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HOSPITAL
AUTHORITY

KWONG WAH HOSPITAL

*Clinical Services Plan for
the Redevelopment of Kwong Wah Hospital*



Planning Tomorrow's Hospital



Contents

■ Executive Summary	02
■ Purpose of Plan	11
■ Background	12
■ Planning Process	18
■ Capacity Planning	22
■ Models of Care	30
■ Key Recommendations on Clinical Specialties	39
■ Role Delineation	57
■ Traditional Chinese Medicine	60
■ Principal Recommendations	63
■ Design Implications	67
■ Abbreviations	74

Appendices

Appendix I	Organisation Chart of Kwong Wah Hospital	75
Appendix II	Site Map of Kwong Wah Hospital	76
Appendix III	Terms of Reference and Membership of Steering Committee	77
Appendix IV	Key Roles and Membership of Consultant Panel	78
Appendix V	Membership of Project Team	79



Executive Summary

This report presents the Clinical Services Plan for the rebuilding of the Kwong Wah Hospital (KWH). It maps out the planned future services of the hospital taking into consideration amongst other things its current and projected service demands. The Clinical Services Plan will form an integral part of a master development plan that guides the design and construction of the new buildings and facilities. The executive summary can be read in isolation but readers are encouraged to address the report in its entirety.

About KWH

The KWH, a district hospital under the management of the Hospital Authority (HA), is part of the Tung Wah Group of Hospitals (TWGHs). It is located in central Kowloon and is one of the hospitals in the HA's Kowloon West Cluster for purposes of management and service networking. Physically it is at the boundaries of the Kowloon Central Cluster and within a comfortable walking distance to the major referral hospital of the Kowloon Central Cluster, the Queen Elizabeth Hospital (QEH).

The hospital has a unique culture which reflects its charitable origins and community identity. The staff members are intensely loyal and for many it is more of a vocation than a job. The commitment to Traditional Chinese Medicine (TCM) also reflects the historical development of the TWGHs.



Background of the Review

The majority of the infrastructure of the KWH is over 50 years old and not conducive to the type of care now being offered. The decision has been made, with the full support of all stakeholders, to rebuild the hospital on its current campus. This strategic planning process was established to determine the models of care, technological advances and human factors necessary to fulfil the aspirations of all parties for a redeveloped KWH.

The shared objectives for the redeveloped hospital are:

- A greater focus on care in an ambulatory setting
- True integration of service delivery and research in TCM
- To build on the skills that have enabled KWH to become a leader in minimally invasive procedures

Planning Process

An international consultant with experience in similar projects was appointed to advise the project team. The project team was drawn from members of the Strategy and Planning Division of the HA and chaired by the Director of the Division. An advisory panel of eminent health experts was also established to advise the project team on matters of process as well as to provide professional insight into aspects of clinical practice. The Steering Committee chaired by the Chief Executive of the HA oversaw the project.



The review examined each clinical discipline / specialty. The methodology involved a questionnaire which was distributed to 30 clinical departments of KWH and to a further 55 in the four adjoining hospitals: Princess Margaret Hospital (PMH), TWGHs Wong Tai Sin Hospital (WTSH), Our Lady of Maryknoll Hospital (OLMH), and QEH. Data from the HA's own data warehouse was analysed and reconciled with the survey responses from the individual clinical units.

An intensive one month consultation period was held in March 2009. In all, about 200 staff members participated in the 30 sessions conducted at KWH and 8 sessions at PMH and QEH.

The project team recognises that planning hospitals on the perceived future and aspirations of individual disciplines is valid but likely to produce a dysfunctional aggregation of *fiefdoms*. The project team has also examined international trends in hospital development and models of care. These considerations frame the recommendations.

Existing Service

KWH offers a comprehensive range of clinical services, however, notable gaps in the services are non-radiation oncology, cardiothoracic surgery, paediatric surgery and psychiatry. There are presently about 1,200 beds. Each day a total of 1,800 to 2,000 patients attend the specialist, family and general outpatient clinics. Around 350 to 400 patients attend the Accident and Emergency Department each day of which slightly more than one quarter are admitted. These admissions are, in turn, around 45% of the total daily admissions. About 5,500 babies are born in the hospital each year.



Although the hospital is of necessity a large general hospital, pockets of excellence and innovation exist in, for example, stroke management and minimally invasive procedures across a range of disciplines. A significant proportion of the hospital's workload relates to cancer which, in addition to the emergency presentations is fuelled by the Well Men's and Well Women's clinics operated by the TWGHs. Considerable expertise and experience is available for breast, head and neck, colonic and prostate malignancies.

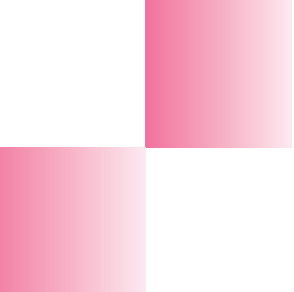
Recommended Service Direction

A very condensed presentation of future direction for each clinical service is presented in the tables on the following page which were developed for each discipline (i) a scored role delineation, (ii) recommended service enhancement, (iii) ambulatory care component, and (iv) opportunities for collaboration with TCM.

Recommended Future Direction for Clinical Specialties at KWH

Specialty (Role Delineation)	Service Enhancement	Ambulatory Care Component	Collaboration with Chinese Medicine
Accident and Emergency (6)	<ul style="list-style-type: none"> • Introduce Emergency Medicine ward • Enhance isolation facilities • Fast track system for, e.g. minor injuries • 24-hour Computed Tomography (CT) 	Not applicable (NA)	Management of bone and joint injuries by bone setters
Anaesthesia (6)	<ul style="list-style-type: none"> • 24-hour obstetric epidural service • Multidisciplinary pain service • Operating Theatre (OT) for minimally invasive surgery, robotic surgery, digital subtraction angiography (DSA) • Positive pressure OT 	<ul style="list-style-type: none"> • Integrated pain centre • Pre-anaesthetic clinic for pre-op care 	<ul style="list-style-type: none"> • Integrated pain centre • Acupuncture anaesthesia
Intensive Care Unit (6)	<ul style="list-style-type: none"> • Co-location of services with similar level of care • Enhance nursing support • Isolation room for infectious cases 	NA	Nil
Medicine & Geriatrics (6)	<ul style="list-style-type: none"> • Elderly friendly facilities • Enhance primary percutaneous coronary intervention and cardiac catheterization facilities • Non-radiation oncology support for medical patients 	<ul style="list-style-type: none"> • Involve most sub-specialties • Diabetic centre, endoscopy centre, cardiology investigations 	<ul style="list-style-type: none"> • Palliative care for cancer and renal patients • Patients with general medical problem, e.g. diabetes, hypertension
Neurosurgery (5/6)	<ul style="list-style-type: none"> • Neurosurgical High Dependency Unit • Endovascular theatre with DSA <p><i>Note: Service enhancement has to be considered under the context of the proposed Centre of Excellence in Neuroscience</i></p>	<ul style="list-style-type: none"> • Pre-op and follow-up cases • Neurological diagnostic procedures 	Acupuncture services for stroke and neurological rehabilitation patients
Obstetrics & Gynaecology (6)	<ul style="list-style-type: none"> • Enhance obstetric epidural support • Non-radiation oncology support for patients with gynaecological malignancy 	<ul style="list-style-type: none"> • A large proportion of gynaecological service • Obstetric and day fetal assessment • Endoscopic and laparoscopic surgery 	Joint TCM clinic

Specialty (Role Delineation)	Service Enhancement	Ambulatory Care Component	Collaboration with Chinese Medicine
Orthopaedics & Traumatology (6)	Development of minimally invasive and computer navigated spinal surgery	<ul style="list-style-type: none"> • Strength in ambulatory care and arthroscopic surgery • Joint replacement surgery in ambulatory setting 	<ul style="list-style-type: none"> • Minor injuries also treated by bone setters • TCM for diabetic foot • Acupuncture for chronic musculoskeletal pain
Paediatrics (5/6)	<ul style="list-style-type: none"> • Child friendly facilities • Improved isolation facilities <p><i>Note: Service enhancement has to be considered under the context of the proposed Centre of Excellence in Paediatrics</i></p>	<ul style="list-style-type: none"> • Multidisciplinary involvement • Dedicated facilities for children • Neurology, obesity, adolescent and respiratory care 	Nil
Pathology (6)	<ul style="list-style-type: none"> • Enhance specimen transport system • Positive pressure rooms for biochemical safety 	Fine needle aspiration biopsy	Authentic Chinese Medicine laboratory
Radiology (6)	<ul style="list-style-type: none"> • Filmless imaging • Picture Archiving & Communication system • Endovascular OT suite • Additional CT shared with other services, e.g. A&E, endovascular theatre • Consider universal imaging suite 	<ul style="list-style-type: none"> • Significant proportion of radiology service • Endovascular procedures and high technology treatment modalities e.g. selective infusion of chemotherapy 	NA
Surgery (6)	<ul style="list-style-type: none"> • Non-radiation oncology support for surgical patients • Endovascular OT suite • Minimally invasive surgery training centre • Endoscopic/robotic surgery • Emergency endoscopy 	<ul style="list-style-type: none"> • Same day surgery for various surgical subspecialties • Combined endoscopy centre 	Perioperative support
Family Medicine & GOPC (5/6)	Chronic disease care model	NA	Integrated service for musculoskeletal disorders
Psychiatry (3/4)	Strengthen psychiatric liaison in A&E and Emergency Medicine ward	NA	NA



It should be noted that the proposals to develop centres of excellence in paediatrics and neuroscience mean that, of necessity, some of the future scenarios need to be qualified pending final determination of the roles of these centres. There are two aspects to this. Firstly, the two proposed hospitals / institutes are likely to be located in central Kowloon. Secondly, in the areas of neuroscience and paediatrics KWH has significant expertise.

Principal Recommendations

It is recommended that the centrepiece of the new KWH will be an ambulatory centre, and that non-radiation oncology service be introduced in the hospital. These two major recommendations are elaborated below.

Ambulatory Centre

The worldwide trend is for the development of ambulatory centres. These centres are characterised by concentrations of advanced technology and clinical expertise in an environment that is not determined by traditional hospital concepts of wards and beds. Many patients now, and even a greater proportion in the future, will not require an overnight stay in an institution. The change required in both the community and the way in which health professionals work to realise these developments are significant. A total rethink and reconstruction of a hospital will be a major catalyst for the inception of these changes.

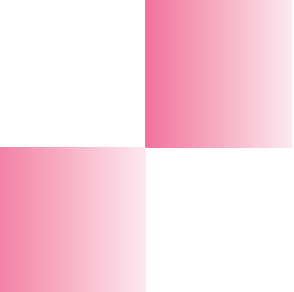
The other objectives of this review easily fall in behind this fundamental shift in the approach to health care. Day admissions, high-tech surgical technologies, efficient patient management and *way finding* are logical developments to fulfil this vision. The redevelopment aims to change the models of care in favour of ambulatory and short stay management by the adoption of smart technology and minimally invasive techniques. At the same time these technologically driven developments will incorporate the skills and wisdom of traditional practitioners.

There is a convergence of these objectives in non-radiation oncology, surgery, geriatrics, rehabilitation, pain relief and palliation. The opportunities presented by this convergence should not be ignored.



Non-radiation Oncology Service

The most important service gap identified and hence the most significant of the recommendations relates to non-radiation oncology. Many patients with cancer who have their initial management at KWH, usually a surgical or procedural intervention, also require chemotherapy and radiation therapy pre-operatively or post-operatively or in some cases both. Radiation therapy is not available at KWH as its provision is strategically managed under the cluster networking arrangement. However, the absence of chemotherapy service in KWH is a service gap that should be resolved, particularly given the focus of TCM on the campus and the strategic intent of the redevelopment. The complementarities of TCM and Western chemotherapy are generally acknowledged as one of the areas for further research and development.



The immediate commencement and progressive development of non-radiation oncology is strategically supported. The focus will be on the chemotherapy clinical assessment component. Facilitation and advocacy for cancer patients are also needed. Radiation therapy will be developed in line with HA planning and is not likely to involve KWH. The evidence in favour of a critical mass for radiation therapy is hard to ignore, particularly with the close proximity of the QEH.

Design Implications

The vision for the new hospital is that it will be showcased by an ambulatory centre that is accessible, patient / client friendly and culturally appropriate. The centre will dominate the campus and build on the access provided by the MTR station, the location in the heart of Kowloon, and the history and traditions of TWGHs.

The campus redevelopment will be a challenge, as indeed it should be. The iconic Tung Wah Museum will continue to be the cultural focus of the campus and innovative design should ensure that this is so. Revamping models of care in critical zones (A&E, ICU, etc.) will ensure that objectives of efficiency, patient and staff safety, and accessibility are addressed. Ward designs will need to be *high rise*. The campus will not provide for other options. Large floor plates and modular design should be pursued wherever possible.

In subsequent stages of this project that covers master planning, technical feasibility study and the like, the principles established in this strategic plan should be carried forward and treated as *sacrosanct*.

Concluding Remarks

The history, traditions and unique culture of KWH and its parent organisation the TWGHs is a legacy that should be carried forward. In 2011 KWH will celebrate its centenary. This Clinical Services Plan sets out to ensure that the next 100 years will begin with leading edge facilities and technologies to support the excellence of the men and women who dedicate their professional lives to this institution.

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Purpose of Plan

This document presents the Clinical Services Plan for the redevelopment of the Kwong Wah Hospital (KWH). Mapping out the planned future services of the hospital, it is the culmination of an intense, highly consultative process with clinical and executive staff of KWH.

The report considers the design implications of the preferred strategies but it is not a document about design or master planning. It is intended however, to inform the design process that will follow the adoption of the Plan.

The report does not address workforce issues or the change management strategies necessary to give effect to the models of care described, although the importance of the workforce strategies cannot be overstated.



Background

The Kwong Wah Hospital (KWH) will celebrate its centenary in 2011. The hospital is the flagship of the Tung Wah Group of Hospitals (TWGHs). The parent group can be traced back to its charitable origins in the 1850's with the first Tung Wah Hospital established in 1872.

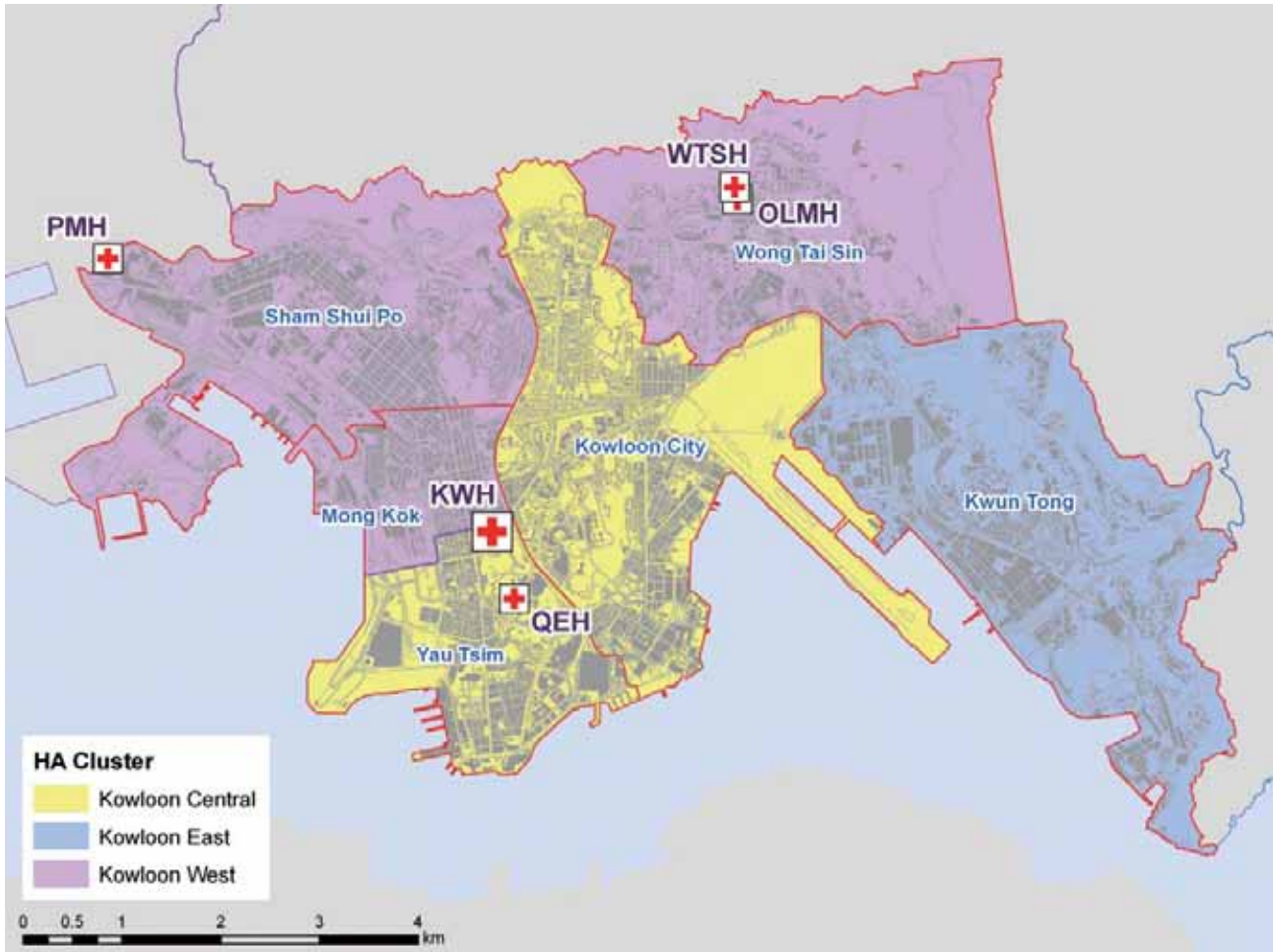
The group is today a leading charitable organization in Hong Kong and has extensive support from business leaders and the broader community. It has four other hospitals besides KWH (Tung Wah Hospital, Tung Wah Eastern Hospital, TWGHs Wong Tai Sin Hospital and TWGHs Fung Yiu King Hospital) with a total of 2,747 beds, which constitute 10% of the public hospital beds in Hong Kong. The group also runs a number of Chinese medicine clinics, two well women clinics, a well men clinic, out-reaching home care services for the elderly and a dental health centre for senior citizens. An organization chart of KWH is available at *Appendix I*.

Of relevance to this review is the charitable background which means that many services which would typically involve a cost to the consumer are available free at KWH. Charitable and philanthropic funds are also available to the hospital. Many of the services have been heavily subsidised to offer a degree of sophistication which would not be possible from HA funding alone. This subsidy is particularly evident in the acquisition of high technology services. The Board of the TWGHs also provides significant political and cultural support which would not be the case for other public hospitals.



The staff members at KWH are intensely supportive. Extraordinary lengths of service are the norm. Some clinicians have turned their backs on more lucrative appointments in order to continue to service KWH. This loyalty influences day to day practice and explains a lot of the aspirations of the hospital that will be discussed throughout this report.

Part of these aspirations is the nurturing of traditional Chinese medicine and the incorporation of traditional practitioners with Western medicine. The collaboration will need to be more than symbolic. Traditional Chinese medicine will need to have a physical presence on the campus which acknowledges its uniqueness but does not inhibit significant interaction and collaboration with other clinical streams.



Location of KWH

The importance of KWH to the community is underpinned by its physical location in Kowloon. It is at the very centre of what is arguably the world's most densely populated area. The location is both an enormous asset and a real challenge for planners and architects. The MTR is adjacent to the campus, a small plot in the midst of a densely built up area. Illustrated in *Appendix II* is the site map of KWH.

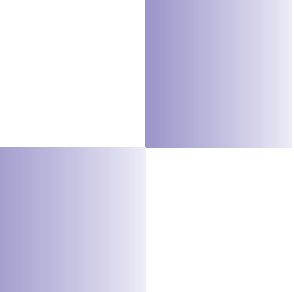
In terms of cluster arrangement, KWH is located in the Kowloon Western Cluster but is geographically very close to Queen Elizabeth Hospital (QEH), the referral hospital in the adjoining Kowloon Central Cluster. The referral hospital for the Kowloon

Western Cluster is the Princess Margaret Hospital (PMH) which is much further away from KWH. Two hospitals supporting KWH from the same cluster are the Wong Tai Sin Hospital (WTSH) and Our Lady of Maryknoll Hospital (OLMH). The diagram on the opposite page shows the three clusters that cover Kowloon and indicates the positioning of KWH and these four other hospitals.

About the Review

This review is the result of a joint decision by the TWGHs Board and the HA to rebuild the KWH. The redevelopment proposal has the in-principle approval of the government. It entails the construction of a new major hospital complex incorporating a Chinese Medicine Wing whilst retaining the Tsui Tsin Tong Out-patient Building and the Tung Wah Museum, a heritage building built in 1911. The museum stands proudly in the centre of the campus, and although a challenge for architects, is a powerful symbol of the origins of the TWGHs and its aspirations for the future.





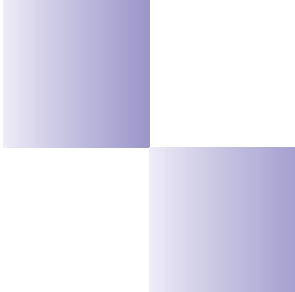
In the past hospitals have been rebuilt often from outdated plans with even more outdated thinking behind them. On this occasion the entire project has begun with an examination of how models of care are likely to change and an assessment of the impact that technology will have on health care delivery in the foreseeable future. Thus the planning maxim of *function before form* has been respected. All parties are committed to seeing that these principles are carried forward to subsequent stages of the redevelopment process, master planning, design and construction.

As part of the brief for the project it was determined that the role and function of the four adjoining hospitals should also be reviewed. The review of PMH, QEH, WTSH, and OLMH was conducted using the same methodology, but without the same intensity or attention to detail as the review undertaken at the KWH.

The terms of reference for this project did not include non-clinical support services even though catering, transport and parking, stores, purchasing, etc. are crucial for master planning. They are not within the scope of this project. However the implications for clinical services planning of aspects of non-clinical services strategies are of such importance that some comment has been made. This is mostly confined to the Design Implications section of this report.

Other Issues

Many at KWH have pointed out the somewhat incongruous positioning of KWH within the three hospital clusters in the Kowloon Peninsula and would have preferred a different clustering arrangement. This issue is highlighted, not to pass judgement, but to explain some of the factors that confounded the review. Throughout this strategic review it is assumed that KWH will need to have a close collaboration with one or more referral hospitals. It is beyond the scope of this review to make decisions or recommendations in relation to cluster configurations.



Also complicating this review is the government's plan to develop centres of excellence in two clinical areas. These are neuroscience and paediatrics. They are well advanced in the planning process. Both hospitals / institutes are likely to be located in central Kowloon and both have the potential to impact on the present and future role of KWH. The implications for the respective disciplines in KWH are discussed in the section, Key Recommendations on Clinical Specialties, without passing judgement on any particular proposal or policy intent.

Summary

This background section would be incomplete without emphasising the commonality of purpose of not just the KWH, the TWGHs Board and the HA but of all stakeholders to use this exercise to introduce new models of care supported by intelligent design which will chart a course for hospital development across Hong Kong for years to come.

The willingness of clinicians to embrace change, even under the threat of a shift of resources is highly commendable and has made this exercise more enjoyable if not necessarily easier.



Planning Process

An international consultant with experience in similar projects was engaged by the HA to formulate this Clinical Services Plan. A Steering Committee chaired by the Chief Executive of the HA oversaw the project, which commenced in January 2009. Its membership and terms of reference is at *Appendix III*. The work of the consultant was supported by a project team comprising staff from the Strategy and Planning Division of the HA. An advisory panel of eminent health experts was also formed to advise the project team. The respective memberships of the consultant panel and project team are set out in *Appendixes IV and V*.

Staff consultation and engagement was a crucial component of the planning process. The commitment demonstrated by the staff and management of KWH in the process was remarkable. As is evident throughout the report, this exercise would not have gone thus far in such a short time without their enthusiastic support and participation.

Methodology

The review examined each discipline / specialty currently available at KWH, how models of care are likely to change, and the impact that technology would have on health care delivery in the next decade or so. Information was collected through a questionnaire survey and face-to-face consultation interviews with senior clinical staff and executives conducted between January and March 2009. The process also involved demand projection that informed capacity planning for the new facilities, evaluation by consultant panel, and policy overlay provided by the Steering Committee. A role delineation approach is also adopted for the development process.



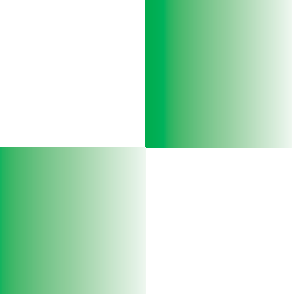
Questionnaire Survey

This was a self-administered questionnaire survey covering KWH and the four adjoining hospitals: PMH, QEH, WTSH and OLMH. Thirty departments covering medical, nursing and allied health disciplines from KWH and a combined total of 55 from the other four hospitals participated in the survey. Questions covered existing service and staff profile, service gaps, key relationships with other disciplines or hospitals, and future development plans of each specialty.

Service heads and senior clinicians were briefed about the project and process before they were invited to complete the questionnaire. Responses received were of very high quality and reflected the dedication of the clinical teams.

Consultation Interviews

Using the completed questionnaires as a basis, the overseas consultant conducted an extensive series of consultation interviews in March 2009. Participants included hospital management, service heads and relevant staff from the clinical departments. The sessions helped to clarify responses in the survey returns, addressed issues related to service gaps, and deliberated present and future models of care.



A total of some 150 staff members of KWH were interviewed in 30 sessions. Another 8 sessions were conducted at PMH and QEH for around 50 clinicians.

Role Delineation

Role delineation refers to a classification of the level of clinical services based on the sophistication of their service delivery models that includes factors such as the range of support services available and staff mix. It provides a systematic basis for developing an appropriate model for the organization and delivery of healthcare services. Under the approach, clinical services are classified into different levels, each with a defined level of support services, staff mix and other requirements. This helps to ensure that clinical services meet safety requirements and are appropriately supported.

The levels of care delivered by the surveyed hospitals were analysed based on information from the survey and clarification during the consultation sessions. Results of the analysis are presented in the Role Delineation section of this report.

Demand Projection

Service demand for KWH for the coming decade or so was computed by the project team with consideration of population growth and demographic changes up to 2021. Details of this process are documented in the Capacity Planning section of this report. The demand projection also factored in the growth for individual clinical service in the light of international trends, as well as anticipated development and patient load.

Evaluation by Consultant Panel

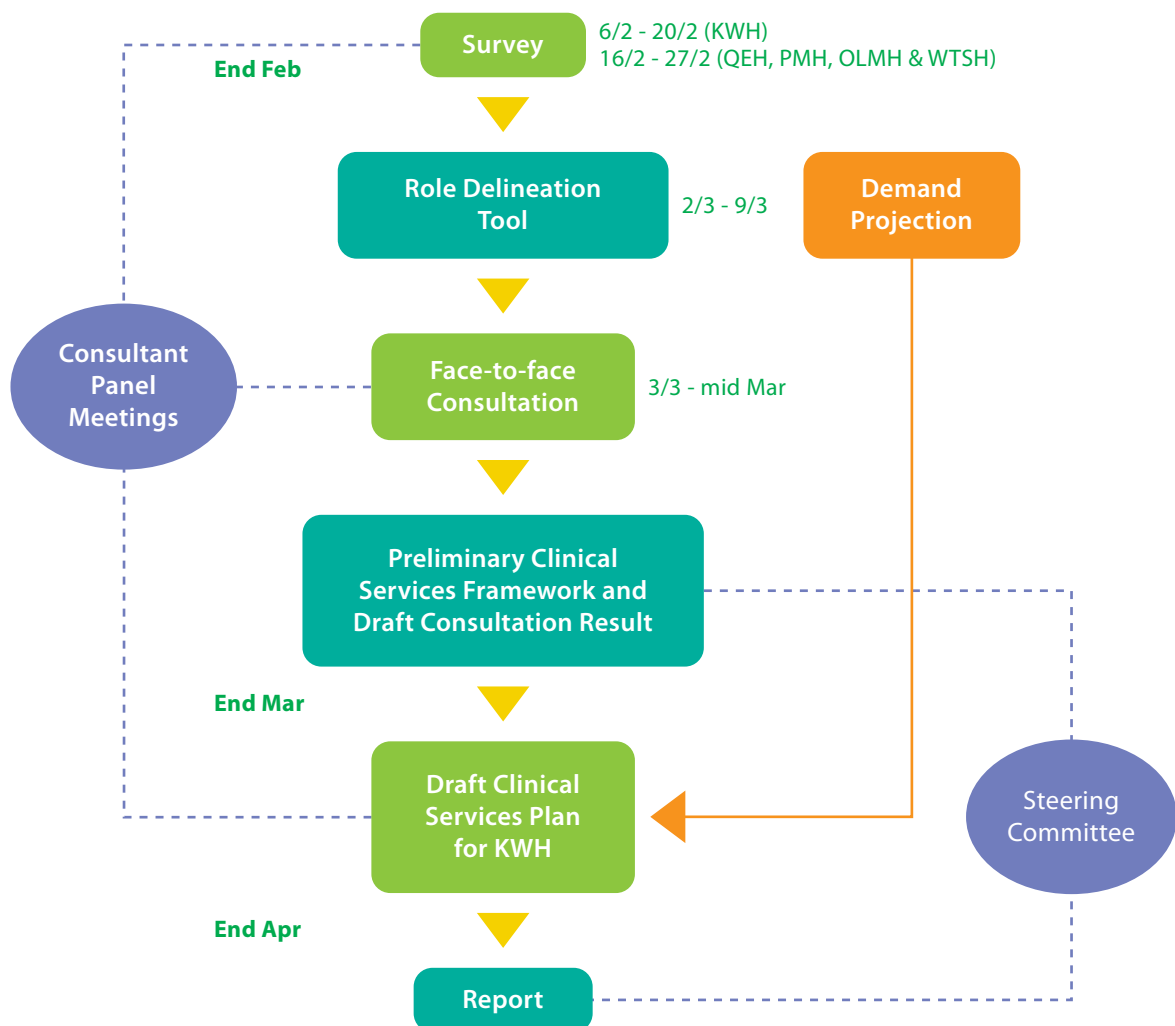
Information collected from the questionnaire survey and consultation interviews was evaluated and synthesized for the drafting of the Clinical Services Plan, supplemented by data from the demand projection. The Consultant Panel reviewed the results and deliberated on recommendations for the plan. These covered the anticipated service demand, future models of care, development of specific services, service enhancement, and capacity appropriate for the new KWH.

Policy Overlay

Policy overlay for the Clinical Services Plan was provided through the Steering Committee. This involved policy decisions at high level with broad considerations having regard to the views of various stakeholders including the government, HA Board and the TWGHs.

Summary

Illustrated below is the methodology and process outlined above for the development of the Clinical Services Plan.





Capacity Planning

A key factor underpinning the formulation of the Clinical Services Plan for KWH redevelopment is the projected demand for clinical services, which forms the basis for capacity planning. This chapter gives an overview of the capacity planning for the number of beds and operating theatre (OT) rooms required to be provided at the new KWH.

Methodology

Using demand modelling techniques the Project Team carried out a demand projection exercise to determine the future capacity required of KWH in terms of hospital beds and OT rooms for the next 10 to 14 years up to 2021, with 2007 as the base year. The projection took into account population growth and demographic changes as well as age and specialty specific service utilization trends.

OT Room Projection

The projected number of OT rooms required was computed using age/specialty specific rate of operations and magnitude of procedures. The projection based specifically on the past utilization trend of OT rooms at KWH, and assumed a benchmark throughput of 1,000 operations per room per year.

Projection results show that 14 OT rooms would be required at KWH in 2021. The projected number for year 2016 was 13.



Bed Projection

The demand for hospital beds at KWH was projected using HA-wide age/specialty specific admission rates and average length of stay (ALOS). To cross check against over- or under-estimation of the required capacity, the team also worked out another set of projections using the same parameters of admission rates and ALOS but based specifically on the past utilization trend of KWH services instead of HA-wide data, an approach known as the supply-side projection.

Scenario modelling was also carried out in the bed projection to factor in the impact of changes in service demand.

Data Source

The projections were based on data from three main data sources:

- Service utilization data from the HA data warehouse, which included the Integrated Patient Administration System, the Obstetrics Clinical Information System for newborn delivery data, the Executive Information System for bed occupancy data, and Operating Theatre Record System (OTRS), for data of years 2004 to 2007

- Local birth statistics in 2007 and birth projection figures from 2007 to 2021, obtained from the Census & Statistics Department (C&SD) of the government
- Population projection figures from 2007 to 2021 obtained from the C&SD

The demand-side projection of bed requirement also drew on district-based population projection from 2016 to 2021 obtained from the government's Planning Department.

Planning Parameters

All planning parameters for the projections were age and specialty-specific. They comprised a combination of the following age and specialty groups:

- 10 age groups of 0-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-59, 60-64, 65-69, 70+
- 10 specialty groups of Medicine, Paediatrics, Surgery, Orthopaedics, Neurosurgery, Ear, Nose & Throat (ENT), ICU/HDU, Neonatal ICU (NICU), Special Care Baby Unit (SCBU), and others
- Age-specific rates per female population for Obstetrics and Gynaecology specialties

Bed Projection Model

Demand-side Projection

For the demand-side projection of bed requirement, the volume and mix of expected service demand from residents in each of the 21 districts were first computed taking into account population growth and ageing, as well as age- and specialty-specific hospital service utilization rate over the period from 2007 to 2021.

Based on the HA-wide utilization rate at base year 2007, the model was applied to project service demand for Medicine, Paediatrics, Surgery, Orthopaedics, Neurosurgery, ENT, Gynaecology and ICU/HDU. Using the base-year data on specialty-specific cross-district hospital flow for acute bed days, the hospital patronage pattern across the 21 districts was also computed. The demand for KWH acute bed days was then derived by applying this hospital patronage pattern specifically for KWH, that is, the proportion of residents residing in each of the 21 districts who used KWH service.



The demand for Obstetrics, NICU and SCBU, on the other hand, were derived from projected births in Hong Kong together with consideration of district-specific general fertility rate for the projected female population aged 15 to 49. The data included both births to local women and births to Mainland women. KWH's share of births among the eight Obstetric units across HA hospitals were then computed to obtain the projected demand for its Obstetrics, NICU and SCBU services.

Supply-side Projection

Based on KWH utilization rate at base year 2007, age- and specialty-specific service projections were made which took into account population growth and ageing, as well as age- and specialty-specific admission rates, length of stay and percentage share of day patients specifically in KWH. The service projection for NICU and SCBU were derived from applying the above to the projected growth in births as obtained from the C&SD.

Assumptions for Bed Projection

The projection models described above provided a base case scenario to demonstrate the nature and volume of work to be expected for KWH in 2021 assuming the patient mix and volume, referral patterns and policy remain the same for KWH.

Both projection models covered both inpatient and day patient bed days. The projected bed days were translated into the number of beds required for each specialty by assuming an optimum occupancy rate of 85%. For specialties of ICU/ HDU and NICU, a lower optimum occupancy rate of 80% was assumed since these departments generally admit patients on an urgent but random basis so more flexibility should be allowed.

Other assumptions for the projection included the following:

- Market share of HA i.e. public-private split in service utilization data in the base year was assumed to remain unchanged over the projection horizon.
- The projected number of births to mainland mothers in Hong Kong was assumed to cap at 30,000

Scenario Modelling in Bed Projection

Besides the base case scenario in which all the planning parameters were assumed to be unchanged as in base year 2007, two different scenarios were constructed for both the demand-side and supply-side projections to model changes in service demand, including changes in ALOS and service substitution and diversion which sought to promote effective alternatives to reduce reliance on inpatient hospital services:

- Scenario A – It depicted an efficiency gain in inpatient services achieved through reducing ALOS by 1% per year over the whole projection horizon.
- Scenario B – In this scenario, on top of the efficiency gain of 1% for ALOS, it was assumed that the share of day patient service (as compared to inpatient service) for hospital admissions would increase.

For Scenario B, the day patient (DP) share for the demand-side projection was assumed to increase by 0.5 or 1 percentage point per year by comparing the past specialty-specific DP share trends with international benchmarks. For instance the base-year DP share for the Medicine specialty was 26% but was assumed to increase to 40% (a total of 14 percentage points) by 2021. This was considered to be achievable given that the projected level in Australia was 60% by 2012. As for the supply-side projection, it was assumed that 1% of the inpatient episodes would be shifted to DP episodes per year.

Bed Requirement

The projected bed requirements for KWH by 2016 and 2021 are summarized in the two tables on page 28 and 29 respectively. The number of beds required was highest under the Base Case Scenario. Scenario B, being the most efficient scenario, would require the least number of beds.



Results from both demand-side and supply-side projections were similar, though the latter yielded a slightly higher number of beds. Their differences were well within 6% in all the three scenarios. In sum, the number of beds required at the new KWH by 2021 was around 1,010 to 1,260 based on demand-side projection, and around 1,080 to 1,340 from supply-side projection.

By-specialty results show that the Medicine specialty required the largest number of beds and accounted for around 40% of the total beds. The other two specialties with a high number of projected beds were Surgery (20% of total beds) and Orthopaedics (10% of total beds).

It should be noted that the by-specialty beds are only indicative numbers and are presented in the context of the by-specialty projection model. As is highlighted in the Principal Recommendations section of this report, the usage of ward spaces needs to be more dynamic instead of following rigid bed allocation to specific teams and disciplines. The notion of specialty-based wards will be phased out in the new KWH.

Bed Requirement for KWH from Both Demand-side and Supply-side Projections in 2016 under Different Scenarios

Specialty	Base Case Scenario		Scenario A - 1% efficiency gain in ALOS		Scenario B - 1% efficiency gain in ALOS + increase in DP	
	Demand-side projection	Supply-side projection	Demand-side projection	Supply-side projection	Demand-side projection	Supply-side projection
Medicine	468	501	430	461	393	434
Obstetrics & Gynaecology	123	136	120	125	117	120
Paediatrics	69	76	64	70	61	67
ICU/HDU	17	14	16	13	16	13
NICU	13	8	13	7	13	7
SCBU	47	38	47	35	47	35
Surgery	234	235	216	216	195	203
Orthopaedics	121	119	111	109	102	101
Neurosurgery	51	61	47	56	47	51
ENT	3	4	3	4	2	4
Others*	19	3	19	3	19	3
Total	1,165	1,195	1,086	1,099	1,012	1,038

* For other specialties, the bed number as at year 2007 has been adopted throughout the projection horizon for the demand-side projection.

Note: By-specialty beds are only indicative, as the notion of specialty-based wards will be phased out in the new KWH.

Bed Requirement for KWH from Both Demand-side and Supply-side Projections in 2021 under Different Scenarios

Specialty	Base Case Scenario		Scenario A - 1% efficiency gain in ALOS		Scenario B - 1% efficiency gain in ALOS + increase in DP	
	Demand-side projection	Supply-side projection	Demand-side projection	Supply-side projection	Demand-side projection	Supply-side projection
Medicine	510	574	447	504	388	459
Obstetrics & Gynaecology	129	142	124	126	120	118
Paediatrics	71	82	62	73	58	67
ICU/HDU	19	17	16	15	16	15
NICU	13	8	13	7	13	7
SCBU	48	38	48	34	48	34
Surgery	261	269	230	236	195	215
Orthopaedics	131	133	114	116	99	104
Neurosurgery	56	68	49	59	49	53
ENT	4	4	3	4	3	3
Others*	19	3	19	3	19	3
Total	1,261	1,338	1,125	1,177	1,008	1,078

* For other specialties, the bed number as at year 2007 has been adopted throughout the projection horizon for the demand-side projection.

Note: By-specialty beds are only indicative, as the notion of specialty-based wards will be phased out in the new KWH.



Models of Care

The extensive consultation and staff engagement during the development process of the Clinical Services Plan have provided an excellent opportunity to introduce new models of care befitting the aspirations of all parties for a redeveloped KWH. In fact, KWH clinicians have demonstrated an ability to adapt to changes in models of care and incorporate the newer technologies that underpin these models into every day practice.

The capacity of clinical teams to perform is frequently constrained by the present physical facilities and the lack of flexibility old infrastructure presents. For KWH the opportunity presents itself for every clinical program to rethink the way they deliver services and to organise the hospital's facilities to enhance these changes.

In this section alternative models of care are considered. These models relate to ambulatory centre, minimally invasive procedures, day of surgery admission (DOSA), endovascular procedures, one stop shop through multidisciplinary collaboration, and Accident and Emergency (A&E) units.

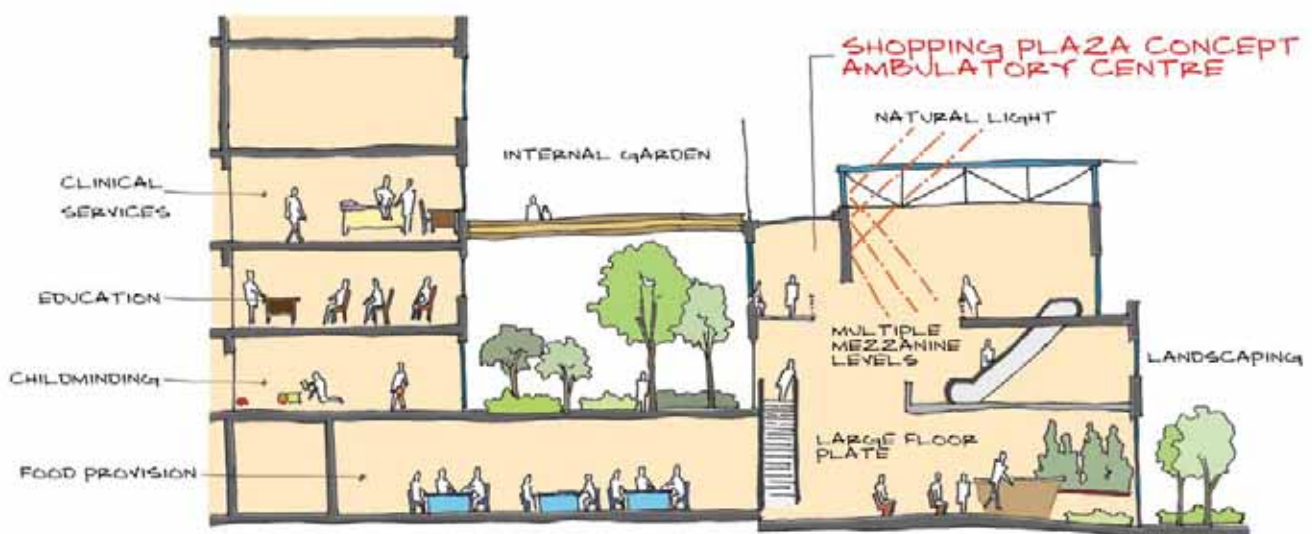
Most hospitals will have elements of these models, as indeed does KWH, but it is rare to see them all operational in the one institution. An almost total rebuild of the KWH offers an opportunity that few large hospitals will ever have. That is, the opportunity to not only embrace the changes but also to build them into the fabric of the new hospital.

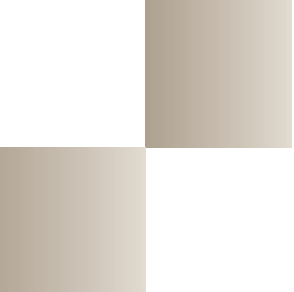
Ambulatory Centre

It is recommended that the centrepiece of the new KWH will be the *ambulatory centre*. The concept of ambulatory care is not just a new term for outpatients nor is it the end result of decreasing lengths of stay. It embodies a new philosophy that complex, sophisticated health services can be provided in a setting that is orientated to the needs of the patient as a client or consumer of healthcare.

The concept of ambulatory care does not rely on the notion that a hospital is a collection of wards containing beds where people stay overnight. Not only are these wards frequently overcrowded to the point of being demeaning to the human spirit but it has also been demonstrated that these wards put patients at additional risk. Numerous studies have shown that approximately one patient in six admitted to a public hospital has an outcome other than what was intended. These range from falls, to medication errors, to life threatening hospital acquired infections.

The acknowledgement of the risks of hospitalisation combined with new technologies has produced a revolution in hospital practice in recent years. The changes are inexorable. Every branch and every discipline of clinical medicine have embraced these concepts.





The general community view of the hospital is still of a large, austere tower block usually on a hill with a predictable design that evolved in the United Kingdom in the early part of the twentieth century in response to the need to manage patients with pulmonary tuberculosis. It is likely that the hospital of the 21st century will have more in common with a shopping / food plaza. The community's identification with the hospital will be in relation to the ambulatory centre rather than a nondescript building that houses a collection of beds.

In the section under Key Recommendations on Clinical Specialties, a range of services which would be provided in the ambulatory centre will be identified. These will range from complex surgical procedures to multidisciplinary clinics to traditional practitioners to health education classes. Haemodialysis and chemotherapy services will be crucial components of these centres. The ambulatory model is orientated to the consumer and should be accessible and culturally appropriate. Childminding, food provision, education, information and community focus are components that are as equally important as the clinical services.

Minimally Invasive Procedures

Fuelling the development in ambulatory models of care has been the evolution of *minimally invasive procedures* and the technologies that enable complex procedures to be performed with little collateral damage. Many surgical procedures carried out in a day facility are relatively minor and do not require advanced technologies. Conversely most of the surgery performed with minimal access / minimally invasive techniques still requires at least an overnight admission. KWH has been at the forefront of these newer surgical techniques and has also been developed as a training centre for established surgeons to learn / practice these techniques.



A number of procedures can now be performed without the need for an overnight admission. This is not to say that the procedures are simple or that the conditions being treated are less complex. The injury to the patient and the tissue surrounding the operation site are minimal and discharge within the same day is feasible.

A day surgery facility can be stand alone, part of an ambulatory centre or integrated within the main theatre complex of the hospital. This theme will be developed in the Design Implications section of the report.

Day of Surgery Admission (DOSA)

Day of surgery admission is frequently confused with day surgery but it is a different concept. DOSA is when the patient is admitted on the morning or afternoon of the same day on which surgery occurs. By definition all day surgery patients also have to be a DOSA or the original purpose is defeated (although many so-called day surgery patients *are* being admitted the night before). In terms of international benchmarks the target for DOSA's are well over 90% of all surgery. Many major hospitals across Australia are achieving this figure, even for open heart surgery.

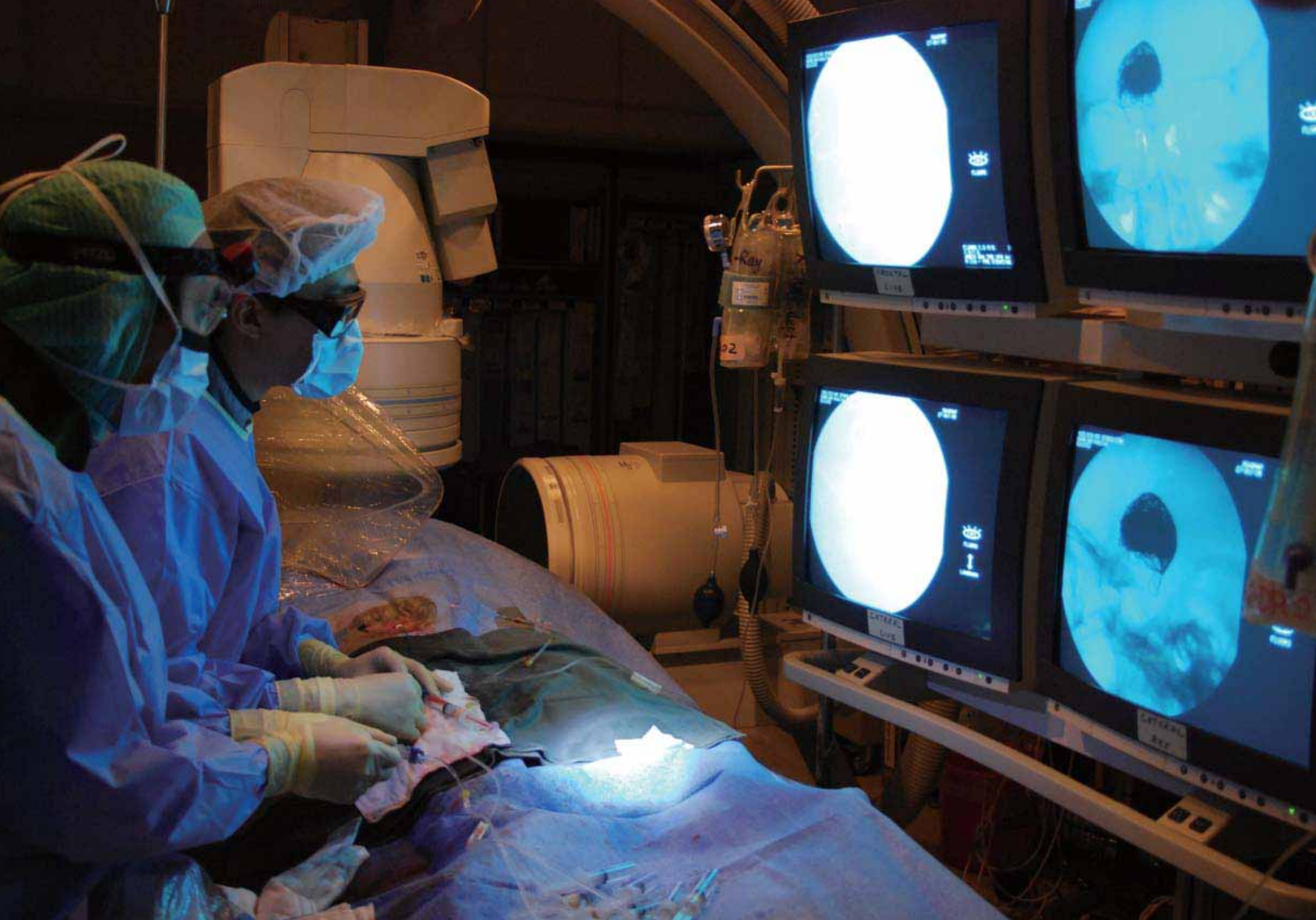
There are a number of essential pre-requisites for a successful *DOSA program*. These include *pre-anaesthetic clinics* where a patient is assessed and counselled, and consent is obtained prior to the day of admission. The pre-operative visit is also used to familiarise the patient with the point of presentation on the day of surgery and the area from which patients can be collected post-operatively.

For a dedicated day surgery unit the procedure is well defined. For DOSA patients where a multi-day admission is planned, experience suggests that a dedicated *DOSA ward* enables the patients to be assembled and assessed rapidly on the morning or afternoon of surgery. The flow is then to the theatre suite and onto recovery and only then to the *assigned* ward.

These models are complex. They require good logistics and dedication from staff particularly surgeons and anaesthetists. Late starts and list overruns create chaos in these programs.

Endovascular Procedures

Another changing model of care is *endovascular procedures*. All clinicians are familiar with the introduction of arterial catheters originally for the introduction of radio opaque material to produce angiographic images of various vascular beds. These processes in recent years have been significantly enhanced by the use of digital imaging modalities (digital subtraction angiography or DSA).



Endovascular work has now been expanded with angioplasty, stenting, coiling, ablation embolisation being applied to many organ systems for a wide range of pathologies. Even catastrophic events such as leaking / ruptured abdominal aneurisms can be successfully managed. Endovascular procedures have been considerably advanced by the addition of other imaging modalities, particularly high speed CT, to the armamentarium. The future will include endovascular infusion of designer chemotherapy agents and genetic material as stem cell technologies become a clinical reality.

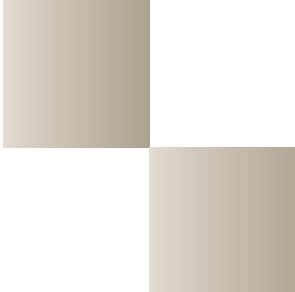
Hopefully readers will sense the case for the development of a composite practice of high technology minimal invasion, minimal trauma probably in an ambulatory setting. These systems or models of care may well converge in a new age ambulatory centre which will be customer friendly in the *front of house* but high-tech and multi-functioning in the *back of house*.

One Stop Shop through Multidisciplinary Collaboration

A further development which is complementary to the ambulatory models is the capacity to offer *one stop shopping* to patients on a multidisciplinary basis, particularly those with chronic and / or complex problems especially when there is a social or psychological overlay.



Many patients, particularly the elderly and disabled find themselves attending hospital clinics on many separate occasions, often on consecutive days, to see a diverse range of clinicians including various medical specialists, allied health disciplines and for some, Traditional Chinese Medicine practitioners. Under the ambulatory care model, clinics are organised so that an individual patient can see their health care team in one visit or at the very least, during the course of one day.



KWH is situated in one of Kowloon's districts with an ageing population who rely on KWH for their primary care as well as emergency and specialist care when needed. An ambulatory care centre can organise its services so that the health issues faced by an ageing population can be addressed by a multidisciplinary approach. Under this model a team may offer advice in relation to balance and falls, continence, exercise, nutrition, vision, degenerative joint disease, dentition, etc. Similarly, patients receiving specialist outpatient services can be offered multidisciplinary care that not only avoids unnecessary hospitalisation but improves quality of life.

These multidisciplinary models also offer a practical approach to one of the desired outcomes for the new hospital. That is the integration of traditional Chinese and Western medicine not only for research and development but also for good patient outcomes.

Accident and Emergency (A&E) Units

As mentioned elsewhere in this report the major determinant of the function of KWH is the A&E Department. Each day 350 to 400 patients present to the A&E at KWH. Of these presentations, slightly more than one quarter are admitted. This represents around 45% of the hospital's total admissions.

The management of such large numbers is a significant challenge. Currently it is being achieved but under physical conditions that are less than favourable. Emergency departments that cope with attendances far less than those seen at KWH have developed a model of care that enables them to better manage this extraordinary task. These models are not new to Hong Kong; most of the components can be seen in the emergency department at the nearby QEH though the physical layout is still less than favourable.

The essential ingredients that facilitate this extraordinary task are:

- A single point of triage that is safe, discreet and efficient.
- Waiting areas that are secure, under surveillance and child friendly.
- Sufficient cubicles to ensure that patients waiting for triage are behind the triage desk and not in the waiting room.

- Adequate and appropriately located resuscitation cubicles for Category One patients.
- Suitable spaces for distressed / grieving relatives.
- Fast track cubicles for lower triage patients / follow-ups, etc.
- A true observation ward for patients who are likely to return after 4 to 6 hours surveillance.
- A secure area where patients with dysfunctional behaviours and / or acute mental health problems can be observed and managed.
- A 24-hour emergency medicine ward under the care of the emergency physicians aimed at patients who would otherwise be admitted but who can, given intensive work-up and management, be discharged within 24 hours.
- Good functional relationships with imaging modalities (preferable plain film and CT within the department).
- Social and psychological support around the clock.
- Infection control facilities, including isolation facilities.

The model requires adequate floor space, good access and a *can do* mentality from all levels of staff. It is not possible to go into details in this report but the success of the new KWH will depend on the quality of services offered to those who present in their time of need, irrespective of whether that need is real or merely a perception of the patient / client.

Summary

This section has focused on some of the major changes that have occurred in the practice of hospital medicine over the last decade. KWH has a wonderful opportunity to take up the best of these and develop services at both ends of a spectrum, a customer focused, culturally appropriate ambulatory centre and a responsive, efficient emergency service. The new KWH will become an international showpiece of innovation and excellence in both clinical practices and the physical facilities that underpin and expedite these practices.

In subsequent sections the application of these models to individual clinical specialities and the design implications of adopting the preferred models are discussed.



Key Recommendations on Clinical Specialties

The key recommendations outlined in this section are developed through a comprehensive data collection and consultation process already described in the Planning Process section of this document. Considerations have been particularly made in the application of new models of care set out in the previous section.

There are two parts to this section. The first part relates to specialties with inpatient service that are currently provided by KWH staff while the second part consists of ambulatory care services as well as specialties that are provided at KWH by specialists from other institutions.

Part I – Specialties with Inpatient Service Provided by KWH Specialists

The specialties covered here are, in alphabetical order:

- Accident and Emergency (A&E)
- Anaesthesia
- Intensive Care
- Medicine and Geriatrics
- Neurosurgery
- Obstetrics and Gynaecology (O&G)
- Orthopaedics and Traumatology (O&T)
- Paediatrics
- Pathology
- Radiology
- Surgery

The overview for each specialty includes where appropriate (i) recommended service enhancement, (ii) ambulatory centre component, (iii) demand management, and (iv) design issues.

Accident and Emergency (A&E) Service

The A&E Department of KWH provides 24-hour service to the community. It is not a major trauma centre and there is no emergency medicine ward.

Recommended Service Enhancement

- Introduce Emergency Medicine ward and increase the number of A&E cubicles
- Enhance isolation facilities and include spaces for disaster contingency
- Implement fast track systems for patients with minor injuries, sutures and the like to increase efficiency
- 24-hour CT for A&E patients to facilitate prompt clinical decision making (facilities can be potentially shared with ambulatory centre). This also complements service such as acute stroke thrombolysis in A&E



Demand Management

- Introduction of Emergency Medicine Ward should be able to help to cater for future demands by reducing the need for inpatient beds
- Service demand will be affected by any change in ambulance catchment

Design Issues

- Separate areas for children to provide a safe and child-friendly environment
- Space for disaster plan with decontamination area outside main A&E entrance
- Improvement needed in the layout of the cubicles for better patient visibility
- Infection control facilities with special waiting area for potentially infectious cases which will also minimize their waiting time for investigations and procedures

Anaesthesia Service

The Department of Anaesthesia and Operating Theatre of KWH provides anaesthesiology services, operating theatre services as well as pain service in ambulatory care setting.

Recommended Service Enhancement

- Aim at 24-hour obstetric epidural service (with corresponding increase in the number of midwives)
- Multidisciplinary input in pain service e.g. with neurologist and clinical psychologist support
- Put in place Operating Theatres with specific design for minimally invasive surgery and robotic surgery and equipped with fixed DSA machine
- Provide positive pressure room for operation on infectious cases

Ambulatory Centre Component

- Ambulatory centre is the suitable location to provide comprehensive pain management with the support of dedicated pain nurse and clinical psychologist
- Pre-admission clinic for pre-op cases should become a standard practice
- Dedicated day surgery centre with separate Operating Theatre (free standing model) from the main Operating Theatre

Demand Management

- A significant proportion of service demand is expected to be met with the increasing number of day surgeries performed

Design Issues

- Need centralized sterilization facilities
- Consolidation of theatres will enhance economy of scale

Intensive Care Service

The intensive care service of KWH provides care to both medical and surgical adult patients while younger patients are managed in paediatrics intensive care unit (PICU). However, neurosurgical patients and patients of coronary care unit (CCU) and high dependency unit (HDU) are under the care of their respective specialties.



Recommended Service Enhancement

- Co-location of ICU with other care facilities at similar level (e.g. CCU, HDU, neurosurgical post-op) to facilitate the work of nursing and support team and enhance quality of care
- Adequate nursing staff level for safety and quality assurance
- Improve isolation facilities with isolation rooms for infection control

Demand Management

- Substantial increase in demand is not expected
- Better utilization of resource with improved quality of service is expected with co-location of similar levels of intensive care services

Design Issues

- Design should facilitate a layout with central workstation and peripheral bed distribution

Medicine and Geriatrics Service

The Department of Medicine & Geriatrics in KWH is part of the larger Department of Integrated Medical Services which is combined with the Tuberculosis & Chest Unit and the Department of Rehabilitation & Extended Care of Wong Tai Sin Hospital. The department is conducting collaborative clinical programs and research with the Chinese Medicine Service supported by TWGHs. Most subspecialties within Internal Medicine are available at KWH, with the exception of non-radiation oncology and clinical haematology.

Recommended Service Enhancement

- Provide on site non-radiation oncology service to support patients with malignancy
- Elderly friendly environment to facilitate care for the elderly in light of the ageing population
- Consider developing primary percutaneous coronary intervention in the context of service provision in the whole of HA

Ambulatory Centre Component

- Many of the investigations and less invasive therapeutic procedures in the department can be provided in the ambulatory centre. These include gastroenterology investigations, interventions and endoscopic procedures.
- Diabetic services are mostly ambulatory which fits in well with the multi-disciplinary care model
- The ambulatory centre also offers good opportunities to provide other subspecialty services like respiratory support and rehabilitation, rheumatology assessment and treatment, cardiology diagnostic centre and rehabilitation, renal dialysis centre, and electro-diagnostic centre for neurology patients
- Majority of the investigations in Cardiology, including certain interventions like cardiac catheterization, can be conducted in ambulatory setting. The ambulatory centre is also a suitable venue for cardiac rehabilitation



Demand Management

- With changing models of care, the reliance on inpatient medical beds should decrease. Patient care is expected to be increasingly delivered in day or community setting
- The demand for cardiac catheterization laboratory session is expected to increase with technological advancement and new treatment modalities like ablation for atrial fibrillation

Design Issues

- With the ageing population, it is important to have an elderly friendly ward environment
- Proper infection control facilities need to be put in place



Neurosurgery Service

The planning of neurosurgery services in KWH has to be considered under the context of the Centre of Excellence in Neuroscience proposed by the Government. The Centre is aimed at enhancing the quality of tertiary clinical services, research and training in the discipline of neuroscience through an efficient concentration of expertise, advanced technology, and cases of complex illnesses.

The neurosurgical department of KWH is one of the seven neurosurgical departments in Hong Kong. Out of these, five are designated trauma centres which include QEH, PMH, Tuen Mun Hospital, Prince of Wales Hospital and Queen Mary Hospital. The neurosurgical departments at KWH and Pamela Youde Nethersole Eastern Hospital are not trauma centre. Since KWH is not a trauma centre, severe head injury cases are referred to PMH for management.

Recommended Service Enhancement

- Enhance the neurosurgical intensive care support that is currently provided in neurosurgical HDU. The provision of high level tertiary neurosurgical services with the support of neurosurgical ICU, however, has to be considered under the context of the proposed Centre of Excellence in Neuroscience
- Put in place combined endovascular facilities (Operating Theatre with DSA) which can be shared with other clinical specialties to enhance quality and safety

Ambulatory Centre Component

- Pre-op and post-op follow-up patients would benefit from the future ambulatory centre
- With the development of ambulatory centre, it is expected that many diagnostics procedures can be conducted as ambulatory cases

Demand Management

- Most of the tertiary services and research for neuroscience services in Hong Kong will be provided by the proposed centre of excellence

Obstetrics and Gynaecology (O&G) Service

The O&G department of KWH handles a high volume of deliveries. It also provides services in assisted reproduction and runs a well women clinic, both of which are supported through the TWGHs.

Recommended Service Enhancement

- Enhance obstetric epidural support
- Provide non-radiation oncology support for patients with gynaecological malignancy

Ambulatory Centre Component

- A large proportion of the gynaecological services, including endoscopic and laparoscopic surgeries, can be provided in ambulatory setting (one stop gynaecological service)
- Ambulatory obstetric service and day fetal assessment can reduce bed requirement

Demand Management

- Significant expansion of delivery service is not recommended as it would compromise efficiency and safety. It is unlikely that additional births could be accommodated
- Most of the gynaecological workload is expected to be catered for in the ambulatory centre



Design Issues

- Operating Theatre for Caesarean Section should preferably be located near the labour ward
- More privacy is required for delivery suite, with single rooms

Orthopaedics and Traumatology (O&T) Service

The O&T department of KWH serves both adult and paediatric patients, and also provides weekly outpatient orthopaedic service to OLMH. Subspecialty services provided by the department include spine, joint replacement, sports injury, hand & microvascular, foot & ankle and paediatric orthopaedic services.

Recommended Service Enhancement

- Further develop minimally invasive spinal surgery and computer navigation spinal surgery in line with the international trend
- Enhance theatre access for hip fracture patients, who numbered around 300 per year
- Collaborate with the Traditional Chinese Medicine department of TWGHs to provide integrated care for diabetic foot disorder and back pain disorder

Ambulatory Centre Component

- The department has strength in ambulatory care with a high number of arthroscopic surgery
- Other surgeries like joint replacement surgery can also adapt well in ambulatory setting

Demand Management

- Significant proportion of future services will be delivered in ambulatory care setting
- Need to address the increasing demand for service on degenerative disorders such as joint replacement. The current joint replacement waiting time is around 2 to 3 years

Paediatric Service

The planning of paediatric service in KWH has to be considered under the context of the Centre of Excellence in Paediatrics (CEP) proposed by the Government. The Centre is aimed at enhancing the quality of tertiary clinical services, research and training in the discipline of paediatrics through an efficient concentration of expertise, advanced technology, and cases of complex illnesses.

The paediatric service of KWH accepts emergency admission of children and adolescents up to 16 years old. There are currently no paediatric surgery or cardiothoracic surgery services in KWH. Paediatric nephrology service with dialysis and transplants and the capacity to manage major paediatrics outbreak of infectious diseases are located in PMH.

Recommended Service Enhancement

- Provide child and parent friendly facilities and dedicated areas for children
- Improve isolation facilities in view of the high frequency of infectious disease among children
- Enhance neonatal support considering the number of birth per year. The provision of service, however, has to be considered under the context of the CEP

Ambulatory Centre Component

- The ambulatory centre should provide dedicated facilities for children with special entrance / waiting areas
- Multi-disciplinary ambulatory care for Neurology
- Obesity program that includes screening, weight reduction, complications screen, and multidisciplinary team involvement
- Adolescent Day Centre
- Respiratory Diagnostic Centre

Demand Management

- There is a potential demand from children currently residing in mainland China returning to Hong Kong for medical treatment
- The proposed CEP will take the lead role in providing tertiary services and research for paediatric services in Hong Kong
- The overall provision of NICU beds needs to be enhanced but this has to be considered under the context of the CEP
- The provision of Paediatrics ICU beds in general hospitals should be reviewed as the service should preferably be provided in the CEP

Design Issues

- Separate areas for children to provide a safe and child-friendly environment

Pathology Service

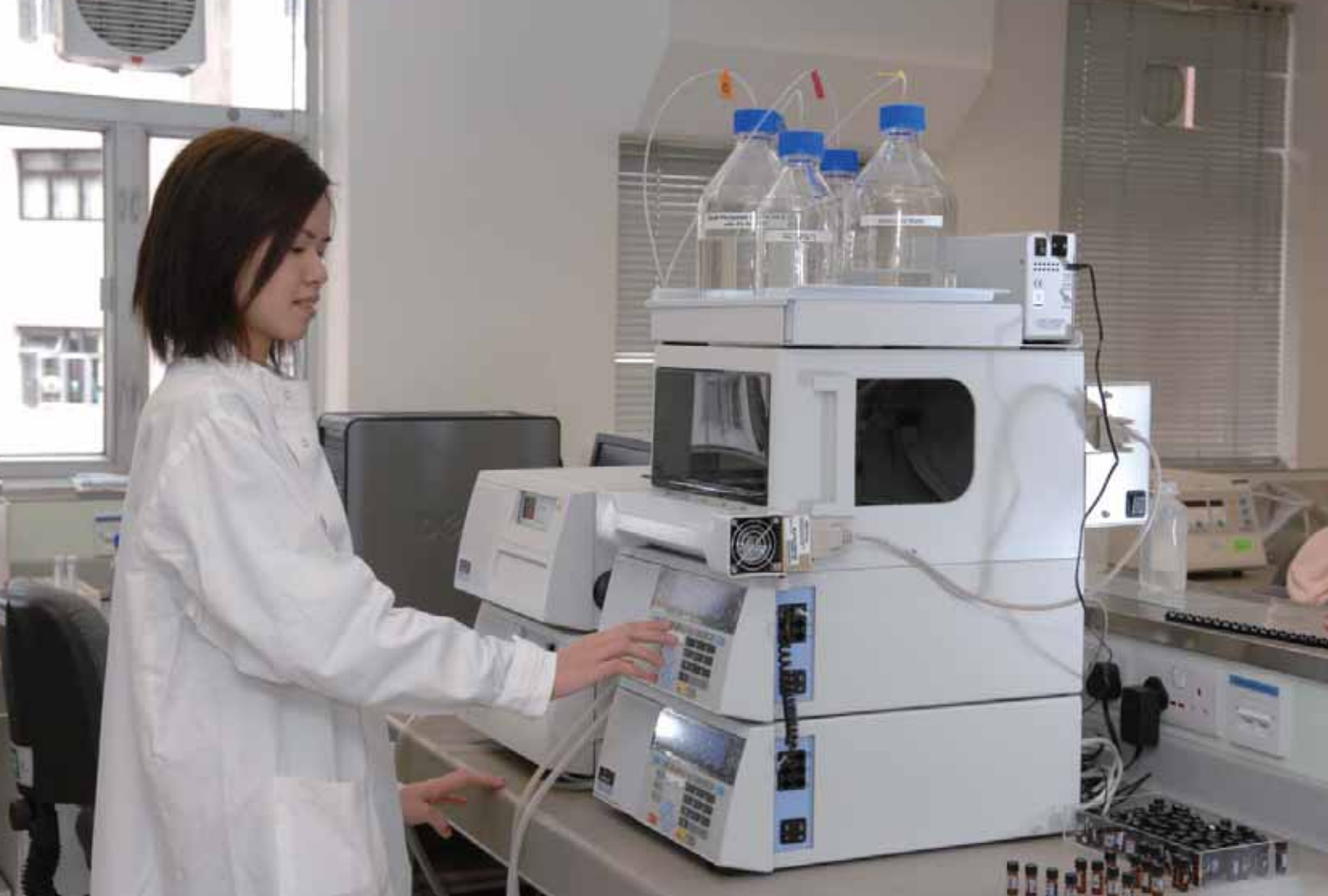
The pathology department of KWH provides pathology services including anatomical pathology, microbiology, clinical chemistry, and haematology. It also serves WTSH and OLMH.

Recommended Service Enhancement

- Put in place single positive pressure rooms for biochemical safety

Ambulatory Centre Component

- Certain pathology service e.g. fine needle aspiration is best provided in ambulatory centre



Demand Management

- More space for specimen storage and mortuary
- Develop specimen transport system (eg. Pneumatic tube) to facilitate work flow
- There will be increase in demand for molecular biology and proteomics which may be provided from a central laboratory

Design Issues

- Need designated isolation beds in acute wards and A&E for infection control
- Recommend to include specimen collection areas in ambulatory care centre

Radiology Service

The radiology department of KWH provides a full range of radiology service, including fluoroscopy, mammography, CT, ultrasound, MRI, nuclear medicine and interventional radiology. It also provides all of OLMH's and WTSH's radiology services, and cardiac catheterization service to Caritas Medical Centre and OLMH, as well as supports United Christian Hospital for prone table breast biopsy service.

Recommended Service Enhancement

- Totally filmless in the redeveloped hospital
- While imaging via Clinical Management System will serve most purpose, Picture Archiving & Communication (PAC) system is recommended especially for surgical specialties
- Dedicated operating theatre for endovascular procedures
- Install additional CT facilities, which can be shared between radiology department and endovascular theatre
- Consider the feasibility of a universal imaging suite to minimize the risk of excessive downtime when the machine needs repair / replacement
- Install CT in A&E to facilitate prompt clinical decision

Ambulatory Centre Component

- Significant proportion of radiology service is expected to be provided in ambulatory setting with advances in technology
- Many clinical procedures will be replaced by relatively less invasive imaging technology
- Ambulatory centre is expected to be equipped with a whole range of radiology service including both diagnostic and therapeutic procedures
- Endovascular specialist is expected to provide service in ambulatory radiology department serving patients from different specialties
- Development of high technology treatment modalities, e.g. selective infusion of chemotherapy is anticipated

Demand Management

- The demand for radiological imaging is expected to increase with more diseases requiring more precise radiological diagnosis and follow up. However, this will be partially offset by the advances in technology with more efficient machine

Design Issues

- Need specially designed angiographic suites with recovery area and measures for infection control and radiological safety
- Designated areas for children and babies are recommended



Surgery Service

The Department of Surgery of KWH provides general surgery and most of the surgical subspecialties, including urology, plastic surgery, breast surgery, vascular surgery, colorectal surgery, hepatobiliary surgery, upper gastroenterology investigation surgery and endocrine surgery. However, cardiothoracic surgery and paediatric surgery are not available. Neurosurgery is provided by a separate Department of Neurosurgery.

Recommended Service Enhancement

- Provide non-radiation oncology support to enhance service to surgical patients
- The patients screened at Well Women clinic of TWGHs provide a continuous demand for breast service. Similar to other surgical subspecialties, the breast service will be significantly enhanced with non-radiation oncology support
- Vascular surgery can be enhanced with the establishment of a shared dedicated operating theatre with built-in digital subtraction angiography machine

- Hepatobiliary service with its focus on malignant conditions will obviously be significantly enhanced with non-radiation oncology support. The service is also going towards minimally invasive approach e.g. laparoscopic hepatectomy
- A hospital based (cross-specialty) endoscopic surgery / robotic surgery centre will greatly enhance development and efficiency in other disciplines such as orthopaedics and O&G
- Develop emergency endoscopy service
- KWH has developed a training centre for minimally invasive surgery with sponsor from TWGHs. With its future development in minimally invasive surgery and robotic, it is expected that KWH will also serve as a training centre for clinicians from other hospitals and services

Ambulatory Centre Component

- Though a proportion of patients may prefer to stay in the hospital for longer post-op care, it is anticipated that day surgery will grow significantly
- At present, some of the day surgery cases are conducted at OLMH. This will need to be reviewed with the functioning of the ambulatory centre
- The day surgery should preferably stand alone with a different team of staff from the main surgical theatre
- Hepatobiliary surgery is going towards minimally invasive approach with some suitable to be performed in ambulatory setting
- A combined Endoscopic Centre with other specialties will fit in very well with the ambulatory setting
- There are rooms for developing same day surgery in ambulatory centre

Demand Management

- A substantial proportion of surgical inpatients will be shifted to day patient care in future

Design Issues

- Specific designs are required for day surgery facilities at the ambulatory day centre

Part II – Ambulatory Care Service and Specialties Provided by Specialists from Other Institutions

The specialties outlined here are, in alphabetical order:

- Dental Service
- Dermatology
- ENT
- Family Medicine and General Outpatient Clinic Service (FM & GOPC)
- Ophthalmology
- Psychiatric Service



Dental Service

The Dental service in KWH is mainly provided on an outpatient basis. The service is supported by dental surgeons from the Department of Dental and Maxillofacial Surgery of the United Christian Hospital.

Dermatology Service

Dermatology service provided in specialist outpatient clinic is supported by dermatologists from the Yaumatei Dermatological Clinic which is operated by the Department of Health.

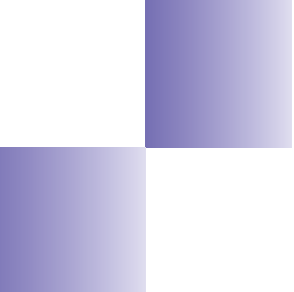
ENT Service

ENT service in KWH is supported by the ENT department of Yan Chai Hospital. There are acute ENT beds and outpatient ENT sessions available at KWH. Apart from the usual ENT service, ENT surgeons are also involved in reconstruction after head and neck surgery as well as operations involving posterior cranial fossa with neurosurgeons. There are also joint consultations with paediatricians for assessment of suspected Obstructive Sleep Apnoea Syndrome. Significant changes in the mode of service delivery are not expected after the redevelopment of KWH.

Family Medicine & General Outpatient Clinic Service (FM & GOPC)

The FM & GOPC service includes general outpatient clinic, staff clinic, family medicine clinic, chronic disease clinic, diabetes shared care clinic and Integrated Clinic. It also runs collaborative service for diabetic patients together with the Medicine and Geriatrics Department as well as a nurse-led complication screening clinic for diabetic and hypertensive patients.





The service collaborates with the Chinese University of Hong Kong in research project. It also supports TWGHs social service by providing medical and rehabilitation support to elderly people under the enhanced home and community care service.

There are plans for further development of chronic care model in primary care setting potentially under enhanced collaboration with non-government organisations (NGOs). The recommended model will involve: (i) multidisciplinary team care to provide early identification and intervention of complications, (ii) developing disease-specific protocols to facilitate proactive care, and (iii) empowering patients and their family to take care of their chronic conditions. The aim is to provide comprehensive and proactive care for chronic disease patients.

Ophthalmology Service

Ophthalmology service in KWH is supported by Ophthalmology team from Caritas Medical Centre (CMC). There is no acute ophthalmology bed in KWH but inpatient consultation sessions are nonetheless available at the hospital. Outpatient services are provided at CMC. Significant changes in the mode of service delivery are not expected after the redevelopment of KWH.

Psychiatric Service

Psychiatric service in KWH is provided by the Consultation Liaison Team from Kwai Chung Hospital. There is no inpatient psychiatric bed in KWH but the team provides psychiatric consultation service to adult inpatients as well as supports geriatric day service. There is also limited psychiatric liaison service in A&E, with psychiatric assessment conducted by psychiatrists 3 days per week while overall liaison is provided by a psychiatric nurse.

With the enhancement of A&E and the establishment of Emergency Medicine (EM) ward in the redeveloped hospital, it is recommended that psychiatric liaison service in A&E be strengthened, with special emphasis on its EM ward. Limited short stay psychiatric inpatient service could also be considered to serve patients that require short term service beyond 48 hours.



Role Delineation

In this section clinical services of KWH are classified into various levels using the role delineation model. The levels range from 1 to 6, each with a defined level of support services, staff mix and other requirements as set out in the role delineation definitions of Table A.

Presented in Table B is the role delineation of clinical services at KWH. It is applied using a broad-brush approach, and is meant to provide a quick reference and an overall picture rather than for meticulous comparison.

KWH services in 2009 are delineated according to their existing levels of service, while the figures for 2016 and 2021 are recommended levels based on the key recommendations outlined in the previous section for each specialty. The analysis is based on the assumption that the roles of the other four surveyed hospitals will not change in relation to the redevelopment of KWH.

Most of the clinical services of KWH are at level 6 and are recommended to remain so in future. It is also recommended not to change the role delineation of psychiatry, ophthalmology and ENT, which are currently at level 3/4 or 4/5. The exceptions will be neurosurgery service and paediatric service. With the inception of the Centres of Excellence in Neuroscience and Paediatrics, in future a significant proportion of the most complicated management will be carried out at the two Centres. Therefore, most neurosurgery and paediatric services, including those at other hospitals, will be no higher than level 5/6 by 2016 and beyond. The other changes in role delineation are for non-radiation oncology which is currently not provided by KWH. It is recommended that a level 4 non-radiation oncology service be provided at the rebuilt hospital by 2016.

Table A. General Guidelines for Clinical Services Role Delineation

MEDICAL			SURGICAL		
Generalist	Type I Subspecialties	Type II Subspecialties	Generalist	Type I Subspecialties	Type II Subspecialties
Physician	<ul style="list-style-type: none"> • Cardiology • Dermatology • Endocrinology • Gastroenterology • Geriatric Medicine • Neurology • Renal Medicine • Rheumatology • Venereology • Paediatrics • Respiratory Medicine 	<ul style="list-style-type: none"> • Clinical Haematology • Clinical Microbiology • Immunology • Medical Oncology • Palliative Care • Radiotherapeutic Oncology • Genetics • Clinical Infectious Diseases 	• General Surgeon	<ul style="list-style-type: none"> • Ear, Nose and Throat • Obstetrics and Gynaecology • Ophthalmology • Orthopaedics • Urology 	<ul style="list-style-type: none"> • Cardiothoracic • Neurosurgery • Plastics Surgery • Transplant Surgery • Vascular Surgery • Burns

LEVEL OF SERVICE – INPATIENT SERVICES

Nil No service available

- 1 Outpatient care – Registered Nurse (RN) and visiting General Practitioner (GP).
- 2 Outpatient and inpatient care – plus 24-hour GP cover and limited visiting general specialists for outpatient services only
- 3 Outpatient and inpatient care – plus visiting general specialists (low risk obstetrics and elective surgery)
- 4 Outpatient and inpatient care – plus resident general specialists plus visiting Type I subspecialists, plus some junior medical staff
- 5 Outpatient and inpatient care – plus visiting Type II subspecialists plus some medical staffing plus HDU. May include some research and training
- 6 Cluster-wide services, including Type II subspecialists and research/education/training

LEVEL OF SERVICE – AMBULATORY CARE SERVICES

Nil No service available

- 1 GP only
- 2 GP and outpatient clinic at discharge hospital. Limited access to community nursing
- 3 Visiting specialist. Some hospital avoidance/substitution/early discharge services. Access to community nursing and some allied health services
- 4 Increasing range and complexity of hospital avoidance/substitution/early discharge services. Chronic disease programs. Visiting medical specialist. Good access to generalist allied health/nursing staff
- 5 Specialist medical/nursing/allied health staff. Increased range and complexity. Enhanced diagnostics. Teaching and training role
- 6 Research role. Fully integrated ambulatory care services. Fully integrated diagnostics

Adapted with permission from Western Australia Department of Health, "WA Health Clinical Services Framework 2005-2015", 2005. Please refer to the original document for detailed definitions of the different levels of service of individual specialties.

Table B. Clinical Services Role Delineation of KWH (Level 1 to 6)

Clinical Service	Year		
	2009	2016	2021
A&E	6	6	6
Anaesthesia	6	6	6
Non-radiation Oncology	Nil	4	4
ICU	6	6	6
Medicine & Geriatrics	6	6	6
Neurosurgery	6	5/6	5/6
Obstetrics & Gynaecology	6	6	6
Orthopaedics & Traumatology	6	6	6
Paediatrics	5/6	5/6	5/6
Pathology	6	6	6
Radiology	6	6	6
Surgery	6	6	6
Cardiothoracic Surgery	Nil	Nil	Nil
ENT	4/5	4/5	4/5
Family Medicine & GOPC	5/6	5/6	5/6
Ophthalmology	3/4	3/4	3/4
Psychiatry	3/4	3/4	3/4
Rehabilitation	Nil	Nil	Nil
Tuberculosis & Chest Unit	Nil	Nil	Nil

Note: The role delineation of clinical services is for quick reference and provision of an overall picture only.

Traditional Chinese Medicine

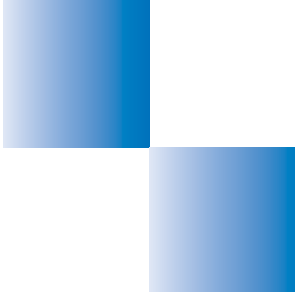


KWH has been running a Traditional Chinese Medicine (TCM) Outpatient Clinic that includes bone setting and acupuncture with the support from TWGHs. At present the service is mostly confined to outpatient services with limited integrated inpatient care only provided through the Department of Integrative Medicine.

Integrative Medicine Service

The Department of Integrative Medicine is where TCM combines with Internal Medicine, Surgery, Paediatrics, Orthopaedic Surgery and Gynaecology. There are 15 acute beds for integrative medicine in KWH distributed in different clinical departments and 2 outpatient sessions per week. The service provides traditional Chinese herbal medicine, Acupuncture and Naprapathy (massage). The current service is supported by the TWGHs and there are joint researches with the Chinese University of Hong Kong.

With a Chinese Medicine Wing in the rebuilt KWH, TCM will have its own presence on the campus with identifiable clinics and research facilities, as well as dedicated inpatient facilities. However, wherever feasible, multidisciplinary clinics should include TCM practitioners.



In fact, there are rooms for collaboration with TCM in many different clinical specialties. With its long tradition, reputation and strength in TCM, KWH can provide good opportunities to explore the different types of collaboration models. The medical staff of KWH are observed to be generally positive to this development. Potentials for further collaboration are identified across different specialties, examples include the following:

(a) Accident & Emergency (A&E) Service

Opportunities for collaboration should be most evident for patients with bone and joint injuries where advice from bone setters is often sought by patients at the moment.

(b) Anaesthesia

The aspiration of the department to develop an integrated pain centre will benefit from collaboration with TCM, especially in the area of acupuncture for pain relief. Acupuncture anaesthesia is another area worth further exploration as the technique should be particularly useful for patients who need to remain conscious during surgical procedures.

(c) Medicine & Geriatrics

TCM will be particularly useful in palliative care for cancer patients and patients with renal failure. TCM could also play a significant role in the management of patients from general internal medicine. In fact, early models of integrated management have been developing. Research on the role of TCM in clinical practice is also going on.

(d) Neurosurgery

Acupuncture is expected to play a significant role in stroke and neurological rehabilitation. Many patients are already seeking similar treatments in the community.

(e) Orthopaedics and Traumatology (O&T)

There are substantial experience and success with the existing joint TCM diabetic foot program. Further collaborations are also expected in the treatment of minor injuries by bone setters, and acupuncture for chronic musculoskeletal pain like chronic low back pain.

(f) Family Medicine & General Outpatient Clinic Service (FM & GOPC)

There are already pilot integrated primary Western-Chinese Medicine outpatient clinics as well as services for musculoskeletal disorders. There are further plans to organize integrated primary care health talks for commonly seen problems like skin problems and degenerative musculoskeletal disorders.

(g) Pathology

An authentic Chinese Medicine laboratory has been established in KWH with the support from TWGHs. This can serve to further strengthen the scientific basis of TCM. The service is complementary to the introduction of integrated Western/Chinese Medicine Service in KWH.



(h) Surgery

Many surgical patients will seek TCM support especially during the post-op recovery phase.

(i) Dietetics

Collaboration could be developed in the development of TCM related Chinese food recipes as health supplement or to aid recovery.

(j) Physiotherapy

There are plans to integrate TCM in comprehensive pain management by physiotherapists. Some physiotherapists in KWH are actually registered TCM practitioners and accredited to perform acupuncture.



Principal Recommendations

The Project Team recommends that the KWH continue its role as a major district hospital. The daily demands of the emergency presentations and the consequent admissions will dictate that a comprehensive range of clinical services are required to support this role. This conclusion may seem trivial but it is fundamental to the outcome that an acute general hospital be rebuilt on the site.

The existing suite of services is expected to continue. The major addition will be the development of non-radiation oncology services. This and other principal recommendations are set out below.

Flexible Space Utilization

The capacity planning has indicated that the bed capacity will not change significantly. Demands from population growth and changes in the age structure of the population will be offset by changes in models of care discussed throughout this report, that is, more services in an ambulatory setting and decreased length of stay for those that do need overnight admission.



Having said this, the design and usage of ward spaces needs to be more flexible. At the moment some clinical areas, internal medicine and geriatrics in particular, are constantly occupied in excess of 100%. However, overall occupancy is significantly less than this. This is a familiar pattern and results from rigid bed allocation to specific teams and disciplines. Hospitals of the future will have far more flexible accommodation spaces and the notion of the specialty-based ward will be phased out.

Ambulatory Centre as a Centrepiece

The symbolic representation of the new KWH will be the ambulatory centre. It will be the cultural and clinical centre of the hospital. The ambulatory centre will be the point of contact for most of the community engaging with KWH.

The range of services that can be conducted from the ambulatory centre is extensive:

- Day surgery
- Day procedures
- Chemotherapy
- Haemodialysis
- Endoscopy
- Pain clinics
- Non-radiation oncology clinics
- Nutrition, Occupational Therapy, Physiotherapy, etc.
- Multidisciplinary diabetes services
- Electrophysiology
- Coronary angiography /angioplasty
- Electro-diagnostic Medical Unit
- Cardiac respiratory rehabilitation
- Imaging services i.e. ultrasound, CT, MRI, etc.




For the moment the plan is to retain the traditional *one on one* outpatient clinics in the existing building on the Dundas Street frontage (Tsui Tsin Tong Out-Patient Building). The master plan should provide for good articulation of the outpatients with the ambulatory centre.

Development of Non-radiation Oncology Services

Rationale

The most significant deficiency identified by the review and highlighted by almost every clinical group consulted lies in oncology. However, cancer represents a significant proportion of the work at KWH. Patients present from A&E with (usually late) manifestations of the underlying malignancy. Many patients being investigated for a variety of reasons prove to have malignant lesions. The Well Men's and Well Women's clinics conducted by the TWGHs produce a steady but predictable clientele of asymptomatic cancers detected by various screening techniques.



In the initial phases these patients are investigated and managed by the KWH clinicians. However, the transition of care to either chemotherapy or radiation based management is not always optimal.

This issue is crucial to the integrity of this report. One option, the immediate (primary) referral of these patients to one of the two referral hospitals in Kowloon (QEH and PMH) is not entirely feasible considering the substantial number of patients involved.

Recommended Model

This report recommends the establishment of non-radiation oncology service at KWH. The appointment of an oncologist in conjunction with one or both of the oncology centres in the Kowloon West Cluster and Kowloon Central Cluster, that is, PMH and / or QEH will greatly enhance the service.

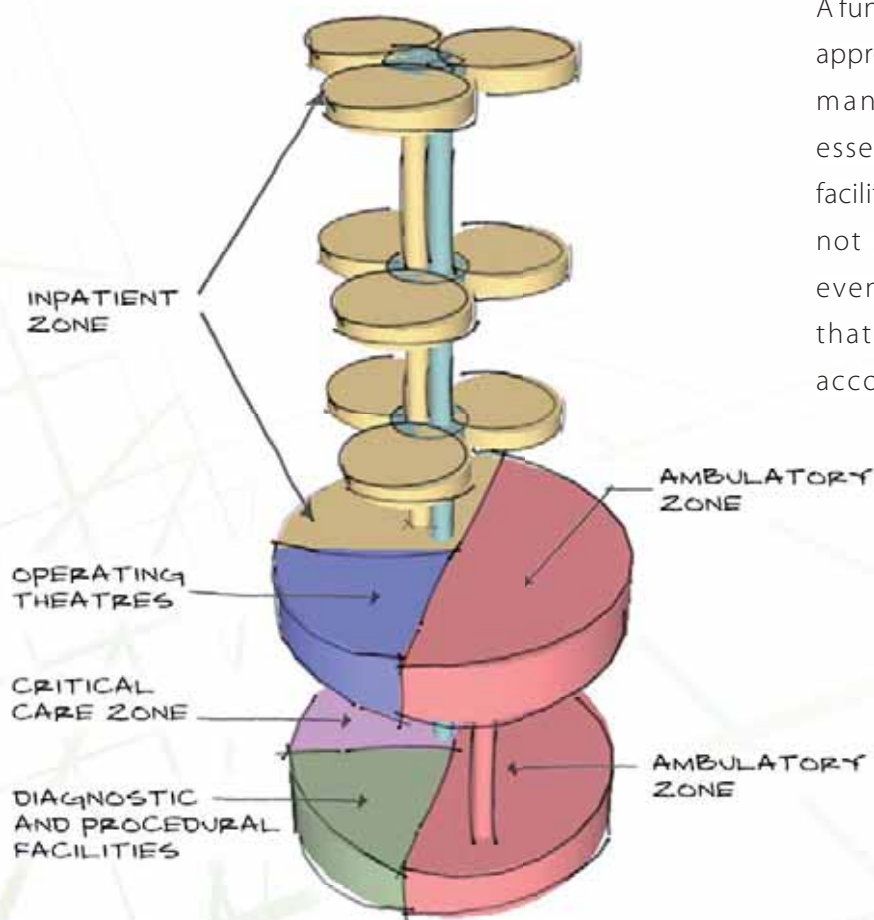
There is a territory-wide working party which determines the number and distribution of linear accelerators across HA hospitals. Since concentration of expertise and technology is known to be more cost effective for radiation therapy, it is unlikely that a satellite unit at KWH will be established.

The newly established non-radiation oncology team would provide front line management, consultation services and management of chemotherapy programs, particularly in the ambulatory centre and most importantly, linkage with radiation therapy centres to ensure both access and continuity of care for KWH patients.

It goes without saying that linkages with palliative care and end of life programs are critical to the cancer service. Traditional practitioners, pain specialists and many other disciplines need to be involved in the full spectrum of care for cancer patients. At the moment this continuity of care is not present at KWH although its creation is compatible with the ambitions of the management and clinical teams and is entirely complimentary to the stated objectives of ambulatory care, integration of traditional medicine and a true and visible community focus.

Design Implications

The cut-off point between the clinical services plan, strategic planning and master planning is not always clear. A continuum is a far more appropriate concept. However the changes to models of care and methods of clinical practice recommended in this report do have important implications for design.



A fundamental concept is a zonal approach to campus layout and management. The concept essentially refers to planning facilities around clinical activities, not around wards or beds or even specialties. This means that the areas are classified according to their functions such as ambulatory zone, diagnostic zone, inpatient or accommodation zone (wards), and so on. The *zonal* model groups patients and clients around their needs and not the discipline that owns them.

Conventional Hospital Designs

In recent years development of major hospitals has been around a collection of wards. Historically this stems from the ward being the visible manifestation of a particular discipline, not to mention the demarcation of their *patch*. The end result of this process is often favoured by physicians as it concentrates their immediate needs in one distinct area. Clinical care, inpatients, outpatients, specialty clinics, diagnostics, administrative offices, teaching and research can all be contained within the one area.


The model is largely designed for the convenience of staff. They can come to work knowing that all their modalities are within the sphere of their immediate influence. In its ultimate manifestation, this model includes dedicated intensive care units and even operating theatres within a zone that is owned by one particular discipline. The creation of *fiefdoms or hospitals within hospitals* can lead to professional isolation, inconvenience for patients, and more importantly, unacceptably low levels of utilization of facilities including beds, theatres and technologies.

Ambulatory Zone

The case for the creation of an ambulatory zone is irrefutable. Each day thousands of patients utilize the facilities of KWH with only a small percentage requiring admission and an overnight stay. The site is constrained but its major advantage, proximity to the MTR station on one corner of the campus, should be exploited. During master planning the option of a direct underground tunnel link should also be explored.

The ambulatory centre will be the community and cultural focus of the hospital. Ideally it should be a radical departure from the western hospital paradigm that dominates the Hong Kong hospital architecture. There is no need for a western hospital paradigm clinically and the arguments favour an environment that will be received by the community as receptive and healing.





A large floor plate with multiple mezzanine levels would be ideal. Child care, food outlets and education areas could also be incorporated. A modern shopping plaza is a good conceptual start. However the ambulatory centre should also be a clinical services area. It is intended to be client friendly whilst still offering the highest levels of technology and sophistication. It goes without saying that the ambulatory centre would be a wireless, paperless and filmless environment. The intention will be defeated if clients are required to transfer to another part of the campus that does not have the same level of utility and amenity.


The specialist outpatient services are designated to remain in the Tsui Tsin Tong Out-Patient Building on Dundas Street frontage. The ambulatory centre should have large rooms suitable for multidisciplinary clinics and case conferences. The master plan should also provide for future integration of the clinics with good access to procedural areas and diagnostic facilities.

The location of the Tung Wah Museum, the geographical centre of the campus, represents a challenge for designers. However this constraint can also become a catalyst for innovation.

Critical Care Zone

Under the models of care proposed here a critical care zone should be identified. Such a zone will optimise access issues and enable the less intense areas of the hospital to be *locked down* out of hours. This will enable a concentration of resources in the critical zone.

The proposed critical care zone will be crucial for the ultimate success of the campus. Vehicular approach is currently problematic for the A&E services. The new A&E requirements for multiple areas which are time specific and house particular categories of patients are a design challenge. High visibility of patients, flexibility of staff and a high level of responsiveness all need to be considered. Staff amenities are important in areas where personal stress is endemic. All critical care areas need appropriate respite / time out facilities for staff. Facilities for concerned / grieving families / counselling are a must.



Like many hospitals that have evolved, KWH has pockets of high dependency beds scattered over the hospital. All international evidence would suggest that a coalition of these beds in one critical care zone is not only efficient but produces better outcomes. This is not to say that individual HDUs cannot remain under the direct supervision of their own discipline, however, benefits lie in co-location and the concentration of skills and technology. Diversity of clinical skills and professional background can also be shown to enhance outcomes.

If all ICUs / HDUs and the like are co-located with the A&E and its associated units an acute zone, a focus for critical care can be achieved. The location of the zone on the campus will be difficult but certainly worthy of detailed consideration.

Diagnostic and Procedural Facilities

Another design alternative is to master plan the imaging department to have a physical relationship with the ambulatory department and for that matter the critical care zone. Such design will avoid expensive duplication, and in some cases, enhance access to expensive technologies.


Day surgery facilities, endoscopy suites, ante-natal diagnosis suites, etc. should all be designed with maximum amenity from the *front of house* perspective but can share facilities with the *back of house*. There is no doubt that day facilities for surgery are now a major imperative. Integration with the *main* theatre complex has little to offer (except an inefficient day surgery service).



Inpatient Zone

Given that the rebuilt KWH will have approximately 1,000 beds, the location and configuration of the inpatient spaces will be crucial. The *inpatient* zone will almost certainly be in a tower block. Many of the *beds* will be associated with other zones (ambulatory, A&E, critical care, etc.). However there is still likely to be a need for 600 to 700 beds in a tower block.

Two important developments in hospital planning may inform this decision. Firstly large floor plans, which offer a 60-bed ward are very much in favour. The beds are often configured on a tri-radius basis, that is, 3 pods of 20. At the core are the services and work areas with the beds distributed circumferentially. This is an economical configuration for staff. It is not simply two wards of thirty beds with two complete sets of staff.



The other advantage of the tri-radiate design is the capacity to lock down entire pods at off peak periods. The second observation is the accumulative inefficiency of building higher and higher hospital ward blocks. It is not the same as high rise hotels. Travel distance, travel spaces and travel times in a hospital are subject to the law of diminishing returns.

The existing culture of bed and floor ownership will need to be reviewed for this concept to work. Many clinicians will only focus on their beds and their wards. The model pursued in this section will negate these old values. A community focused hospital with ambulatory care being a focus and the campus laid out on a zonal model is a very different concept and one we encourage all to embrace.

Other Facilities

Traditional Chinese Medicine needs to have its own identity and according to the stated policy be integrated with the general hospital. Given that its function will be largely ambulatory, a physical relationship with the ambulatory centre may be desirable.

Parking and traffic is not *per se* the subject of the review but of necessity impacts on the clinical model. Underground parking may be a partial solution but will cause major disruption and major delays during demolition, excavation and construction. Taxi access will be important and many options with on and off ramps to both ambulatory care and critical care can be explored. These options only have a minimal impact on the floor plate, that is, they can be built above the podium in air space.

Concluding Remarks

The history, traditions and unique culture of KWH and its parent organisation the TWGHs is a legacy that should be carried forward. In 2011 KWH will celebrate its centenary. This Clinical Services Plan sets out to ensure that the next 100 years will begin with leading edge facilities and technologies to support the excellence of the men and women who dedicate their professional lives to this institution.

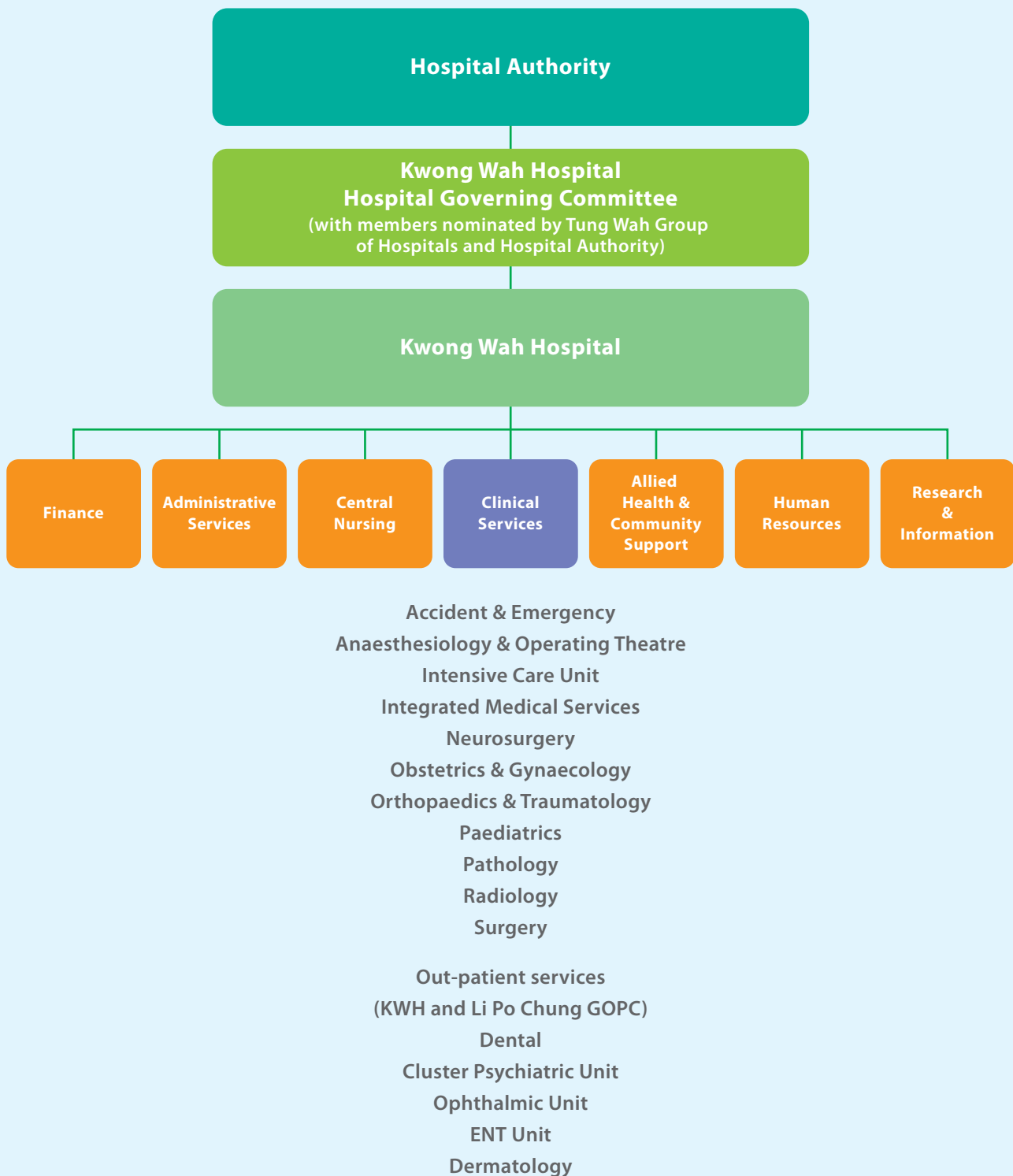


Abbreviations

A&E	Accident & Emergency
ALOS	Average Length of Stay
CT	Computed Tomography
DP	Day Patient
DSA	Digital Subtraction Angiography
ENT	Ear, Nose & Throat
GOPC	General Out-Patient Clinic
HA	Hospital Authority
HDU	High Dependency Unit
ICU	Intensive Care Unit
KWH	Kwong Wah Hospital
MRI	Magnetic Resonance Imaging
NICU	Neonatal Intensive Care Unit
OLMH	Our Lady of Maryknoll Hospital
PMH	Princess Margaret Hospital
QEH	Queen Elizabeth Hospital
SCBU	Special Care Baby Unit
TCM	Traditional Chinese Medicine
TWGHs	Tung Wah Group of Hospitals
WTSH	Wong Tai Sin Hospital

Appendix I

Organisation Chart of Kwong Wah Hospital



Appendix II

Site Map of Kwong Wah Hospital



- AED** Accident and Emergency Department
- CMGOPC** KWH Chinese Medicine General Out-patient Clinic
- KRSC** KWH Chinese University of Hong Kong
Chinese Medicine Clinical Research & Services Centre
- MRI** Magnetic Resonance Imaging Centre

Appendix III

Terms of Reference and Membership of Steering Committee

I. Terms of Reference

The terms of reference of the Steering Committee are as follows:

- (a) To oversee the work of the Consultant Panel and steer the strategic direction for the formulation of a Clinical Services Plan for the redevelopment of Kwong Wah Hospital (KWH).
- (b) To guide the development of a framework which maps out the current services as well as the planned service configuration of Kwong Wah Hospital and other related hospitals in 10 to 15 years' time.
- (c) To receive an interim report on collated survey responses and summary of the face-to-face consultation interviews on the services plan development from the overseas Consultant and the HA Head Office project team.
- (d) To receive the final report from the Consultant Panel and advise on the recommendations on the Clinical Services Plan for KWH redevelopment.

II. Membership

The membership of the Steering Committee is as follows:

Chairman Mr Shane Solomon, Chief Executive of HA

Members A representative from the Board of Directors, Tung Wah Group of Hospitals (TWGHs)[#]
Dr Lawrence Tang, Hospital Chief Executive, Kwong Wah Hospital
Dr Nancy Tung, Cluster Chief Executive, Kowloon West Cluster
Dr C T Hung, Cluster Chief Executive, Kowloon Central Cluster
Dr S V Lo, Director (Strategy & Planning), HA Head Office
Dr W L Cheung, Director (Cluster Services), HA Head Office

[#] Mr Patrick Ma and Dr John Lee represented TWGHs in the Steering Committee as Chairman of the Board of Directors of TWGHs for the year 2008/09 (until 31 March 2009) and year 2009/10 (with effect from 1 April 2009) respectively. Mr Patrick Ma was invited to continue to serve as Steering Committee member after 31 March 2009.

Appendix IV

Key Roles and Membership of Consultant Panel

I. Key Roles

- The role of the Consultant Panel is to give advice, comment and guide the development of the Clinical Services Plan for KWH redevelopment project. The panel members provide input from their respective professional background in the formulation of the plan.
- Meetings were held in January to March 2009 where the Consultant Panel members provided comments on the methodology, study process as well as the key recommendations proposed by the consultancy team on the Clinical Services Plan for KWH redevelopment.

II. Membership

The membership of the Consultant Panel is as follows:

Local Consultants

Professor Joseph J Y Sung
Dr Pamela Leung
Dr Geoffrey Lieu

Overseas Consultant

Dr Peter J Brennan

Convenor

Dr S V Lo, Director (Strategy & Planning), Hospital Authority

Appendix V

Membership of Project Team

The HA Project Team comprises the following members from HA Head Office Strategy & Planning Division:

- Chairman** Dr S V Lo, Director (Strategy & Planning)
- Members** Dr Tony P S Ko, Chief Manager (Strategy, Service Planning & Knowledge Management)
Ms Looi-looi Low, Senior Manager (Strategy & Service Planning)
Ms Wendy Leung, Manager (Strategy & Service Planning)
Mr Raymond Li, Manager (Strategy & Service Planning)
Dr Pauline Woo, Manager (Service Planning Research)
Dr Leo Chan, Manager (Special Projects)
Mr Vincent Ho, Executive Partner (Special Projects)

Hospital executive support is set out below:

- KWH** Mr Steve Chan, Senior Hospital Administrator (General Administration)
Ms L H Chung, Senior Nurse Manager (Central Nursing Division)
- PMH** Ms Echo Yau, Senior Hospital Administrator (Administration & Executive Support)
- QEH** Ms Helen Tang, Senior Hospital Manager (Public Affairs)



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The Strategy & Planning Division

Hospital Authority Head Office

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147B Argyle Street

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Tel: (852) 2300 6555

E-mail: webmaster@ha.org.hk

Website: <http://www.ha.org.hk>

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