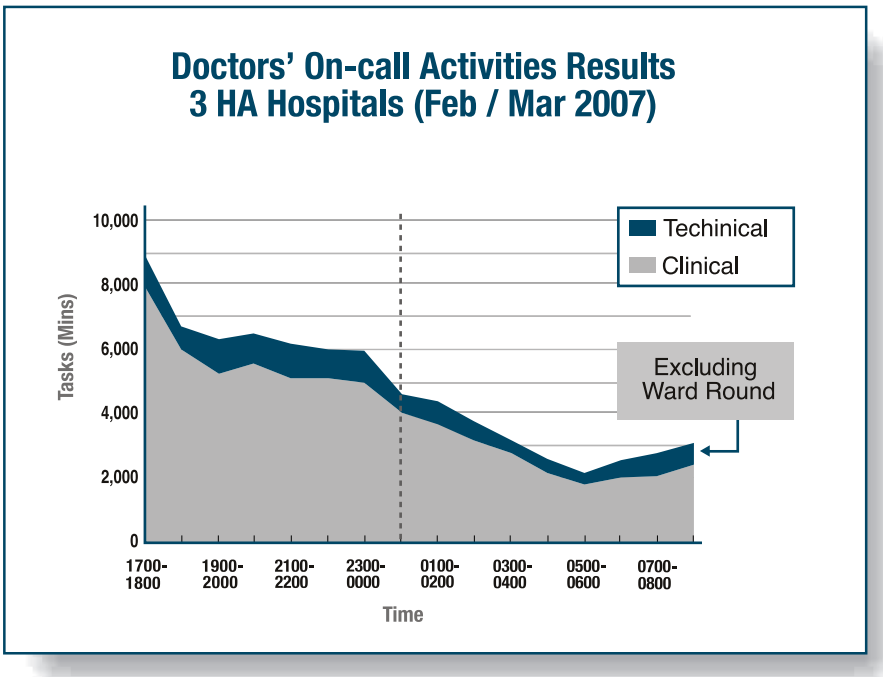


Strategy A3 – Optimizing Night Activities in All Hospitals

655 Local surveys on out-of-hour doctors' on-call activities conducted in 2006 showed that the level of activities was generally high in the evening but fell after midnight[6.9], a trend which displayed great resemblance to similar surveys in the UK public hospitals. Furthermore, the number of on-call tasks related to life-threatening and normal conditions out-of-hours was also similar in both Hong Kong and the UK, as were tasks that were more technical in nature and could be taken up by trained non-medical staff. Yet, these work patterns might not be fully reflected in the current out-of-hour staffing level in different clinical specialties of HA hospitals (Figure 6.7 & Table 6.1).

6.9 The resembling trend between Hong Kong and the UK in out-of-hour on-call activities does not apply to Neurosurgery, Obstetrics & Gynaecology as well as Paediatrics.

(Fig. 6.7)



(Tab.6.1)

Doctors' On-call Activities Results

Finding:

- **Similar to UK Pattern**

Activities	A	B	C	Overall	UK
Tasks related to life-threatening conditions	4%	5%	6%	5%	7%
Tasks related to normal patient conditions	26%	30%	40%	35%	31%
Tasks that could be taken up by trained non-medical staff	13%	12%	18%	16%	Appro-ximately 20%

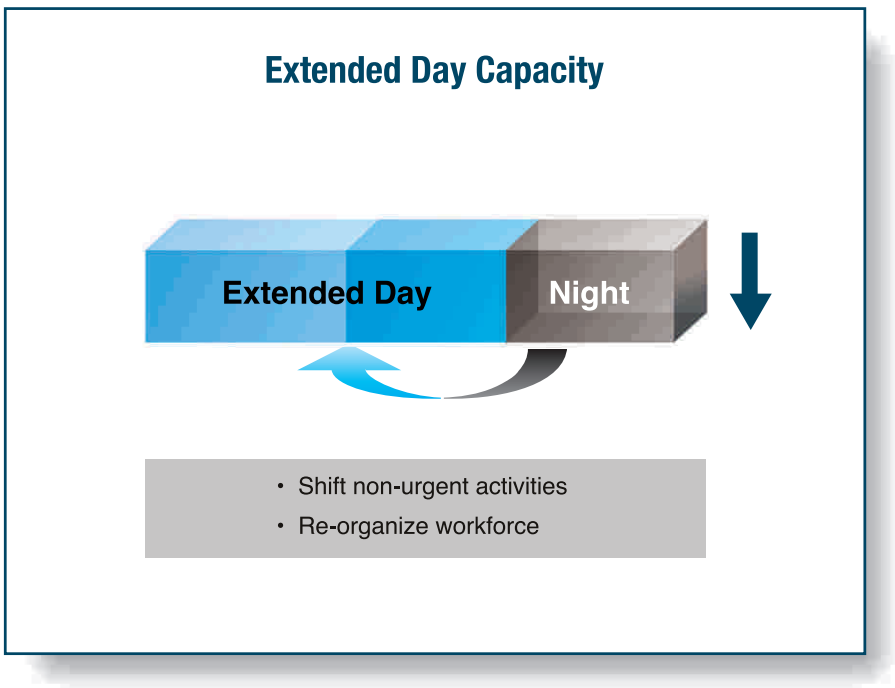
656 Patient care at night carries additional pressure and higher risk due to scattered staffing and decreased paramedic support at night. On the one hand, moving out-of-hour workload to the extended day can reduce night-time intensity and render safer patient care. On the other hand, reduction of night activities provides room for optimizing the number of overnight on-site doctors required and consequently curtails their long weekly work hours as a result of the reduction in on-site call frequency.

657 This optimized night model should be complemented by the following initiatives:

(I) Extended Day Capacity

658 Under the current doctors' work flow in HA hospitals at night, there is a backlog of activities which cannot be finished during the ordinary daytime operation. The Steering Committee advocates a conceptual shift from day-night activities to a new mode of extended-day and optimized night services, that is, to draw non-urgent night activities to the extended day with better staffing and facility support and to re-organize the scarce professional resources, so that adequate staffing is ensured to cope with service demand in the extended day (Figure 6.8).

(Fig. 6.8)



Consultation: Feedback from Respondents

659 Frontline doctors' concerns over the extended day model were two-fold. Firstly, as doctors needed to attend specialist outpatient clinics at day time, difficulties might be encountered in handling the extended day duties. Pressure would be generated for middle-ranking doctors and suggestions were thus made to cap the day-time activities so that clinicians could better handle the extended day duties.

660 Secondly, strengthening of paramedic support was equally important to the extended day model. Doctors were concerned about the stringent staffing for manning extra operating theatre sessions in the evening. Some respondents suggested employing locum staff to support the evening and weekend sessions.

661 The Hong Kong Academy of Medicine held that night activities in Obstetrics, Neonatology and Paediatrics could not be reduced. The Academy urged HA to closely monitor the standard of service, quality and patient outcome should service delivery be changed to the extended day model.

662 The Hong Kong College of Orthopaedic Surgeons supported the concept of extended day work as it could avoid inefficient work at night and might rectify the current situation where some non-life or limb threatening cases had to be operated during the small hours of the day, which was not fair to all concerned. With the extended day capacity, the College believed that it could avoid conflicts between patients and the Orthopaedic Surgeons.

The Steering Committee's View and Recommendations

663 The Steering Committee takes the frontline doctors' view that there would be higher intensity of work in the evening. Strengthening the extended day capacity could optimize the out-of-hour workload and ensure adequate training opportunities for doctors at day-time. To this end, the Steering Committee recommends HA to consider strategically deploying extra resources to pressure areas on a need basis. However, HA may also consider embarking on other reform initiatives, elaborated in the ensuing sections, and making necessary staffing arrangements to better manage both day-time and out-of-hour activities.

(II) Restricting Emergency Operations after 22:00 Hours

664 To attain an optimal workload for doctors at night, the Steering Committee recommends opening additional operating theatre sessions in the extended day in acute hospitals and restricting emergency operations after 22:00 hours to life, limb and sight-threatening cases only. This initiative will go along with more flexible deployment of workforce and reshuffled work arrangements in the concerned specialties and nursing departments in order to cope with the surge demand in the extended day.

665 Healthcare professionals performing operations at night are more prone to fatigue, thereby rendering patient care at risk. An overseas study reported that the relative risk of dural puncture during an epidural procedure was 6 times higher when it was conducted at night[6.10]. Another study on laparoscopic surgery also indicated that related procedures, commonly performed during and after hours, might put surgeons at risk of fatigue and injury[6.11]. More errors were prone to occur in cases associated with extremes of age, complex care, urgent care and prolonged hospital stay[6.12]. These situations are most common in local operating theatres and similar experience may be encountered in surgical procedures performed at night.

6.10 Gander PH, et al. Hours of work and fatique-related error: a survey of New Zealand anaethetists. Anaesth Intensive Care 2000;28:178-83

6.11 Uhrich ML, et al. Surg Endosc 2002;16:635-9

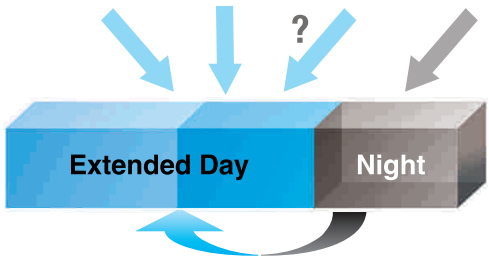
6.12 Ava AG, et al Can J Anaesth 1999;46:665-9

666 From an operational point of view, the existing work pattern also justifies re-arrangement of operating theatre sessions in public hospitals. General emergencies at night are not common and operations performed around midnight or in the small hours of the day are partially due to backlog of semi-urgent cases not completed during the day. On-site doctors and theatre nurses are sometimes under-utilized at night. The phenomenon is revealed in a retrospective study of emergency operations (e-OT) performed in 2 HA district hospitals in November 2006, where it was found, as shown in Figure 6.9, that 36% to 55% of the cases could be drawn to the extended day if operating rooms were available. Besides, 14% to 19% of the cases could be operated in the next morning while 4% to 11% of the cases involving life, limb and sight-threatening conditions needed immediate surgical intervention at night. The other cases involved mostly peritonitis. Whether these operations needed to be performed urgently at night would depend on the clinical conditions of each case and judgment of the clinicians concerned.

(Fig. 6.9)

Nature of Operation at Night (Nov 2006)

District Hospital	Total e-OT Performed (2200–0830)	Backlog Before 2200	Performed in Next Morning	Other Cases	Life, limb & Sight-threatening Cases
A	22	8 (36%)	3 (14%)	10 (46%)	1 (4%)
B	27	15 (55%)	5 (19%)	4 (15%)	3 (11%)



Consultation: Feedback from Respondents

667 The Surgeons were concerned about patient safety and subsequent deterioration in patient conditions if non-emergency operations were restricted at night or deferred to the early morning. Some respondents considered the initiative a cost-cutting tactic while others advocated injection of more resources to ensure adequate patient services in the extended day, since the current daytime theatre sessions had already been fully utilized. Some respondents were worried about the efficacy of the reform and suggested that further studies be conducted in order to prove that restricting emergency operations at night could genuinely address doctors' workload and enhance patient safety.

668 The Hong Kong College of Orthopaedic Surgeons welcomed the initiative and proposed that a designated trauma operating list be assigned to all Orthopaedic departments supporting 24-hour emergency services. Some Orthopaedic Surgeons requested for extending the restricted list of emergency operations at night to include open wound management and operation on threatened neurological functions of limbs as well.

The Steering Committee's View

669 Restricting emergency operations at night is not about cutting service or saving resources, but for safer operating conditions and better use of the scarce professional resources. The Steering Committee is open to any proposal for restricting emergency operations at night and envisages that the restricted list of operations may evolve over time. In any case, whether an operation should be performed urgently at night remains a matter of clinical judgment and depends very much on the merits of each case.

670 From the UK experience, it is clear that reducing night-time operations can minimize operating risks and reduce the number of overnight on-site doctors required. Apart from the fatigue factor associated with night-time operations, there is also less clinical supervision and less support for unpredictable patient complications at night. Thus, re-scheduling non-emergency operations until the next day when operating theatres are better furnished with staffing and facilities will improve patient safety, while opening more elective theatre sessions for patients in the evening (extended day) can actually shorten the waiting time. Training of junior doctors can be strengthened with closer supervision during the daytime and, from the UK experience, the frequency of call upon middle grade surgical staff can also be reduced.

671 Theatre sessions are a good training ground for the surgical stream of junior doctors. While there is still room for reshuffling the staffing level and redesigning anaesthetic cover to cater for this new service model, appropriate resources should be deployed to increase the staffing support for the additional theatre sessions opened in the evening. Moreover, extra staffing could be secured by employing part-time private practitioners through the Flexible Employment Strategy. This will create a quadruple win-win situation for patients, the dedicated doctors, the private sector and the entire organization.

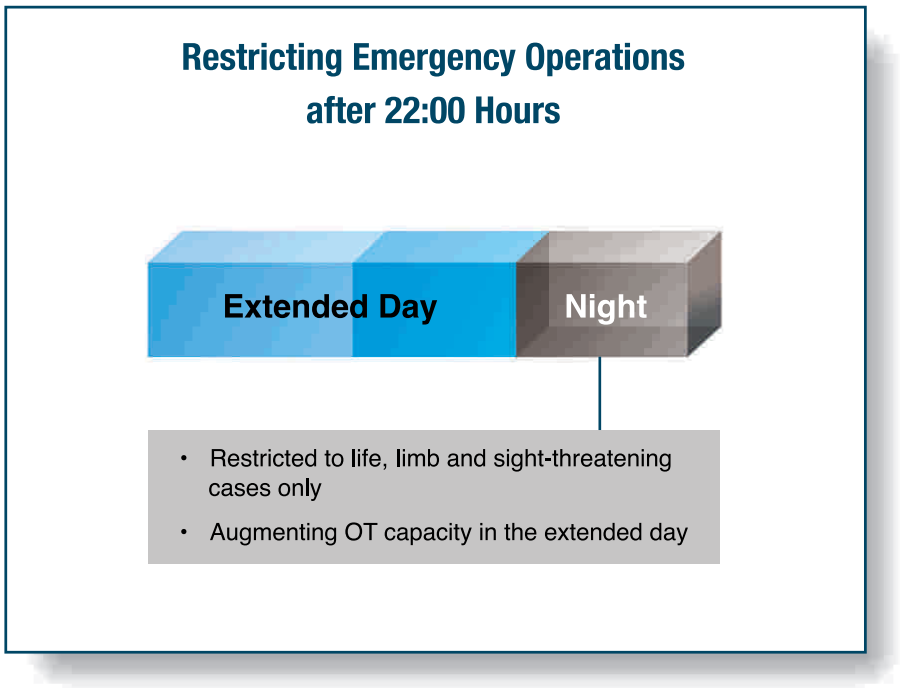
672 To optimize the use of limited resources and ensure adequate service access for patients, supplementary measures like primary trauma diversion should be implemented in all clusters as appropriate, so that trauma patients can access immediate and necessary surgery if clinically indicated. This again involves redefining roles of hospitals and specialties. HA may consider deliberating further in this direction.

673 Finally, continuous compliance monitoring and periodic patient outcome evaluations are required in order to assess if the reform yields the intended results without compromising the quality of doctors' work and training while ensuring patient care and safety.

The Steering Committee's Recommendations

674 The Steering Committee recommends HA to **restrict emergency operations after 22:00 hours** to life, limb, and sight-threatening cases only, coupled with an **expanded operating theatre capacity** in the extended day on weekdays in all hospital clusters. The above recommendations can be summarized in Figure 6.10 below.

(Fig. 6.10)



(III) Extending the Roles of Non-medical Staff

675 In a recent survey on on-call activities in a hospital cluster, it was found that as much as 16% of doctors' work at night was dedicated to technical tasks and mundane activities that did not necessarily require their level of skill, such as performing venipuncture, intravenous cannulation, electrocardiogram recording and searching for x-ray films, etc. These tasks would lengthen doctors' work hours and significantly affect discharge of their core clinical duties for the patients. Overseas data indicated a similar pattern (please refer to Table 6.1 above) and showed that reduction in multiple clerking, better administration and other support for medical staff would reduce their workload by a certain extent at night. In the local context, appropriately trained non-medical staff, like care technicians or other paramedical staff, can also take up some of the technical activities in wards that are traditionally taken up by the frontline doctors. It is expected that a comprehensive system of technical support would ease doctors' workload and reduce the number of on-site doctors required at night.

Consultation: Feedback from Respondents

676 Since the more technical tasks and routine procedures currently performed by doctors could be partly taken up by other grades of staff, the latter would play a very important role in the delivery of quality patient care services. The nursing management articulated the enhanced professional roles of nursing practitioners in the corporate Doctor Work Reform; and the current stringent nursing workforce should not be a blockage to this future development. Some nursing colleagues called for greater career advancement by opening more senior nursing positions to take on enhanced responsibilities while others raised the need for more assistance, including year-round support by ward stewards in wards with high patient dependency and turnover as well as extended pharmacy support for A&E departments and medical admission wards. This would ease the workload of doctors and nurses and reduce the risk of medication errors. Moreover, it was suggested to introduce the individual patient dispensing system at ward level where prescription checking, drug dispensing and segregation of dispensed drugs into individualized patient compartments in the drug trolleys could be performed by pharmacists and dispensers, and nurses would perform the last step of drug administration. At a time when significant nursing shortage was expected in the foreseeable future, implementation of this system would markedly improve medication safety and allow the nursing staff to concentrate on their rightful job of leading the ward team in patient care.

677 On the other hand, some respondents urged HA to define the roles and training requirements of care technicians; and the nursing management was particularly concerned with the suitability and accountability of the care technicians in IV cannulation and saline flushing. There were also worries about the recruitment difficulties and high turnover rate of supporting staff like Phlebotomists. In the face of strong market competition, HA was suggested to formulate an attractive yet flexible remuneration package and career structure in order to recruit and retain well-qualified and dedicated staff in the public hospital system.

The Steering Committee's View

678 In the HA Convention 2006, the Chief Executive of HA talked about "right function, right skill". The Steering Committee certainly agrees that the entire organization should modernize the staff's role and responsibilities, take mundane tasks away from highly trained professionals and extend the scope of practice for trained staff into more specialized areas. The Steering Committee believes in the "skills escalator" process, where care technicians are trained to take on some less complex tasks carried out by healthcare professionals other than doctors, thereby freeing them to take on extended roles to carry out some less complex tasks otherwise performed by doctors. This has a positive impact on the career advancement of non-medical healthcare professionals and ease the workload of doctors so as to enable them to re-focus themselves on core clinical activities and engage in professional training, thereby improving patient care and safety. The Steering Committee welcomes the strong commitment of the nursing profession in support of the corporate Doctor Work Reform and considers it the right way to go for a modernizing profession, albeit the severe staff shortage in the meantime.

679 Currently, all hospital clusters have introduced Phlebotomists to collect blood samples in the clinical environment, though the service is often restricted to the daytime or in specialist or general outpatient clinics. Their skills can be extended through dedicated training to include blood taking from age 1 upwards, performing blood cultures, intravenous cannulation and electrocardiogram recording, etc. To maximize the benefits brought by this initiative, HA is recommended to employ more care technicians such that they can work round-the-clock and relieve the workload of doctors in both wards and clinics. However, in view of the nurses' concerns over the accountability and suitability of care technicians in performing IV cannulation and saline flushing, HA may consider putting in place a mechanism to ensure consistent and well-structured training programmes across the board to train up care technicians to support ward operation and provide basic patient care.

680 By the same token, HA may consider exploring the development of nurse clinics and extending the roles of other paramedics like pharmacists and allied health therapists in caring for the chronic patients. There is ample literature evidence to support this innovative mode of care delivery. HA is also recommended to study the potential benefits of enhanced pharmacist support in inpatient settings where drugs are used in high volume.

681 On the whole, re-designating the roles of clinical staff involves a cultural change and a revamped skill mix in patient care delivery. To ensure effective service delivery to patients, strong partnership needs to be built between doctors, nurses and allied health professionals working in the same team. Team members should possess strong core knowledge and skills in patient management, with continuous enhancement through dedicated as well as in-service training. Moreover, care protocols, handover systems as well as patient safety and risk management are all crucial elements to ensure the efficacy and efficiency of patient services under the optimized night model. To this end, the multi-disciplinary team also needs a common language in ward such as the MEWS (i.e. Modified Early Warning Score) used in the UK to identify critical patient conditions for timely specialist intervention. Patient care should be competency-based and protocol-driven, supplemented by appropriate staff training and regular assessment of staff competence, so that the quality of patient care can be upheld with continual enhancement.

The Steering Committee's Recommendations

682 The Steering Committee recommends HA to implement the following measures in relation to the extended roles of non-medical staff to relieve the workload of doctors under the extended day and optimized night model:

a) HA may consider enhancing the professional role of nurses in the patient care process and planning for provision of **24-hour care technician service** to carry out blood-taking, intravenous cannulation, electrocardiogram recording and / or other activities as appropriate, so as to allow on-site doctors to re-focus their time on core clinical decision making and communication with patients and their relatives. The duties of care technicians may evolve over time to meet operational needs.

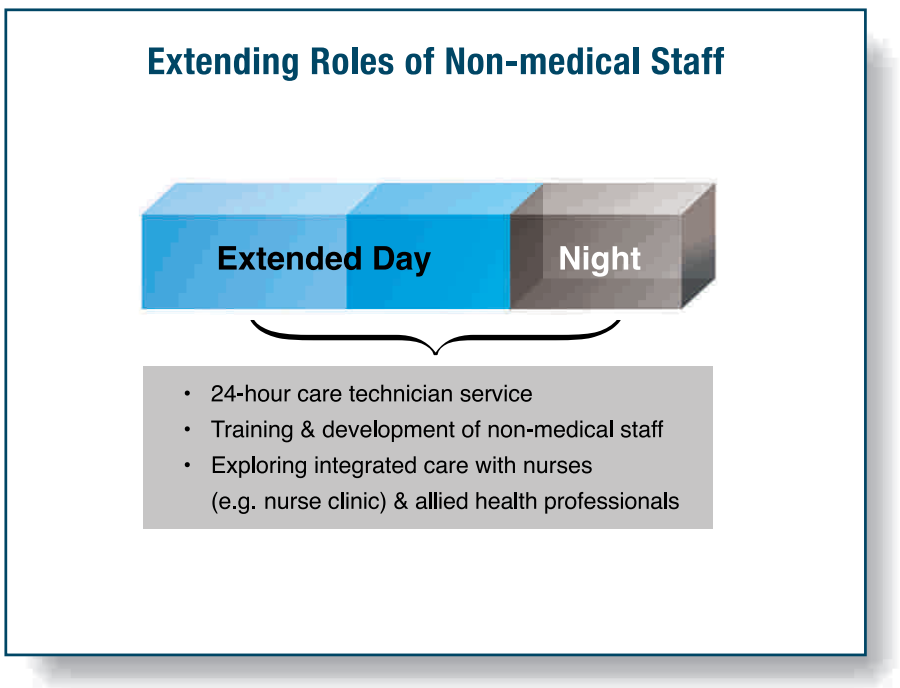
b) HA may consider strengthening the training and development of non-medical staff with extended roles in patient care. A mechanism may be put in place to ensure consistent training programmes across the board to train up competent care technicians to support ward operation and provide basic patient care. Care protocols may also be established to ensure patient safety and team partnership be reinforced to uphold the quality of patient services.

c) HA may consider exploring other means of integrated care, like nurse clinics, with enhanced support of non-medical staff and therapists in managing chronic patients and reducing the workload of doctors.

d) HA may consider studying the feasibility of extending the existing role of pharmacists to enhance medication safety in wards, identifying service gaps, if any, and quantifying the potential benefits of this initiative to ward operation and delivery of quality patient care.

683 The above recommendations can be summarized in Figure 6.11 below.

(Fig. 6.11)



(IV) Establishing Admission Wards

684 As an initiative to optimize doctors' workload and concentrate scarce professional resources to handle out-of-hour emergencies and clinical admissions, HA may consider exploring the establishment of admission wards on top of the Emergency Medicine Wards to handle acute admissions in the wider streams of medical and surgical services. Admission wards handle patients admitted from the Accident & Emergency Department for fast-track monitoring and treatment of defined medical or surgical problems. Special emphasis is placed on a robust ward-based programme of therapeutic activities and patients are aimed for discharge within 48 hours of hospitalization in the admission wards. If the 48-hour discharge target cannot be achieved, the patients will be transferred to other sub-specialty wards for further management. Admission wards are thus designed for cohort admissions and concentrated activities so as to reduce both hospital stay of patients and unnecessary exhaustion caused to overnight on-call doctors who may otherwise need to handle many emergency admissions at multiple sites within the hospital. In the UK, a few public hospitals now even admit medical, urological, surgical and orthopaedic emergencies into the same area to ease the workload of doctors.

Consultation: Feedback from Respondents

685 The Hong Kong College of Orthopaedic Surgeons supported the establishment of generic admission wards to take care of patients who would not require urgent attention of the Orthopaedic Surgeons, provided that the staffing in the admission wards would be additional rather than pooled from the existing Orthopaedics Departments. Certain doctors had reservation on the value of admission wards for surgical patients, since most nurses and supporting staff, being familiar with the routines of managing emergency patients, would encounter difficulties in caring for patients of other specialties, not to mention protocol-based care and the varied practices among different specialties. HA was suggested to review the outcome of the pilot programmes before planning for further rollout to other HA hospitals. The Hong Kong College of Paediatricians stated that paediatric patients should not be admitted into generic admission wards as they should be directly admitted into the paediatric wards for specialist care.

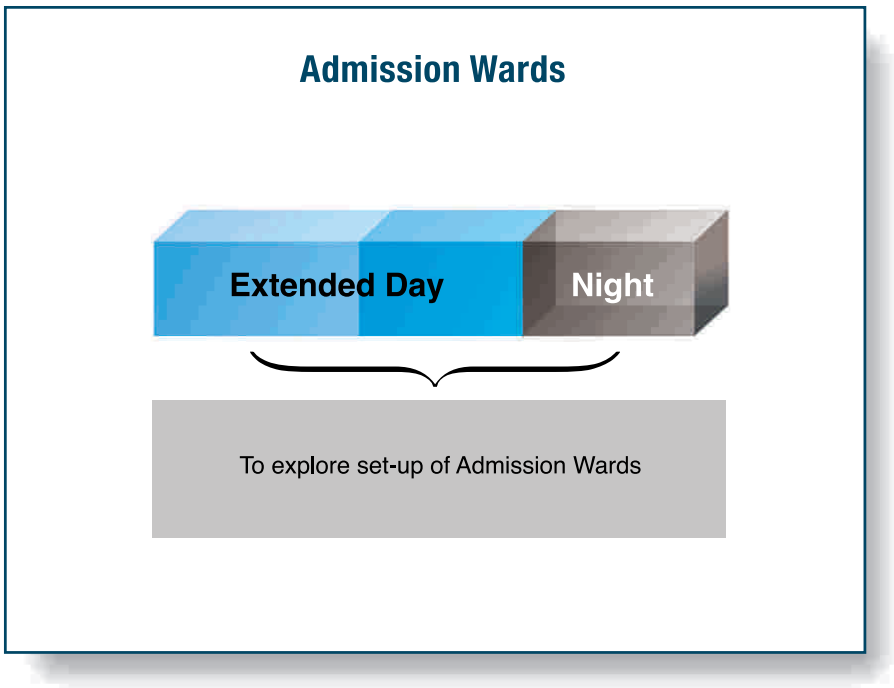
The Steering Committee's View & Recommendations

686 Resources are required to establish admission wards. To ensure smooth operation of the admission wards, clear protocols and clinical pathways should be formulated with input of both clinicians and nurses, who play a pivotal role in patient care. Proper bed management by ward staff is also essential to attain success of admission wards.

687 To sum up, the Steering Committee recommends HA to consider the role of admission wards and explore their potentials for concentrating resources and staffing to handle emergency admissions as per the prevailing conditions in different hospitals.

688 The above recommendation can be summarized in Figure 6.12 below.

(Fig. 6.12)



(V) Reinforcing Overall System Support and Efficiency

689 The extended-day model cannot stand on its own. In order to optimize night activities, ensure patient safety and reduce doctors' out-of-hour workload, HA may consider exploring more protocol-driven care and new technologies to enhance the overall system support. In the Doctor Work Reform consultation paper, it was proposed, following the consensus of participants in the Strategic Planning Workshop, that HA should explore the introduction of (a) 24-hour protocol-driven computerized tomography (CT) and magnetic resonance imaging (MRI) services for critically-ill patients, (b) tele-radiology for off-site consultation and (c) other options of mobile text and voice-communication tools. Development of a clinical decision support system, supplemented by electronic protocol documentation, patient information databases and clinical networks would also be worth considering in order to make the whole journey of multi-disciplinary care more effective in the long term.

Consultation: Feedback from Respondents

690 The Hong Kong College of Radiologists and the HA Coordinating Committee (COC) (Radiology) gave valuable comments on the proposed strategies. On the whole, the specialty was supportive to the reform, given adequate manpower, sufficient inducement, well-thought protocols and monitoring mechanisms, as well as gradual implementation of changes over time. However, it was pointed out that the whole radiology service had been facing acute staffing shortages and reduced training capacity for junior doctors in public hospitals. An extended day with round-the-clock imaging support would definitely increase the volume of CT and MRI examinations in and out-of-hours. This would

in turn displace the core radiology services, since staffing would be further stretched to both day and night, and sub-specialty training of junior doctors would be insufficient to meet service needs. There were also worries that extending out-of-hour activities could induce further brain drain of experienced staff. Expedited reform without corresponding workforce support would set in a vicious cycle and aggravate the problem to the detriment of patient care. COC (Radiology) considered it feasible to explore introducing tele-radiology to enhance the overall system efficiency. However, engaging in off-site tele-radiology duties would mean that off-site Radiologists were in fact performing on-site work. The time involved and efforts made should be duly recognized and counted as work accordingly.

691 COC (Radiology) considered that currently MRI might not be critically essential for delivering emergency care. They pointed out that the main bulk of emergency service requests came before midnight and, as most patients would require urgent CT and interventional radiology, augmenting the extended-day CT capacity could be a feasible option. Since the number of radiological examinations was expected to increase after office hours, the following model was proposed as a feasible way to support the whole system in order to achieve the objectives of Doctor Work Reform:

a) The extended CT work would be taken up by senior Radiologists up to midnight.
b) An on-call resident specialist would provide on-site cover from midnight till 9 am the next day for risk management purpose.
c) The coverage on Saturdays, Sundays and public holidays would be similar to that of weekdays and on par with services provided by other clinical departments.
d) Supporting staff like radiographers and nurses would have to be increased accordingly.

692 COC (Radiology) stressed that care protocols, together with relevant monitoring mechanisms, should be developed in consultation with all stakeholders before implementation of any significant reform in radiology service. Direct communication between the attending specialists and Radiologists, in particular during the off-site call period, was deemed crucial to ensure appropriateness of requests and provision of efficient radiological support for clinical departments.

693 COC (Radiology) also expressed critical manpower deficiency in the profession, as reflected in the Radiologist-to-clinician ratio (excluding Anaesthesia & Pathology), which went from the historical reference of 1:10 to 1:16.5 in 2001 and 1:17.9 in 2006. The widening gap reflected an upsurge demand for diagnostic imaging support and interventional radiology services along with technological advancement and changing clinical practice. In view of the prevailing recruitment and retention difficulties for Radiologists due to the rapid brain drain in recent years, COC (Radiology) suggested HA to consider the following measures:

a) To recruit more trainee Radiologists and Radiographers – A team comprising 1 Associate Consultant, 2 Radiographers and 1 Registered Nurse was required for each centre to provide computerized tomography imaging service and perform additional interventional procedures / operating room radiography in the extended hours

b) To create more senior posts to retain well-qualified staff

c) To pay overtime allowance and permit leave encashment to tide over the existing workforce crisis

The Steering Committee's View

694 Having considered the concerns and difficulties faced by the Radiology profession, the Steering Committee supports the notion that changes should be implemented in phases in order to yield the intended outcome of optimizing workload and enhancing patient safety. It is agreed that, at the present stage, 24-hour protocol-driven MRI service may not be critically essential for delivering emergency care. Extension of the service out-of-hours will be subject to availability of staffing and training of new specialists to run the service in future.

695 Instead of 24-hour protocol-driven CT service, provision of extended-day CT sessions with on-site specialist cover till midnight could be a sensible and feasible option. The current bulk of radiology service requests comes before midnight. Augmenting the extended-day CT capacity will therefore meet the rising service needs and shorten the off-site call hours of Radiologists. It is also in line with the Steering Committee's belief that care protocols and relevant monitoring mechanisms must be developed in consultation with all stakeholders before any significant reform takes place in the whole system. HA may consider planning ahead for the extended-day CT service and arrange for necessary training and staffing deployment in due course.

696 The Committee has reservations regarding the proposal of the COC (Radiology) for putting on-call resident specialists on rosters to provide cover from midnight till 9 am the next day. It is good for risk management purpose but this should be balanced with the risk of lengthening the work hours of Radiologists. Currently, there are very few requests for emergency imaging services after midnight and the contemporary off-site call system by trainees supported by seniors works well with no impending risk to patient management. Thus, this should be a possible direction that HA may explore after addressing the issue of staffing shortage in the radiology service.

697 Finally, in order to optimize night-time activities and facilitate off-site diagnostic support and radiological consultations, continuous efforts should be made to extend the clinical information system network and develop enabling information technologies, like tele-radiology, electronic patient records system and other digital and mobile communication tools. However, while the Steering Committee welcomes more extensive use of tele-radiology in patient care, it is also cognizant that the nature of work in tele-radiology is quite similar to other off-site consultations. The Steering Committee recommends a broad-brush approach in recognizing off-site Radiologists' work at home and believes that this arrangement would not adversely affect the development of tele-medicine in other specialty services.

The Steering Committee's Recommendations

698 The Steering Committee recommends HA to adopt the following measures to reinforce the overall system support and efficiency in optimizing night activities in public hospitals:

a) to develop a plan for implementing **computerized tomography service in the extended day** in selected acute hospitals with all necessary protocols, monitoring mechanisms, staff training and workforce deployment plans in place, and

b) to continue developing and **extending digital and mobile information technologies**, like tele-radiology, to facilitate off-site diagnostic support and radiological consultations

699 The above recommendations can be summarized in Figure 6.13 below.

(Fig. 6.13)