National Paediatric Hospital

Ambulatory and Urgent Care Centres For Greater Dublin

RKW, London October 25 2007

“There can be no keener revelation of a society's soul than the way in which it treats its children.”

Nelson Mandela

Contents

1 Introduction

1.1 Purpose of Report

This report describes recommendations with regard to the number and locations of **Ambulatory and Urgent Care Centres (A/UCCs)** in the Greater Dublin area. These recommendations have been developed as part of a Framework Brief for the National Paediatric Hospital (NPH) Tertiary Centre for Ireland which will combine the national tertiary and Greater Dublin secondary services of the three existing children's hospitals in Dublin –

- Adelaide and Meath and National Children's Hospital – Tallaght (AMNCH)
- Children's University Hospital – Temple St (CUH)
- Our Lady's Children's Hospital - Crumlin (OLCHC)

on the Mater Hospital site.

The work was carried out by RKW under a commission from the Health Service Executive (HSE), between January –June 2007. The terms of reference for the Framework Brief included examination of –

- The hospital in the context of a National paediatric services network
- Potential for Ambulatory and Urgent Care Centres in Greater Dublin
- The NPH Model of Care
- Demand and capacity requirements
- Appropriate space standards for a world class tertiary hospital
- NPH size including Education and Research
- The preferred physical configuration of services on the Mater Hospital site.

The Terms of Reference required that the report on Ambulatory and Urgent Care Centres be delivered in advance of the main report. This report has been updated to incorporate discussions which took place via a number of stakeholder workshops in June 2007 which included contributions from international advisers to the project. It is important to note that the Framework Brief is based on high level analyses and

further detailed development in support of the recommendations is required at the next stages when the Development Board is in place to take the project forward.

1.2 Background

The Framework Brief has been developed following **Children's Health First** 'International Best Practice in Tertiary Paediatric Services: Implications for the Strategic Organisation of Tertiary Paediatric Services in Ireland' (the McKinsey Report), which found that *"the evidence for one national tertiary paediatric centre in Dublin is compelling"* and recommended that -

The McKinsey Report and Urgent Care Centres [1]

The (NPH Tertiary) centre would be at the nexus of a integrated paediatric service, also comprising:

Adequate geographic spread of A&E facilities (including 2-3 in Dublin). Treatment at ***'urgent care centres'*** *is another option. These centres are either stand alone or attached to an adult facility with no inpatient children's beds. They should be staffed by general paediatricians. When children need to be admitted, they are transferred to the tertiary centre. The need for transferring is manageable because 85-90% of paediatric visits are discharged to home and ambulances are instructed to take all acute volume directly to the tertiary centre.*

In addition to Urgent Care our terms of reference include consideration of **Ambulatory Care** – including outpatient services and both surgical and medical day care - consistent with the principle of "***safe care as locally as possible"*** *(Building local, safe and sustainable services for Mid and West Wales: The Case for Change. NHS Wales, 2006).*

1.3 Principles

While much attention has been given to the location and physical aspects of the National Paediatric Hospital, it is important to recognise that the McKinsey recommendations were for "an integrated paediatric **service** (RKW emphasis)". Within what is firstly a **service** model, where physical location and co-location are means to an end, it is necessary and relevant also to consider which services may be **decentralised**, consistent with the overarching principle of safe services delivered as locally as possible.

In support of this principle the Ambulatory and Urgent Care Centres (A/UCCs) –

- Should be clearly part of the NPH Tertiary Centre brand, governance, education and training and quality assurance
- Should provide services and environments of the same quality as those delivered at the Tertiary Centre
- Should not dilute the critical mass, which the Tertiary Centre requires (the McKinsey report recommended that the NPH Tertiary Centre should contain **sufficient**, not all, secondary activity [2])
- Should provide demonstrable advantages, for example in terms of access or support to the national network, over location of services at the Tertiary Centre
- If located on adult hospital sites should provide child friendly services and accommodation to the same standard as the Tertiary Centre.

Key questions to be addressed in this report are -

What is the evidence in support of A/UCCs for paediatric services from International Best Practice?

What range and volume of outpatient, day case and urgent care services could potentially be delivered in A/UCCs? What services and support facilities should the centres include?

What are the potential and preferred locations for A/UCCs? What are the access and travel time consequences of alternative siting options?

What are the advantages of locating A/UCCs on an Adult Hospital site?

2 The National Network

2.1 National Network Model

Any A/UCC models will be part of a National Network of Paediatric services. A sustainable **national network** of paediatric services will be one which provides an appropriate balance between services provided within the NPH Tertiary Centre and those delivered in local hospitals and other settings, supported from the centre via outreach, telemedicine, joint appointments and staff rotation and continuous professional development as described in Figure 1.

This shows the NPH Tertiary Centre as the nexus of a national paediatric healthcare system containing –

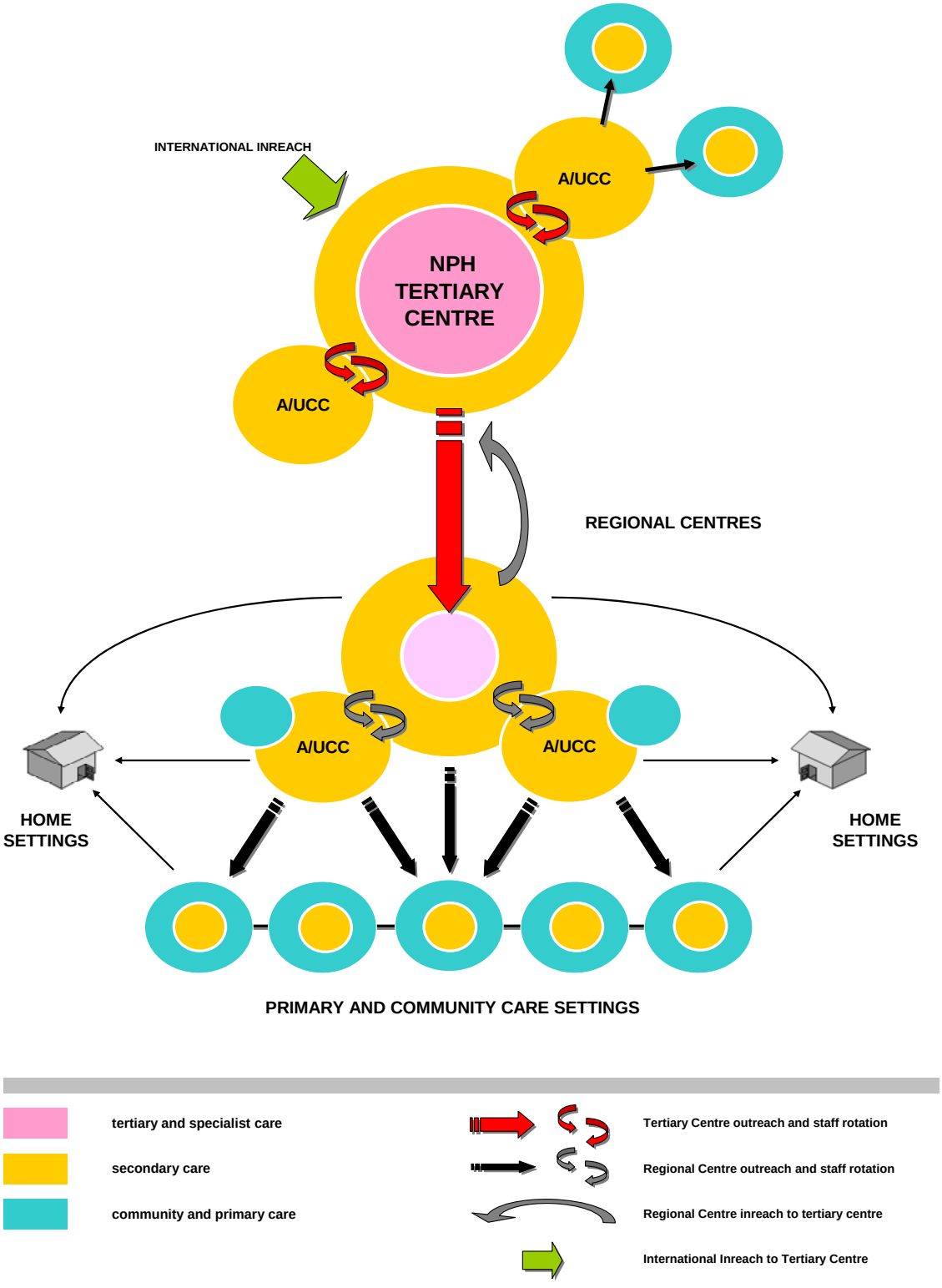
- Designated regional hospitals providing secondary inpatient, day and outpatient care
- Regional, and designated local hospitals and other healthcare facilities hosting outreach clinics from the NPH Tertiary Centre
- Extended use of telemedicine from the NPH Tertiary Centre and from regional centres to provide expertise and advice to local care providers
- Periodic rotation of staff between the NPH Tertiary Centre and regional and local hospitals to develop, maintain and exchange skills
- Whole system protocols and patient care pathways supported by information technology, electronic patient records and decision support systems branded from the NPH Tertiary Centre to ensure consistent high quality care in local settings
- A comprehensive transfer and retrieval service coordinated from the NPH
- Education and training networks aligned to the service model

Further analysis of activity, workforce and infrastructure requirements will be necessary to determine the detailed configuration of services in the new model and a key challenge will be to avoid over centralising resources which would constrain the development of local services. Important considerations will include -

- The extent and pace at which general paediatrics and community paediatrics will develop and how this will influence the capability of local services
- How to develop and sustain local expertise and support for comparatively rare conditions which will occur infrequently in any locality
- The future location for surgery on children under 5 years of age
- The nature of Critical Care which can be appropriately provided in other hospitals
- Building local capabilities for earlier transfer of patients on long-term ventilation
- How far local day case services can substitute for those currently provided in the Children's Hospitals for non Dublin residents and whether there is scope for A/UCCs linked to regional hospitals
- The suitability of physical infrastructure in local hospitals to receive patients from the NPH Tertiary Centre, (for example the availability of single rooms to accommodate patients vulnerable to cross infection)
- Identifying the best practice elements of different outreach models operated by the current Children's Hospitals and integrating these into a cohesive network
- Enabling effective sensitive and flexible transfer of patients to the care of local Adult Service when they reach maturity
- More local day services, for example day chemotherapy
- Ensuring that A/UCCs help support the development of primary and community paediatrics (and avoiding the risk that A/UCCs de-skill primary care)

- Workforce planning co-ordinated across the national network to avoid competition between institutions and sectors for scarce skills.

Figure 1 National Network Model



2.2 Transfer and Retrieval Services

Following recommendations in a joint report by the Faculty of Paediatrics and the Irish Standing Committee, Association of Anaesthetists of Great Britain and Ireland (Care of the Critically Ill Child in Ireland, February 2005) a national paediatric retrieval service is to be established. The report recommended that this service, and the existing neonatal retrieval service which operates from 0900 – 1700 should be a 24 hour, 7 day week service and plans to extend the operational hours for the neonatal service are being progressed. This provides the opportunity for an integrated service, under a single management structure to be introduced in advance of, and anticipating, a single National Paediatric Hospital. The service will be an important component within the national network linking regional and local hospitals and the ambulatory and urgent care centres to the NPH Tertiary Centre.

2.3 Education Training and Research

The National Paediatric Hospital will be the lead centre for paediatric education and training and research and through these activities will have a key role in generating the workforce which it, and other paediatric services require, and creating the intellectual environment which will help to attract, retain and develop high quality staff across all disciplines. International experience, national policy and local stakeholder opinion converge in supporting the integration of education and research activity within the National Paediatric Hospital which should include both a multi-disciplinary education centre and learning and resource facilities localised within clinical areas. The Ambulatory and Urgent Care Centres should also include, or have access to, appropriate facilities of comparable quality.

3 Demand and Capacity at the NPH Tertiary Centre and A/UCCs

To determine the capacity required for the National Paediatric Hospital and the A/UCCs we have -

- Reviewed and updated the McKinsey bed projections
- Forecast other key functional content
- Verified the data provided against local estimates
- Projected the impact of demographic change to 2021
- Modelled system reform, productivity and specialty specific effects
- Reviewed current inpatient performance against best practice
- Identified scope for ”enhanced performance”, supported by system redesign
- Applied occupancy and throughput targets.

A more detailed account is included in the main report for the Framework Brief. A summary of the outcome relevant to the A/UCCs is given here.

Projected **day case requirements** in 2021 are in the order of 65 day beds for medical and surgical patients.

Projected **outpatient attendances,** on the basis of demographic, other growth and enhanced performance to 2021 (**before** outreach to local hospitals, outside Dublin and the Greater Dublin A/UCCs) are 196,700. Future capacity requirements in numbers of consult exam rooms have been estimated on the basis of throughput and availability assumptions detailed in the main report.

Operating theatre and procedure room requirements for 2021 have been projected from inpatient and day case activity . When specialist hospitals (Cappagh, Eye and Ear), under 5 surgery and a proportion of 16-18 year olds are included, the total projected number of day surgical procedures in 2021 for the Tertiary Centre and A/UCCs combined is 17,000 day cases **(Note that this is a subset of overall surgical and medical day cases which will total 28,700)**. This generates a requirement, on the basis of the utilisation and performance assumptions, of 8 day theatres or procedure rooms.

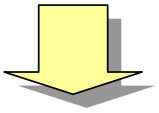
An overview of the activity modelling outcome for ambulatory services is shown in Table 1. This is based on HIPE data for 2005 which have been validated against local sources.

Table 1

Activity for 2005 ,<16 for Greater Dublin

	OLCHC Crumlin	CUH Temple Street	AMNCH Tallaght	Other Dublin Hospitals	TOTAL
Day Cases	11,196	4,853	3,589	2,197	**21,835**
Consultant Outpatients	72,802	46,989	30,097	7,587	**157,475**
A&E attendances	28,900	49,700	31,700		**110,300**

Data include referrals from outside Greater Dublin
Outpatients excludes DNAs and non-consultant clinics



Activity projected 2021 <16 for Greater Dublin

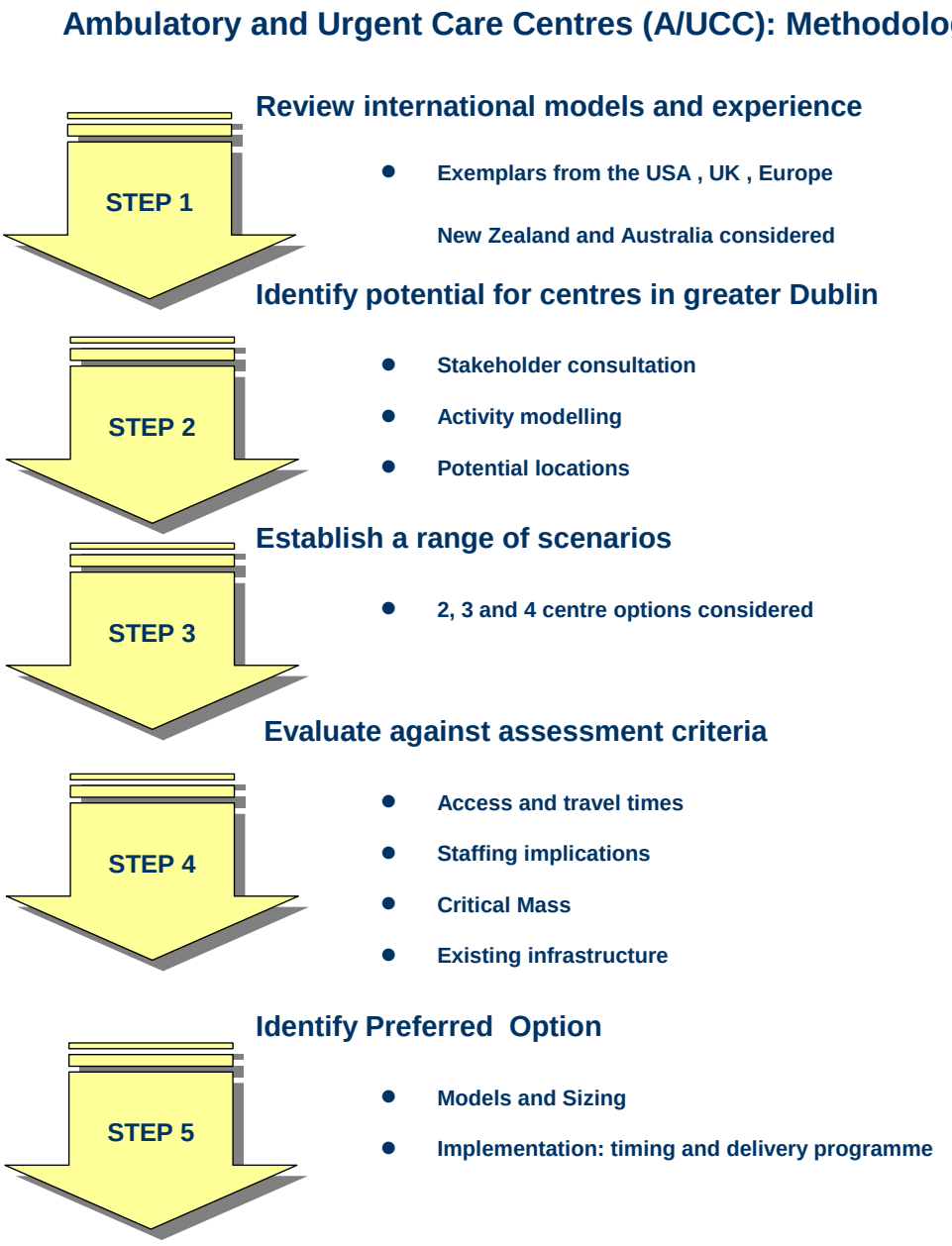
	NPH Tertiary Centre and A/UCCs
Day Cases	**28,700**
Consultant Outpatients	**168,100**
Non-Consultant Outpatients	**28,600**
A&E attendances	**110,300**

4 Ambulatory and Urgent Care Centres: Potential for Greater Dublin

4.1 Methodology

The methodology for the development and evaluation of A/UCC options consisted of the key steps described in Figure 2.

Figure 2 Methodology



Firstly, a review of international approaches to ambulatory and urgent care was conducted via interviews with International clinical advisers and information provided from a further 14 reference sites (see section 4.2.1). The suitability of ambulatory and urgent care centres for Greater Dublin was explored through analysis of activity data, identification of locations with the potential to improve access and consultation with local stakeholders. A range of scenarios with different site combinations was evaluated in terms of access, staffing viability, critical mass and available infrastructure to identify a preferred option and an implementation strategy.

4.2 Step 1 International Experience

4.2.1 International Advisers and Reference Sites

As part of the Framework Brief exercise we have engaged international advisers from three leading Children's Hospitals -

The Hospital for Sick Children Toronto

Dr Hugh O' Brodovich, Senior Medical Adviser

Cathy Sequin, Vice President International Affairs

John Wedge, Orthopaedic Surgeon

The Children's Hospital of Philadelphia (CHOP)

Madeline Bell, Senior Vice President

Manchester Children's Hospital

Dr Richard Newton, Consultant Paediatric Neurologist

In addition, we have contacted 14 children's hospitals worldwide as reference sites as detailed in the map below in Figure 3. Examples of ambulatory and urgent care from 10 of these are discussed below and detailed in Appendix 1. We have also met with over 260 local stakeholders from the three Children's Hospitals, Medical Schools and other agencies in Ireland.

Figure 3 International Reference Sites

4.2.2

Tertiary paediatric centres worldwide have successfully devolved ambulatory and urgent care to both free-standing and adult hospital sites. Some models from the International reference sites and others are described in Appendix 1. Some specific examples and experience are summarised below.

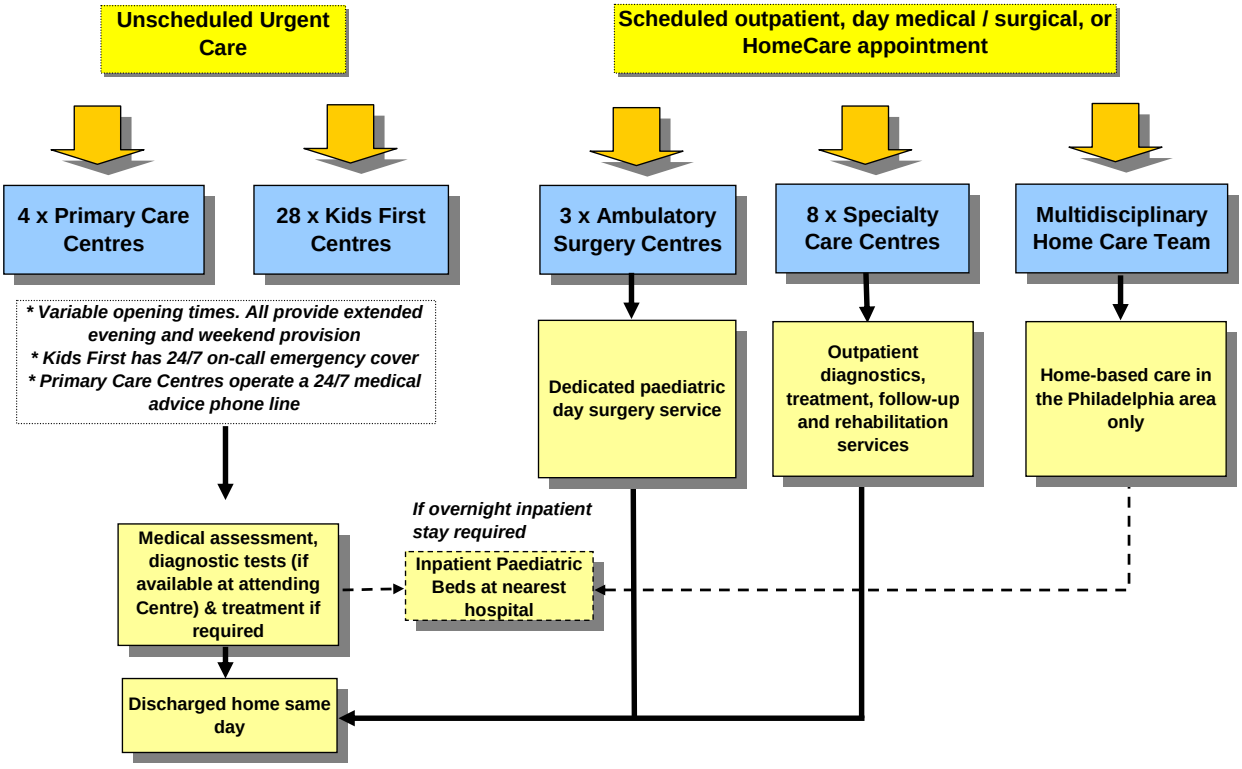
> *'If freestanding urgent care centers are staffed and equipped properly and have appropriate triage, transfer and transport guidelines, the safety of children using these services for emergencies can be protected'*
>
> **American Academy of Pediatrics**
> Committee on Pediatric Emergency Medicine[3]

The Children's Hospital of Philadelphia (CHOP) professes to be the first dedicated children's hospital in the US and has been ranked the best in the country by Child Magazine for the last four consecutive years. CHOP provides ambulatory care in 8 specialty care centres and surgery in 3 of these as described in Figure 4. In addition there is a stand alone Ambulatory Care Centre (ACC) on the main campus. Surgical teams rotate from the main hospital to the ACC's whose resident nursing staff will have worked on the main campus. Two centres include haematology/oncology day services for children initially diagnosed at the main campus. The centres incorporate nurse-administered sedation with support available from paediatrically trained anaesthetists. The availability of electronic patient records is regarded as a key factor in the success of CHOP's ACCs. Children undergoing surgery in the ACCs are carefully selected and only 2 transfers to the main campus (via helicopter ambulance) have occurred since 1994. CHOP does not co-locate ambulatory and urgent care, the latter being provided across 28 primary care centres.

"All children are diagnosed at the main campus and have a choice of follow up there or at an ambulatory center. Physicians love going to the ambulatory care centers (they are) closer to home and it's easy to park" (Madeline Bell)

Figure 4

The Children's Hospital of Philadelphia (CHOP), Pennsylvania

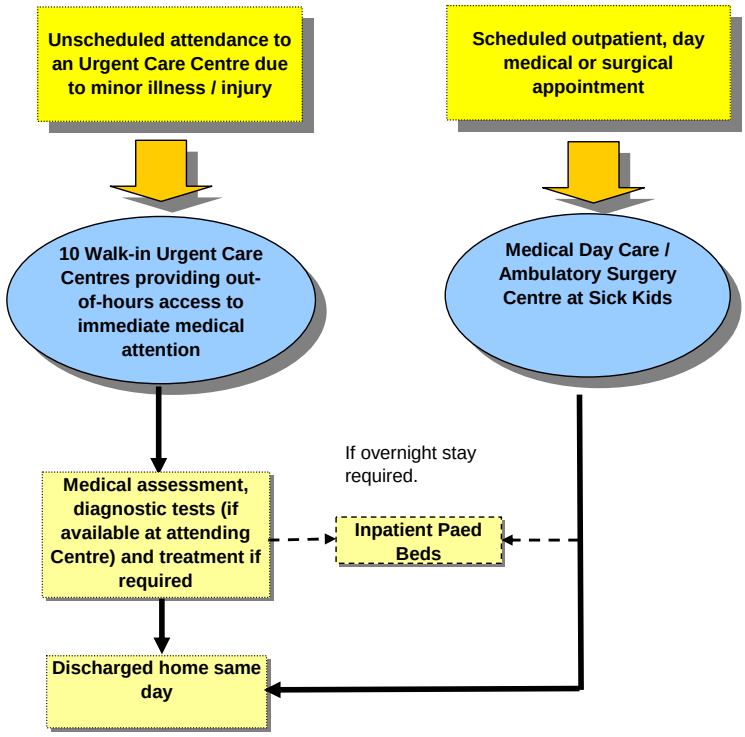


The Children's Hospital in Toronto (Sick Kids) operates within a network in which large volumes of urgent and secondary care are provided away from the tertiary centre. Some centres provide whole day access and others are open for urgent care in the afternoon through to the evening. This, it is felt, strengthens, rather than dilutes the centre by establishing an infrastructure to deliver safe care more locally, recognising that large volumes of secondary activity do not need to access the tertiary site. This is achieved through the use of information technology, joint appointments, and training and support, led from the centre. This may be particularly relevant to Dublin, given the relative under development of community paediatricians. The A/UCCs could provide the bridge between secondary and community and primary care, supporting the development of local self sufficiency and providing a base for community services such as child protection.

"Surgical day procedures could be provided (in an ambulatory care centre) as long as they did not require Intensive Care Unit post-operatively (and with) a maximum of approximately 4-6 hours recovery period duration" (Hugh O'Brodovich)

Figure 5

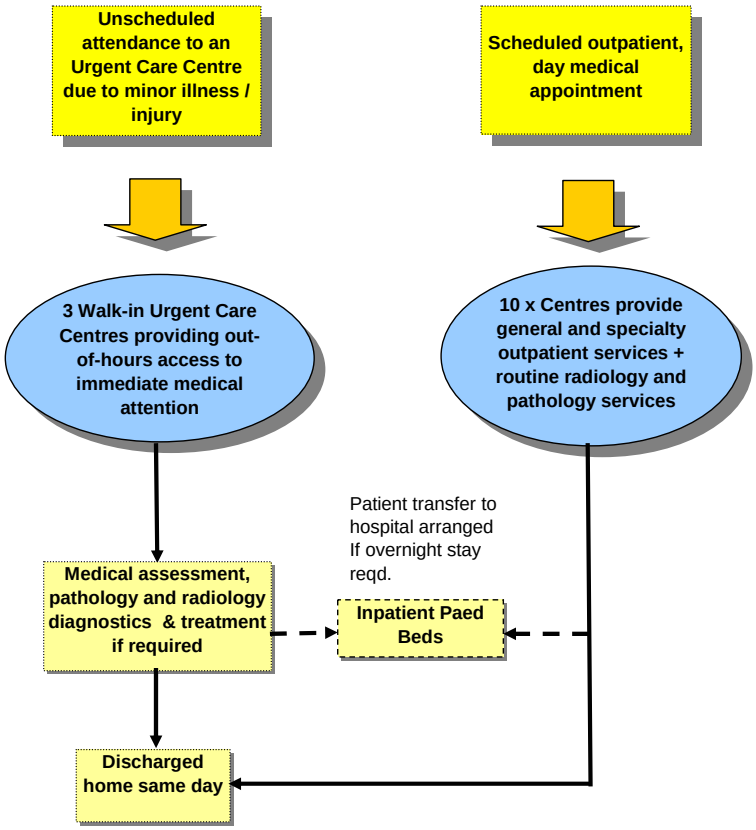
The Hospital for Sick Children (Sick Kids), Toronto, Ontario



Cincinnati Children's Hospital provides outpatient clinics and diagnostic services in 10 clinics as described in Figure 6. Three are effectively both Ambulatory and Urgent Care Centres, dealing with minor illnesses and injuries that need immediate attention. These provide the scheduled outpatient clinics during office hours reverting to the unscheduled urgent care element during out-of-office hours: 6pm-11pm weekdays, 12pm-7pm Saturday, 11am-7pm Sunday and closed during public holidays. Seven other centres provide a range of services associated with ambulatory care such as specialty outpatient clinics and diagnostics. One centre provides day surgery and two provide MRI.

Figure 6

Cincinnati Children's Hospital Medical Centre

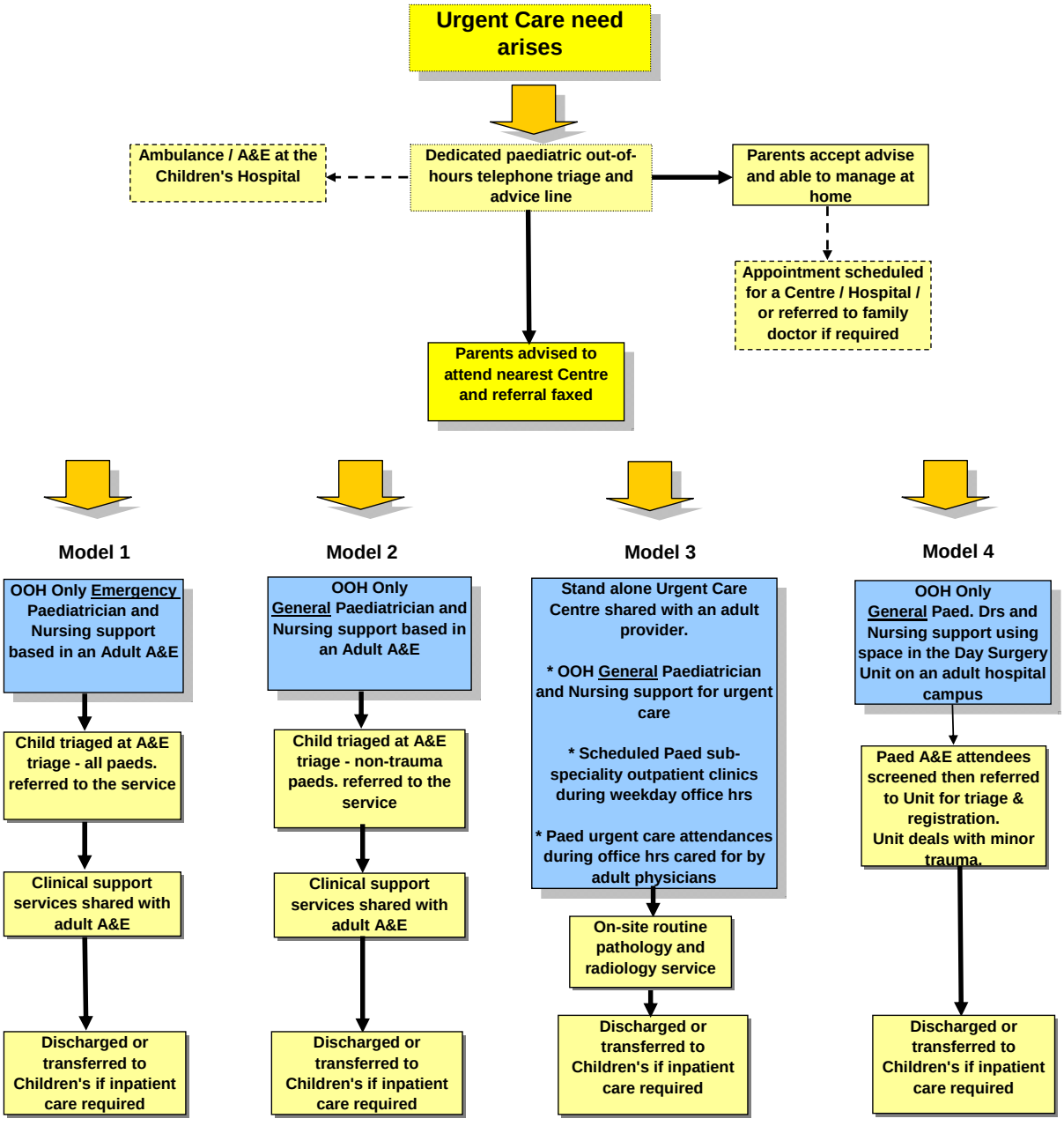


Denver Children's Hospital provides off-site Urgent Care under four different models as described in Figure 7. All sites in the PUCN (Paediatric Urgent Care Network) are staffed by the children's hospital and are linked via an out of hour's telephone triage and referral advice service managed by trained nurses working with dedicated protocols. All centres access on-call specialists by telephone if required. In 2001, the network managed 37,000 attendances with minor trauma, ear complaints

and viral illnesses accounting for 70% of visits. A total of 2.2% of visits required admission or transfer [4].

Figure 7

The Children's Hospital Paediatric Urgent Care Network, Denver, Colorado



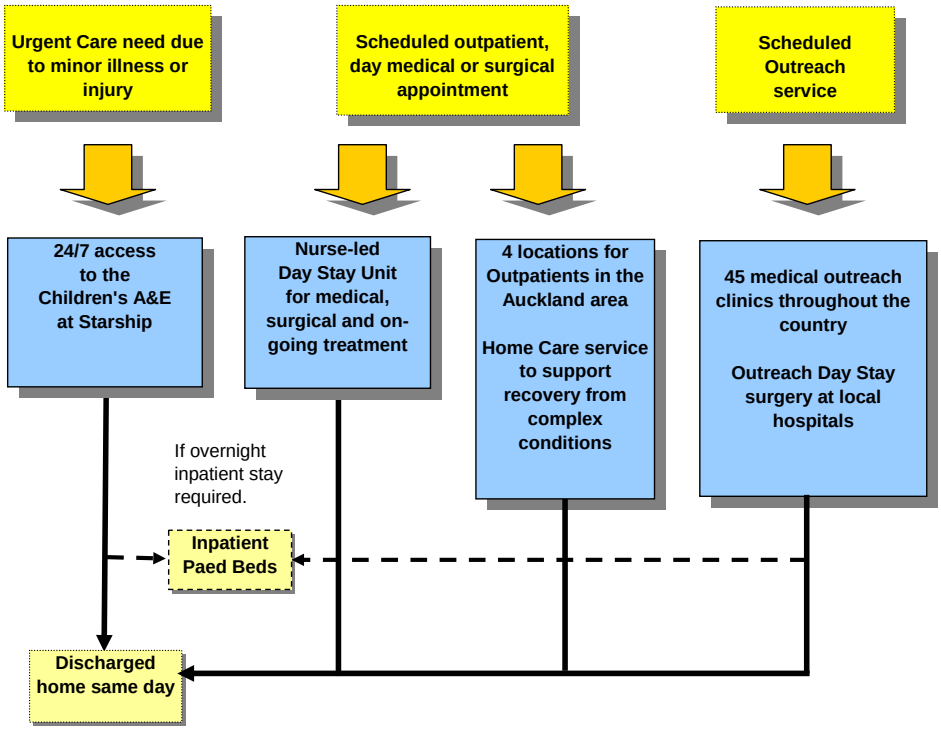
OOH = Out of Hours, 5pm to 1 am.

Starship Children's Hospital (Auckland, New Zealand) is the national paediatric hospital located on the Auckland City Hospital site whose outreach services aim for care closer to home, easier transport and parking for families, optimum use of expertise, improved theatre utilisation and reduced waiting times. Clinics for the

Auckland region are provided at 4 different locations including the Starship and approximately 45 medical outreach clinics are provided in localities throughout the country by visiting paediatric specialist teams as described in Figure 8. Outreach surgery services are also provided at peripheral hospitals. Starship is part of the New Zealand TelePaediatrics Service that links remote sites with medical centres using videoconferencing facilitating paediatric evaluations, updates, education support and knowledge sharing.

Figure 8

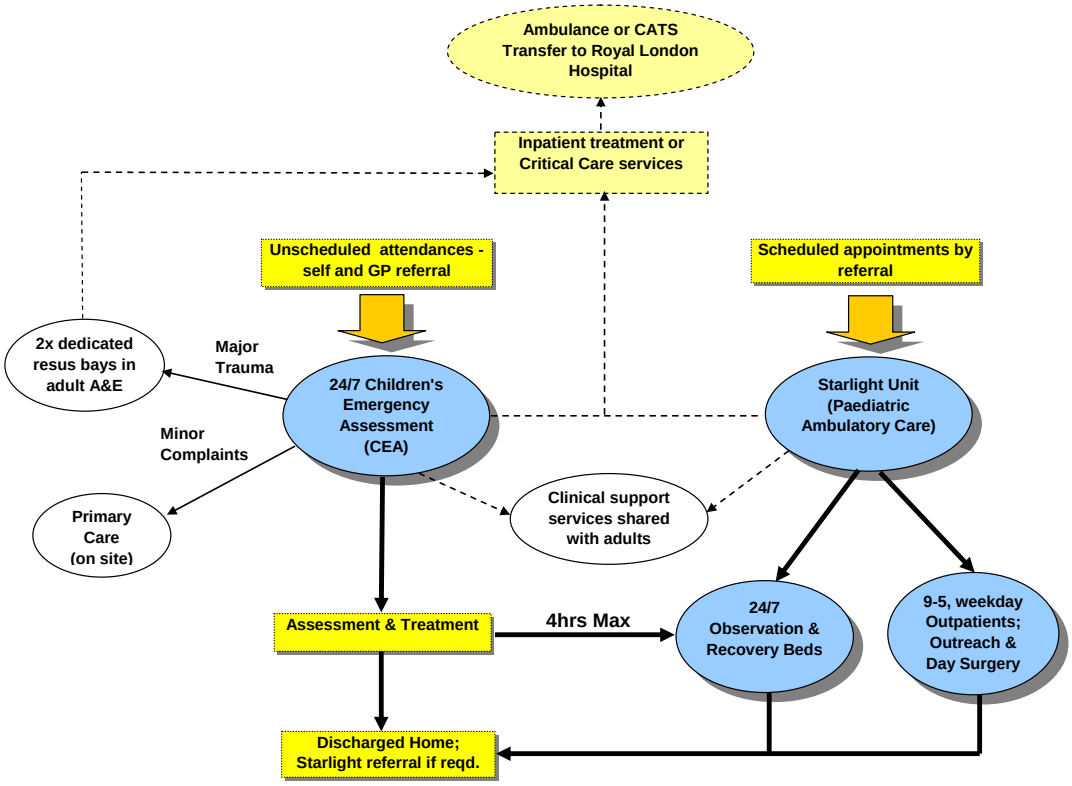
Starship Children's Hospital, Auckland, New Zealand



At **Homerton Hospital , London** a Children's Emergency Assessment Unit (CEA) provides 24/7 urgent care on an adult hospital site (see Figure 9). The CEA includes short stay observation beds and is staffed by paediatric nurses, a paediatric SpR and SHO with 24 hour on call Paediatric Consultant cover. The CEA is located close to a Primary Urgent Care Centre (PUCC) and adult accident and emergency department. On the same site, the Starlight Unit provides ambulatory care, including day surgery and outreach outpatient clinics from Great Ormond St, Moorfields and The Royal London Hospitals, and accommodates inpatient short stays of up to 48 hours.

Figure 9

Homerton Hospital: Paediatric Ambulatory and Urgent Care



International Experience - Summary

The international experience reflects a range of approaches to paediatric ambulatory and urgent care in which no single model predominates but which all reflect a continuing trend towards the delivery of care in ambulatory settings. Thus the CHOP SCCs differ from the Sick Kids approach to supporting the development of local providers of secondary care and while both may achieve the same objective, the different financial incentives of their respective health care systems are likely to have been significant. Urgent care models in the USA often operate out of hours only, in a system where paediatric physicians are part of primary care. Thus the urgent care service is, in part, substituting for the primary care available during normal working hours.

There are fewer examples of stand-alone centres in the UK and mainland Europe and, in the case of the former, these are more likely to be accompanied by short stay inpatient beds. The UK models may be in transition from their traditional DGH inpatient focus origins and stand-alone ambulatory care for adults, common in the USA, has developed in the UK in recent years. Whether urgent care and ambulatory care are co-located also varies, both within and between countries. Common themes

may be identified in terms of the importance assigned to consultant-led services, effective information technology, well developed care pathways and protocols and the power of branding in building patient and parent confidence.

" *With a local infrastructure for the same standard of care not all patients have to come to the tertiary centre – it's taken a long time for us to realise this"*
(Cathy Seguin, SickKids,Toronto)

Extract from Pediatric Care Recommendations for Freestanding Urgent Care Facilities [5]

Administrators at freestanding urgent care facilities should ensure that their staff is capable of providing resuscitation, stabilization, timely triage, and appropriate transfer

Freestanding urgent care facilities must be staffed by physicians, nurses, and ancillary health care professionals with the certification, experience, and skills necessary for pediatric basic and advanced life support during all hours of operation.

Triage, transfer, and transport agreements should be prearranged with definitive care facilities that are capable of providing the appropriate level of care based on the acuity of illness or injury of the child.

Administrators at freestanding urgent care facilities must ensure that there is a structured quality-improvement program to monitor and improve care for ill or injured children.

Freestanding urgent care facilities should have and should monitor compliance with policies, procedures, and protocols consistent with those ….in the Emergency Department

Freestanding urgent care facilities should have a policy for disaster preparedness and participate in their community disaster plan.

Committee on Pediatric Emergency Medicine
American Academy of Pediatrics

4.2.3 International Experience: Potential Range of Services - CHOP as a Case Study

While the review of international experience has identified a range of approaches rather than a single model of ambulatory and urgent care it may be useful to examine the CHOP centres as an illustration of the range of services which could be provided.

The next sections provide a description of the services provided in the 3 combined **Specialty Care and Ambulatory Surgery Centers** at Exton, Bucks County and Voorhees.

The range of consultant led **outpatient consultation services** provided in each of the 3 centres is described in Figure 10. The range of services provided differs from centre to centre, with the larger centre at Voorhees providing outpatients across 18 of the total of 19 specialty services provided at the Centres and including haematology and oncology.

The range of consultant **Day Surgery Services** provided in each of the 3 centres is illustrated in Figure 11. This describes the specialties covered and the types of procedures undertaken for sample specialties. There is a high level of consistency across the 3 centres and the service is protocol driven as described below with approved procedures reviewed annually. Some procedures, notably, tonsillectomies are not undertaken currently as day surgery in Ireland. Figure 12 sets the current position in an international context as an example of the more detailed procedure based analysis which will form part of the next stage.

The range of **Investigations and Therapies** provided in each of the 3 centres is described in Figure 13.

CHOP Ambulatory Surgery Center Protocol

Procedures at the Ambulatory Surgery Center limited to those that do not exceed -

- A total of 4 hours operating time
- A total of 4 hour directly supervised recovery

If the surgical procedure requires anesthesia, the anesthesia shall be -

- Local or regional anesthesia
- General anesthesia of 4 hour or less duration

Surgical procedures may not be of a type that -

- Are associated with the risk of extensive blood loss
- Require major or prolonged invasion of body cavities
- Directly involve major blood vessels
- Are emergency or life threatening in nature

Procedures performed in the Ambulatory Surgery Center are limited to approved procedures reviewed annually.

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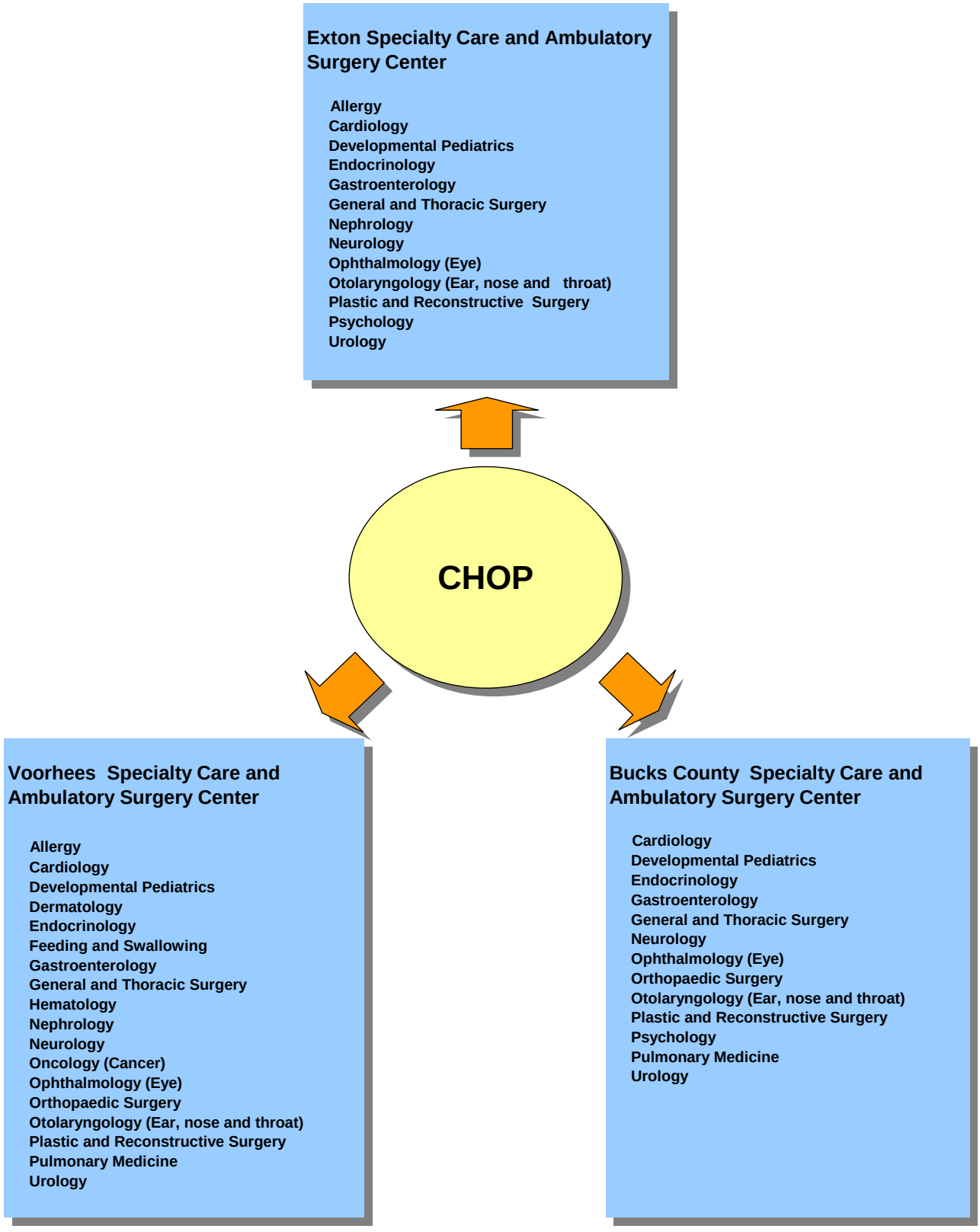
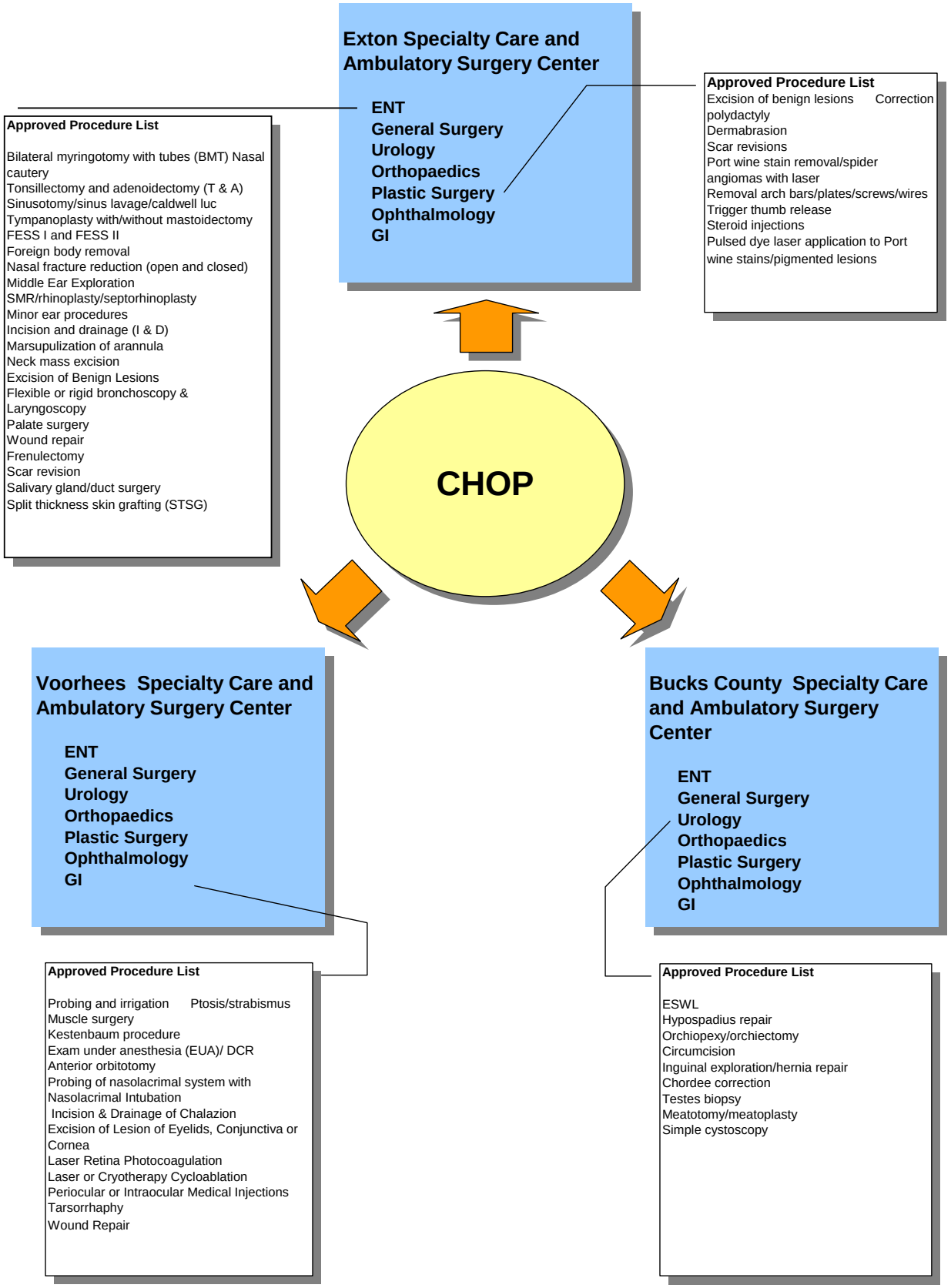
The CHOP models illustrate that a wide range of outpatient and day services can be provided in stand-alone ambulatory settings. The applicability of this or similar models will require further and more detailed analysis at the next stage regarding, in particular –

- Procedure-level activity profiling
- Workforce requirements
- Cost effectiveness and value for money.

CHOP Specialty Care Centres : Outpatient Consultation



CHOP Specialty Care Centres : Day Surgery



Tonsillectomies

Currently a very small percentage of tonsillectomies are carried out as day cases in the three Dublin Children's Hospitals. In 2005 day cases accounted for 11 encounters out of a total of 978 encounters.

There is a significant variance in practice between UK, Europe and the US in day case rates for tonsillectomies. The risk of reactionary haemorrhage is a key consideration.

In leading children's hospitals in the US most T&As are undertaken as day cases in line with T&A Guidelines from the American Academy of Otalaryngology. This is in marked contrast to the UK where an audit in 2003-04 [6] identified a day case rate of 12%. However, the British Association of Day Case Surgery [7] suggests that with proper patient selection the day case rate could increase to 80%.

A report by Salisbury District General Hospital in the UK [8] identified a number of factors that must be considered for this to be a viable option-

- Guidelines for patient selection should incorporate medical and social factors. The percentage of patients who may be suitable will depend on socio-economic factors and geographical distribution

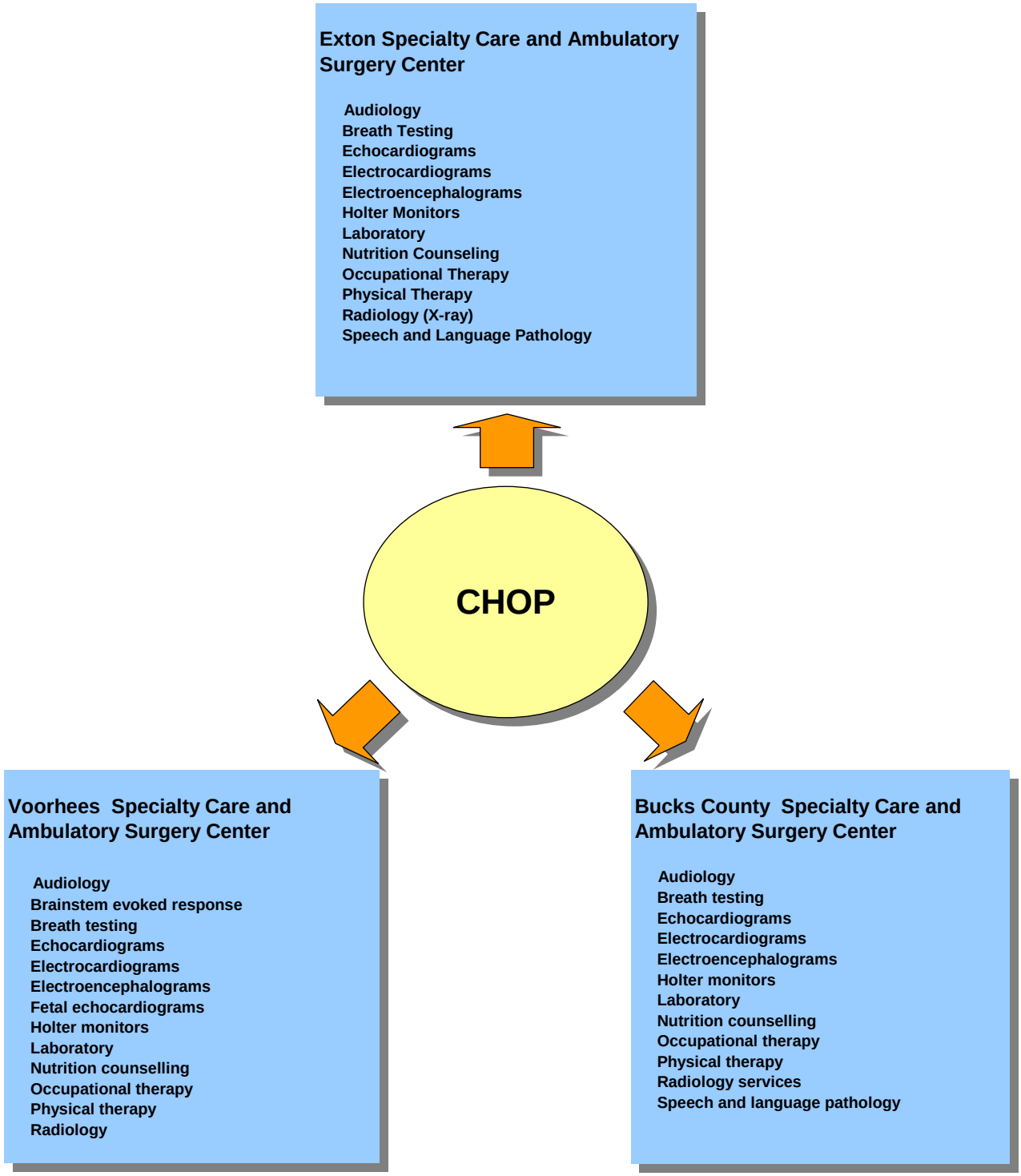
- Patient and parental acceptance of same day discharge plays an important role in establishing the suitability of tonsillectomy as a day case procedure

Other considerations include –

- Establishing clear exclusion criteria
- Developing an appropriate anaesthetic protocol
- Adopting appropriate surgical techniques
- Effective post-operative care focused on discharge
- Ensuring patients are given clear information and instructions on discharge.

With this approach day cases at Salisbury have increased from 50% - 66% in 2003, 4% of children were re-admitted due to bleeding.

CHOP Specialty Care Centres : Investigations and Therapies



4.3 Step 2 : Identify Potential for Centres in Greater Dublin

In considering the potential for ambulatory and urgent care centres in Greater Dublin we have reviewed –

- Projected activity and distribution across A/UCCs, described in section 4.4.2
- The distribution of the Greater Dublin paediatric population – now and in 2021 (Section 4.3.3)
- Comments and issues raised in our consultation process with local stakeholders.

4.3.1 Local Stakeholder Consultation

Views expressed regarding the deliverability and feasibility of A/UCCs range across a spectrum from support in principle to reservations about their feasibility and concerns that they could dilute the tertiary centre's critical mass. The latter perspective is exemplified in OLCHC's management submission (OLCHC, Framework Brief Management Submission 19/04/2006 (ref 9) which expresses -

"…reservations concerning the ability of this urgent care model to function in the specific Irish / Dublin context and is also concerned about the efficacy and efficiency of the elective components." This view is reiterated in the hospitals submission following the stakeholder meetings. (ref 10)

The Irish Association of Emergency Medicine (IAEM) considers Urgent Care Centres as one of a number of options, but concludes that the *"best model … would be for Paediatric Emergency Medicine to be delivered at two fully functional Paediatric Emergency Departments"* (ref 11). This is re-emphasised in a further submission following the stakeholder meetings (ref 12) which notes concerns about the lack of detailed consideration of the needs of secondary paediatric care in Greater Dublin. The IAEM's preferred option (see below), a two-site model each supported by secondary inpatient beds, is outside the terms of reference for this framework brief as set by the Mckinsey recommendations.

A Second Paediatric Emergency Department providing Secondary Paediatric Care (IAEM Preferred Option)

"It involves having a second fully functioning Paediatric Emergency Department on an alternative location in the Greater Dublin area offering a 24-hour service. Such a unit would have to have access to on-site secondary paediatric care. Collaboration between senior doctors and nurses in the ED and the in-patient children's services would ensure optimal functioning of such units. This unit should have the back up of in-patient and short stay paediatric beds."

Paediatric Emergency Services for the Greater Dublin Area. June 2007

A submission from Drs Martin and McKay (Consultants in Emergency Medicine at AMNCH and CUH respectively) endorses a model of urgent care centres without over-night stay beds.

"While it is essential to deliver services to children as close to home as possible, children who are admitted to hospital overnight should be in a unit that can provide the full back up of in-house Paediatrics, surgery, anaesthetics and ICU care…. we fully support the development of the new Children's Hospital and feel it is essential to provide paediatric services, including emergency services, in additional sites we feel it is not in the interest of children to put in place overnight beds in such sites."

Submission from Drs Martin and McKay, October 2007

There is widespread agreement that a critical success factor will be the availability of appropriately skilled staff both based in the centres and rotating from the Tertiary Centre. There is a consensus that this is likely to require additional resources and investment in education and training to generate supply.

Stakeholders emphasised the importance of –

- Comparability between the units and the NPH Tertiary Centre
- Staff rotation and integrated professional development between the A/UCCs and the NPH Tertiary Centre
- Clear protocols regarding the respective roles of the A/UCC and the NPH Tertiary Centre.

and the benefits of –

- Opportunities to link with community and primary care services and to help develop local expertise
- Scope to provide GP access to diagnostics
- Consultant outreach clinics taking place in the A/UCC and thus enabling multi-disciplinary exchange
- Care closer to home.

The report of the Paediatric Emergency Services Network (PSN) [13]identified *"a lack of primary and community based support services resulting, in large numbers of primary care related attendances (at A&Es)".*

The report's recommendations included strengthening links to primary care and general practitioners working on paediatric hospital sites to cater for non-emergency / primary care cases. The A/UCCs might provide a suitable platform from which this closer integration between primary and secondary care could develop.

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4.3.2 Ambulatory and Urgent Care Activity Projections

Urgent Care

For Urgent Care total projected emergency department attendances have been assumed equal to 2006 outturn on the basis that any growth in activity due to demographic change (to 2021) will be offset by developments in primary care and other demand management strategies as outlined below. These may include changes to the management of patients with chronic conditions, many of whom currently access specialist services via emergency departments. It should be noted that current attendances at CUH and OLCHC include patients up to 14 years only.

Emergency Care Demand Management Strategies

- Hospital at Home
- Enhanced primary care
- Telephone support
- Primary care input to emergency departments
- Assessment/observation/clinical decision units
- Local access to diagnostics
- Rapid access clinics
- Improved chronic disease management
- Development of general paediatrics
- Development of community paediatrics
- Development of advanced nurse practitioner roles

Urgent care workload has been allocated to A/UCCs on the basis of triage category which ranks the perceived severity of the patient's condition as shown in Table 2 below. CUH and AMNCH use a 1 (most severe) to 5 (least severe) scale while OLCHC use colour coding from red (most severe) to blue (least severe).

Table 2 Allocation of A&E Activity to A/UCC by triage category

Category	% Attendances to: ED	UCC
New - Not Triaged	100%	0%
New - Cat 1 Triage (red)	100%	0%
New - Cat 2 Triage (orange)	100%	0%
New - Cat 3 Triage (yellow)	20%	80%
New - Cat 4 Triage (green)	0%	100%
New - Cat 5 Triage (blue)	0%	100%
Return Attendances	0%	100%
Total Attendances	**14,600**	**95,700**

This allocation assumes that patients in the most severe categories would attend the tertiary centre emergency department (ED). It is recognised that the initial triage description may not predict subsequent deterioration or co-morbidity and that admission rates may provide an alternative indicator of severity. In 2006 admission rates as a percentage of new attendances were 21% for AMNCH, 18% for OLCHC and 11% for CUH, 16% overall. It is likely that some inpatient admissions could be avoided by more extensive use of observation / assessment units and an internal discussion document summarising a review of paediatric admissions at OLCHC notes *"that many patients could be safely managed without admitting the child to a conventional inpatient facility".* Thus the proportion of patients admitted in 2005 via the emergency departments with a one day length of stay were 34%, 55% and 45% for AMNCH, OLCHC and CUH respectively, 44% overall. If it is assumed that 50% of these admissions could be avoided the combined admission rate for the three hospitals could reduce to 12%.

Analysis of current attendance patterns for the three hospitals (Figure 14) indicates that there is a pronounced peak in attendances at around 21:00 and we have assumed at this stage that the **opening hours** for the Urgent Care Centres should be set to accommodate this. A service operating from 08:00-00:00 would encompass 90% of attendances based upon current arrival patterns. However, as the model develops, consideration should be given to how enhanced primary care may affect attendance patterns and whether this would suggest different opening times.

Ambulatory Care

Table 3 shows the provisional estimate of **day case activity**, which could be undertaken in an Ambulatory Care Centre. This assumes that all secondary day cases could be carried out in an appropriately staffed ambulatory care setting but that 80% of **tertiary** day cases would remain in the NPH tertiary centre. Tertiary day cases are defined according to a DRG based classification of complexity and/or co-morbidity.

Table 3 shows the estimated volume of secondary plus tertiary outreach **outpatient activity** within ambulatory care centres. In the absence of detailed data, outpatient activity has been split between secondary referrals and tertiary on a pro-rata basis with inpatient activity (for Dublin paediatric patients). For secondary outpatient activity we have assumed that 50-100% of new attendances for most specialties and 100% of most returns (with some exceptions) could be seen at the A/UCCs. The outturn outreach component of the secondary activity is 72%, but of this 31% will be provided at the NPH Tertiary Centre for the local population.

For tertiary activity we have assumed that all new appointments would take place at the main NPH Tertiary Centre site with the exception of general paediatrics, surgery and psychiatry. For return attendances we have assumed 50-100% could be undertaken in a satellite location for a number of specialties. Estimated outreach activity for Greater Dublin tertiary care is 38% (of total tertiary work) but, as before 31% will be provided at the NPH Tertiary Centre for the local population. We believe that these are prudent estimates of the activity which could take place in ambulatory settings which should be subject to more detailed analysis in subsequent development stages.

Table 3 Projected activity 2021 indicating tertiary centre and A/UCC split

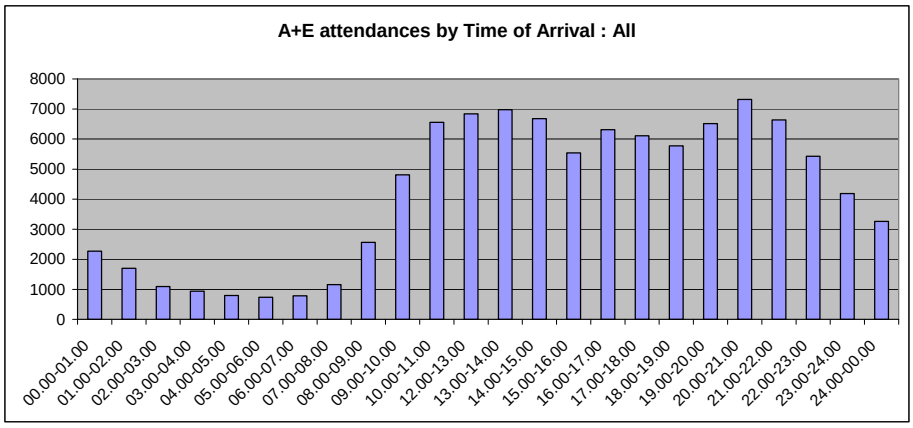
	NPH Tertiary Centre	A/UCCs	TOTAL
Day Cases	10,956	17,744	**28,700**
Outpatients	80,700	116,000	**196,700**
A&E attendances	14,567	95,733	**110,300**

Note : of the total outpatient attendances at the Tertiary Centre a proportion of this will be outreach outside Greater Dublin

Note that A/UCC activity for the local catchment will be provided at the Tertiary Centre

Factors affecting the extent of outreach include –

- Limitations imposed by the need for specialist equipment and diagnostic technology
- Requirements for full multi-disciplinary teams and joint-specialty clinics
- Sufficient volumes of activity for appropriate clinic session frequency (especially applicable to smaller sub-specialties)
- Balancing geographical and temporal access.


A+E attendances by Time of Arrival : All
8000
7000
6000
5000
4000
3000
2000
1000
0
00.00-01.00
01.00-02.00
02.00-03.00
03.00-04.00
04.00-05.00
05.00-06.00
06.00-07.00
07.00-08.00
08.00-09.00
09.00-10.00
10.00-11.00
12.00-13.00
13.00-14.00
14.00-15.00
15.00-16.00
16.00-17.00
17.00-18.00
18.00-19.00
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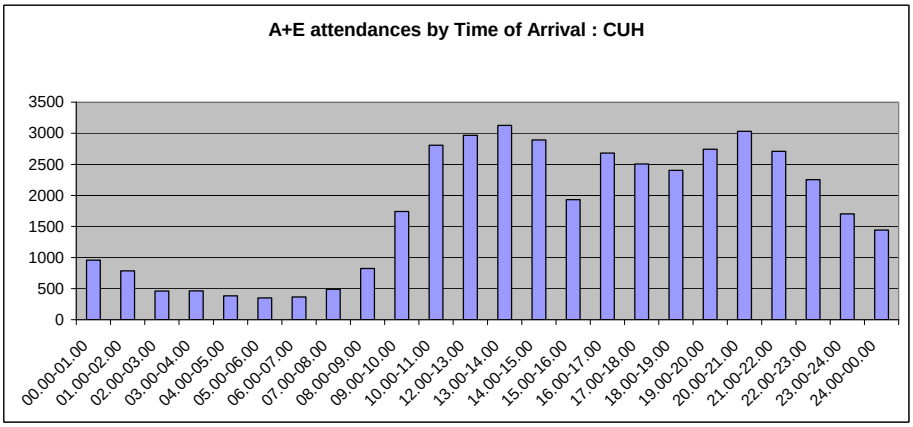
23.00-24.00
24.00-00.00


A+E attendances by Time of Arrival : CUH
3500
3000
2500
2000
1500
1000
500
0
00.00-01.00
01.00-02.00
02.00-03.00
03.00-04.00
04.00-05.00
05.00-06.00
06.00-07.00
07.00-08.00
08.00-09.00
09.00-10.00
10.00-11.00
12.00-13.00
13.00-14.00
14.00-15.00
15.00-16.00
16.00-17.00
17.00-18.00
18.00-19.00
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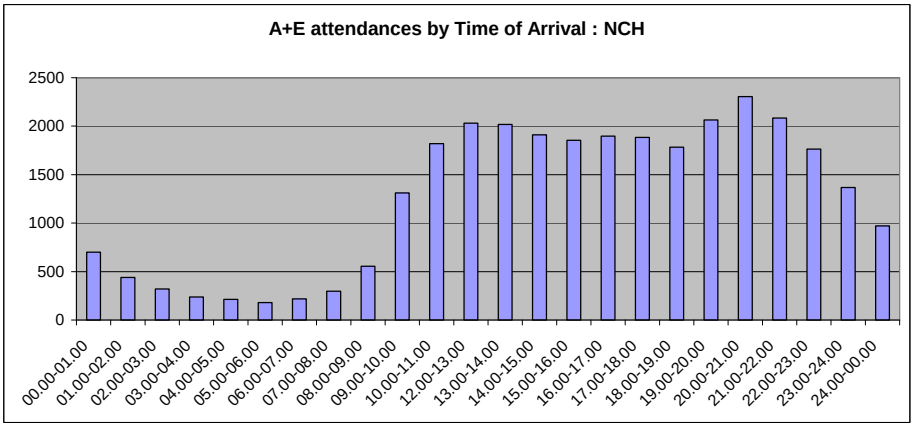
21.00-22.00
22.00-23.00
23.00-24.00
24.00-00.00


A+E attendances by Time of Arrival : NCH
2500
2000
1500
1000
500
0
00.00-01.00
01.00-02.00
02.00-03.00
03.00-04.00
04.00-05.00
05.00-06.00
06.00-07.00
07.00-08.00
08.00-09.00
09.00-10.00
10.00-11.00
12.00-13.00
13.00-14.00
14.00-15.00
15.00-16.00
16.00-17.00
17.00-18.00
18.00-19.00
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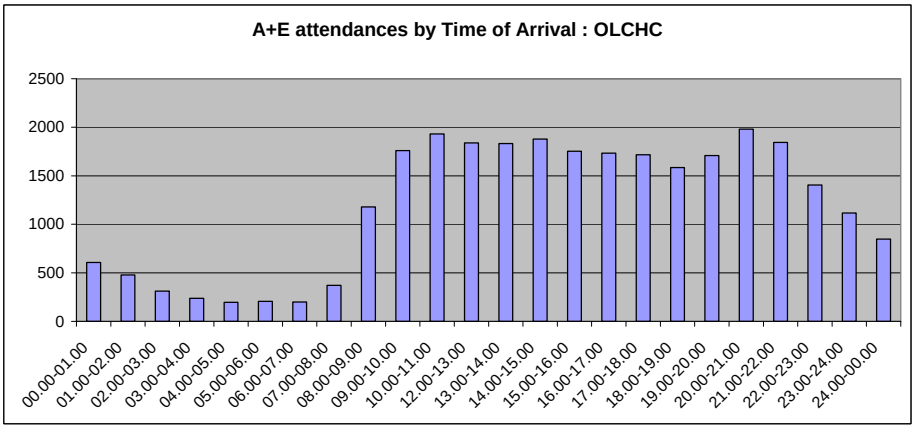
21.00-22.00
22.00-23.00
23.00-24.00
24.00-00.00


A+E attendances by Time of Arrival : OLCHC
2500
2000
1500
1000
500
0
00.00-01.00
01.00-02.00
02.00-03.00
03.00-04.00
04.00-05.00
05.00-06.00
06.00-07.00
07.00-08.00
08.00-09.00
09.00-10.00
10.00-11.00
12.00-13.00
13.00-14.00
14.00-15.00
15.00-16.00
16.00-17.00
17.00-18.00
18.00-19.00
19.00-20.00
20.00-21.00
21.00-22.00
22.00-23.00
23.00-24.00
24.00-00.00

4.3.3 Paediatric Population in Greater Dublin 2021

Potential locations for A/UCC were considered, firstly, in relation to the distribution of the under 16-population as projected to 2021 for Greater Dublin including Wicklow, Kildare and Meath. This is based upon the Central Statistics Office (CSO) estimate using the MIF2 population growth scenario which assumes high external migration. This is illustrated in Figure 14 below which shows on a postcode basis for the Dublin area –

1 The population <16 as a percentage of the total population for that postcode

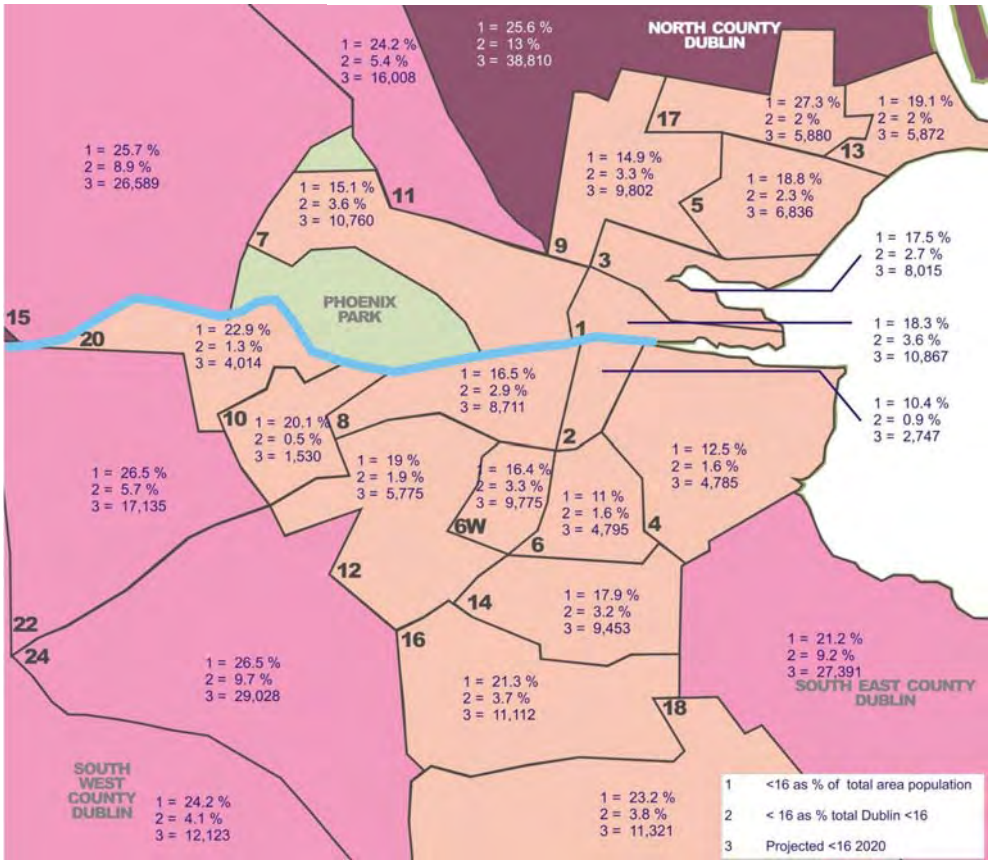
2 The percentage of <16 in that postcode as a percentage of total under 16s for Greater Dublin including Wicklow, Kildare and Meath

3 Total predicted <16 population in 2021.

It is evident from the map, taking all 3 measures into account, that the areas of highest paediatric population in 2021 are grouped in 4 zones –

- North East including North County Dublin
- North West including Dublin 15, Dublin 11 and County Meath
- South West including Dublin 22, Dublin 24 and County Kildare
- South East including South East County Dublin and Wicklow.

Figure 15 Profile of Paediatric Population in Dublin 2021



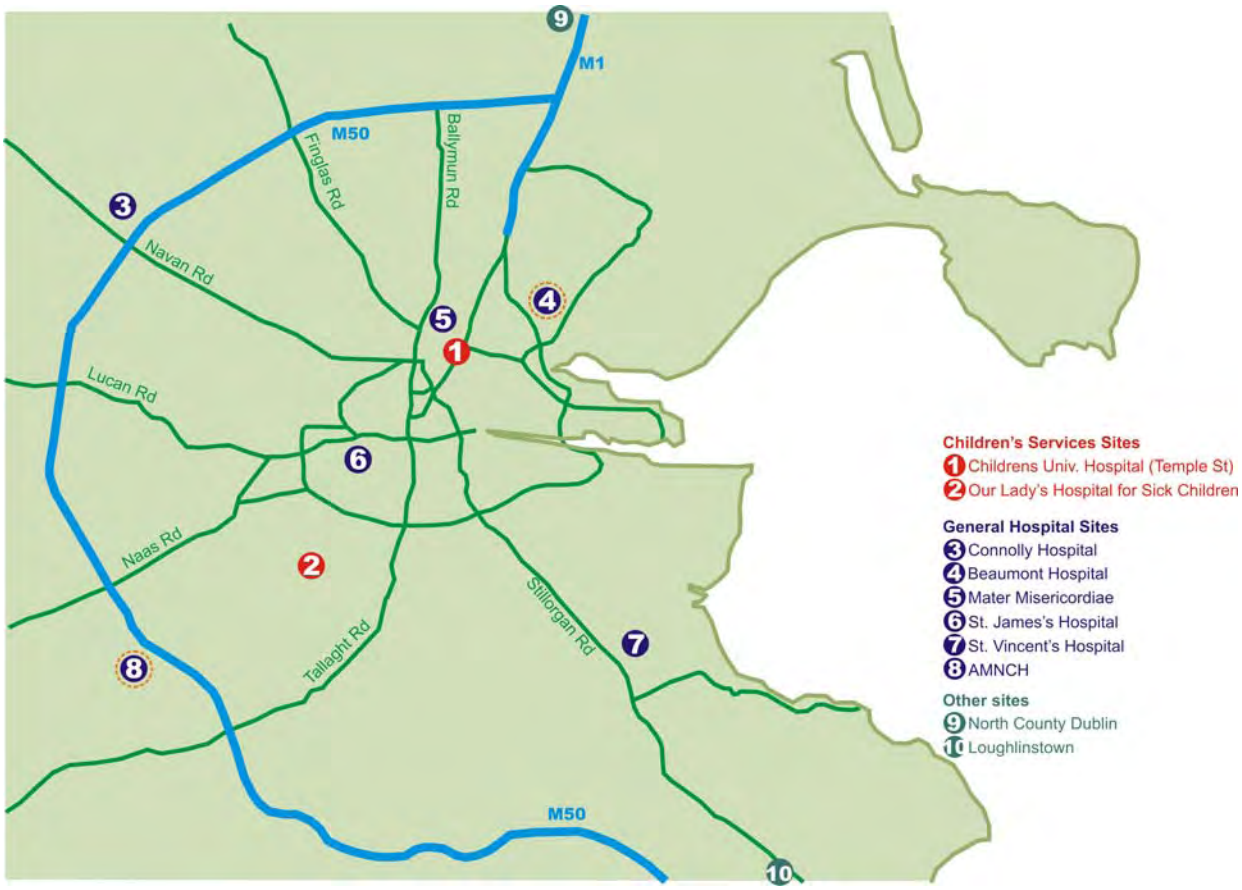
4.3.4 Potential Locations

The population analysis suggests four potential locations for A/UCCs. In identifying potential sites consideration has been given to co-location with existing hospitals and the benefits of access to services, including –

- Pathology
- Pharmacy
- Sterile Services
- Biomedical Engineering
- Facilities Management.

Sites which could provide this infrastructure are shown in Figure 16 and include the 6 Dublin area Teaching Hospitals (DATHs), which had been considered in the original Task Force review of locations for the NPH, and the existing children's hospitals. St Columcille's Hospital in Loughlinstown was identified as a potential site for the South East zone. No site with the appropriate infrastructure was identified for the North East but a notional location in North County Dublin was assumed for the purpose of travel time analysis and Beaumont Hospital was also included in the evaluation.

Figure 16 Sites Considered For A/UCC locations



Of the potential sites, Crumlin, St James and Temple Street were discounted from further evaluation because –

- All are located in areas with comparatively low paediatric populations
- As the Mater site will provide secondary services for the local population, inclusion of St James and /or Temple Street as other city centre locations would not add any access advantage.
- The Crumlin site offered no advantage in access over the 4 sites above for the population of Greater Dublin outside County Dublin and would not, in the long term, have the infrastructure available on the adult hospital sites.

4.4 Step 3 : Establish a Range of Scenarios

Scenarios were generated by considering a range of 2- 4 centre options and site combinations, as shown in Table 4 below.

Table 4 A/UCC Scenarios

A/UCC SCENARIOS	Mater Hospital Site	Tallaght Hospital	Loughlinstown	St Vincent's	North County Dublin	Beaumont	Blanchardstown (James Connolly)
2 Centre Model	●	●					
3 Centre Model 1	●	●	●				
3 Centre Model 2	●	●		●			
3 Centre Model 3	●	●			●		
3 Centre Model 4	●	●				●	
3 Centre Model 5	●	●					●
4 Centre Model 1	●	●	●		●		
4 Centre Model 2	●	●	●				●

These are illustrated in the maps in Figures 17-24.

Allocation of activity to potential locations

In each of the A/UCC location scenarios it has been assumed that patients will attend their nearest centre. On this basis the total volume of activity has been distributed across the centres in each of the scenarios.

Emergency department attendance data provided to RKW do not identify patient origins. As a proxy we have assigned all patients in proportion to the localities of those patients admitted via the emergency departments (for whom source of origin is available). The outpatient data provided to RKW do not identify patient origin and as a proxy, this has been assumed to reflect the distribution for inpatients across Greater Dublin.

This approach implicitly assumes that a full range of day and outpatient specialities would be provided in each centre, when, in practice, it is likely that some specialties might be concentrated in a particular centre with referrals co-ordinated accordingly. The projections should be regarded as identifying broad volumes of secondary and tertiary outreach activity at each location rather than a specialty specific distribution which is for development at the next stage. An example of the CHOP approach to improving access via the structured distribution of services across ambulatory care centres is shown below.

CHOP – Regional Cluster Strategy

- Services offered with *purposeful frequency*
- Designed around discreet geographic regions and modeled for financial sustainability
- Evolving naturally - offering appointments at alternate sites if a requested location is not available

Everyday - somewhere within a cluster	**Multiple** – at least 2xweekly within a cluster	**Weekly –** somewhere within a cluster
Cardiology	Urology	General Surgery
GI	Allergy	Ophthalmology
Neurology	Endocrine	Plastics
Orthopaedics		Developmental paeds
		Dermatology
		Pulmonary

Table 5 illustrates the allocation of activity to each centre, in each option. This is based on the assumed natural catchment populations shown in Figures 17-24. In all scenarios it is assumed that the NPH Tertiary Centre would include the A/UCC activity for its immediate catchment population.

Table 5

A/UCC scenarios applied to OP, DC and Urgent Care activity

	Outpatient Appointments	Day Cases	Urgent care attendances
Total projected activity 2021	196,700	28,700	110,300
Activity at NPH Tertiary Centre	80,700	11,000	14,600
Activity at A/UCCs	**116,000**	**17,700**	**95,700**

Model	A/UCC Location	Allocation of <16 population	Outpatient Appointments	Day Cases	Urgent care attendances
1 Centre Model	**Mater**	100%	116,000	17,700	95,700
2 Centre Model	**Mater**	50%	58,300	8,900	48,100
	Tallaght	50%	57,700	8,800	47,600
3 Centre Model 1	**Mater**	50%	58,300	8,900	48,100
	Tallaght	38%	44,300	6,800	36,500
	Loughlinstown	12%	13,400	2,000	11,000
3 Centre Model 2	**Mater**	50%	57,600	8,800	47,500
	Tallaght	40%	46,400	7,100	38,300
	St. Vincent's	10%	12,000	1,800	9,900
3 Centre Model 3	**Mater**	29%	33,100	5,100	27,300
	Tallaght	50%	57,700	8,800	47,600
	Nth Co. Dublin	22%	25,200	3,900	20,800
3 Centre Model 4	**Mater**	27%	31,500	4,800	26,000
	Tallaght	50%	57,700	8,800	47,600
	Beaumont	23%	26,800	4,100	22,100
3 Centre Model 5	**Mater**	31%	36,400	5,600	30,000
	Tallaght	47%	54,600	8,400	45,100
	Blanchardstown	22%	24,900	3,800	20,600
4 Centre Model 1	**Mater**	29%	33,100	5,100	27,300
	Tallaght	38%	44,300	6,800	36,500
	Loughlinstown	12%	13,400	2,000	11,000
	Nth Co. Dublin	22%	25,200	3,900	20,800
4 Centre Model 2	**Mater**	31%	36,400	5,600	30,000
	Tallaght	36%	41,200	6,300	34,000
	Loughlinstown	12%	13,400	2,000	11,000
	Blanchardstown	22%	24,900	3,800	20,600

Figure 17

Ambulatory + Urgent Care Centres: 2 Centre Model Scenario 1

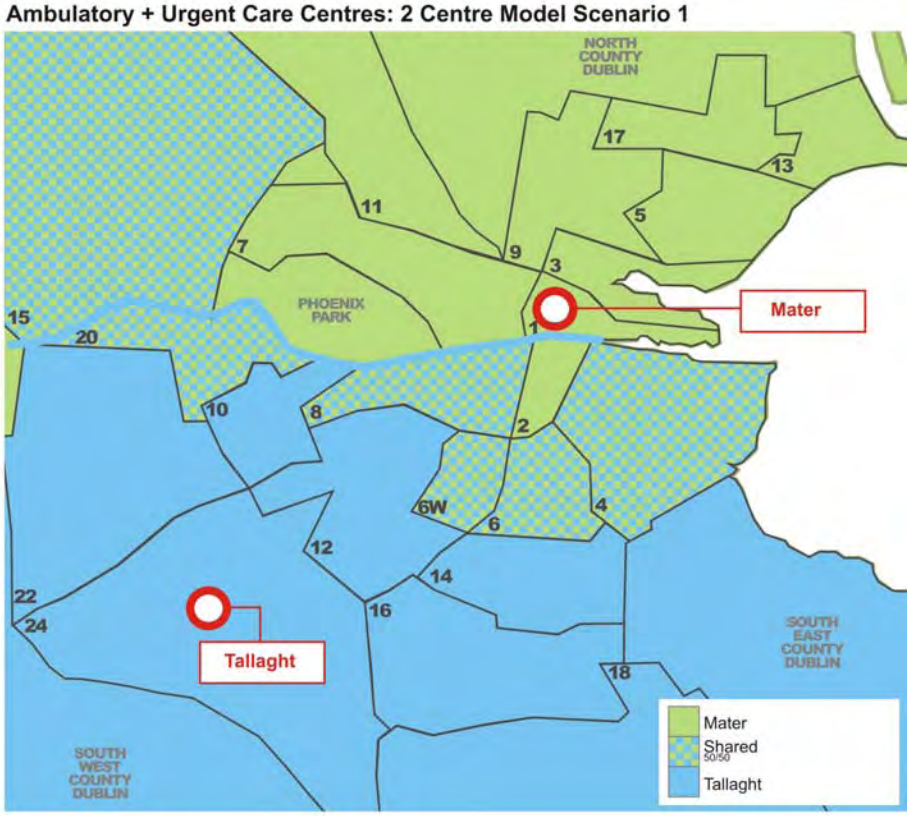


Figure 18

Ambulatory + Urgent Care Centres: 3 Centre Model Scenario 1

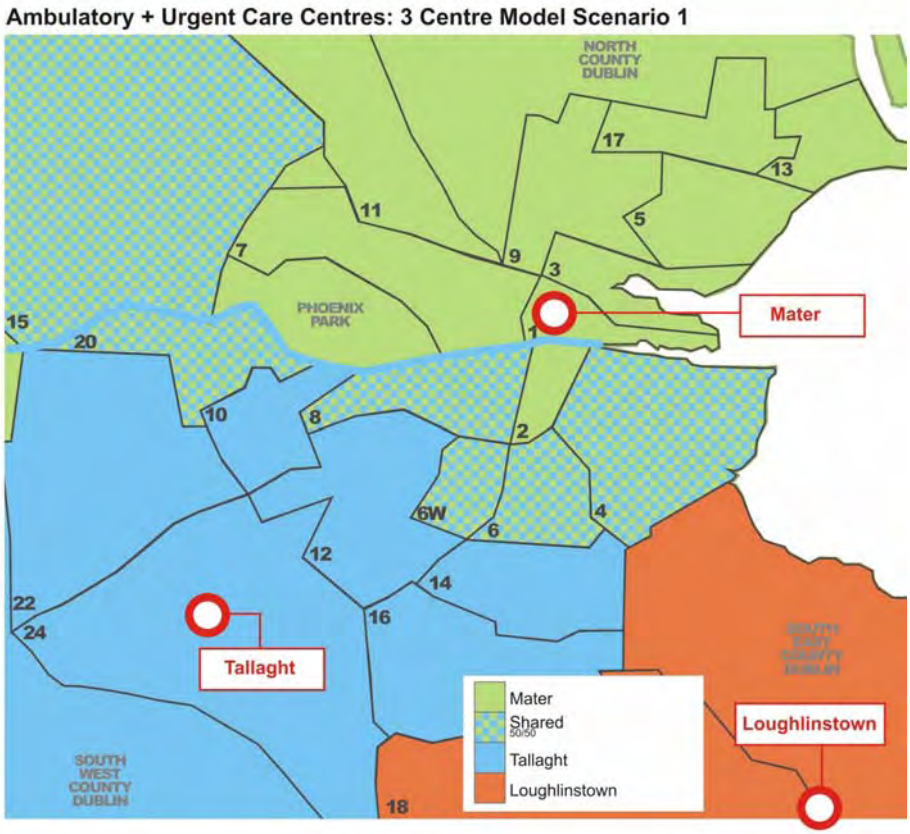


Figure 19

Ambulatory + Urgent Care Centres: 3 Centre Model Scenario 2

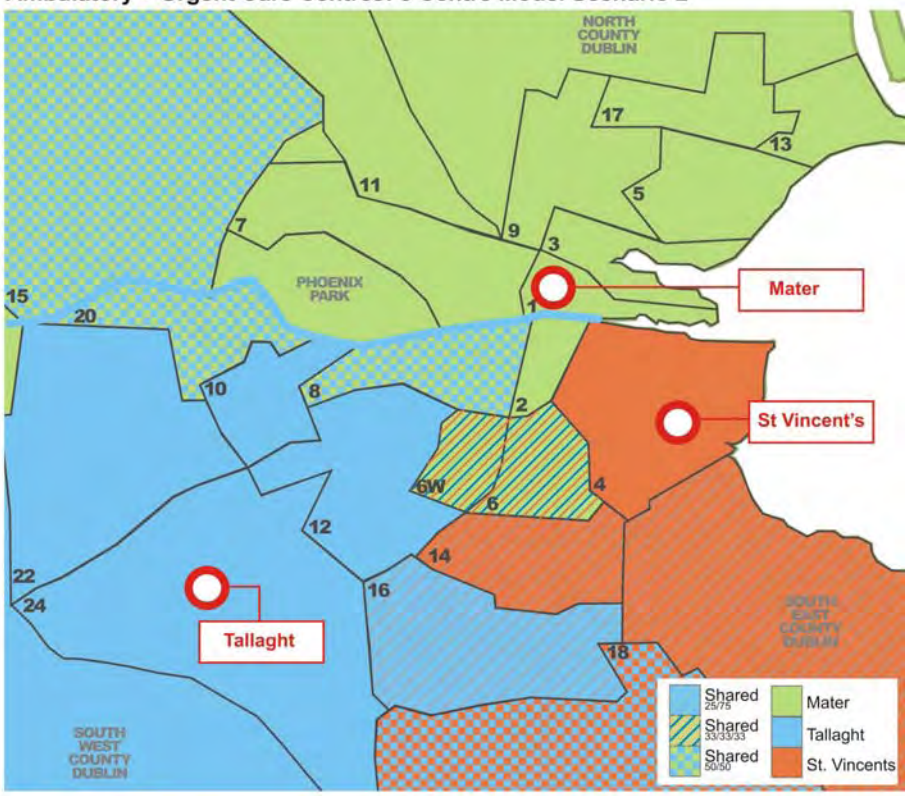


Figure 20

Ambulatory + Urgent Care Centres: 3 Centre Model Scenario 3

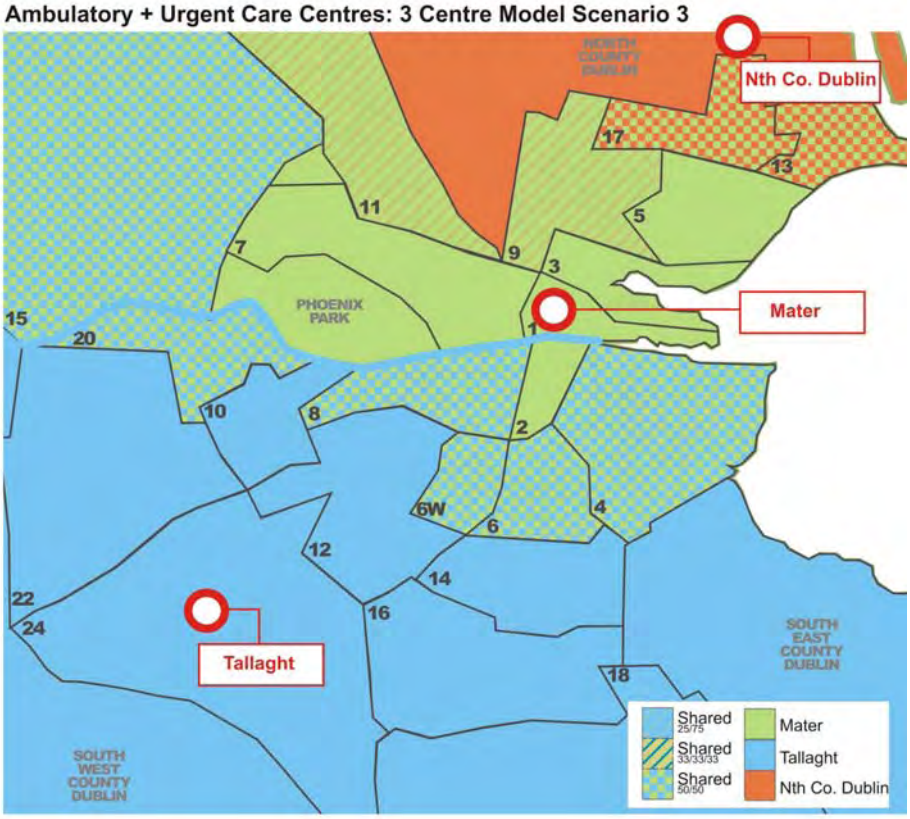


Figure 21

Ambulatory + Urgent Care Centres: 3 Centre Model Scenario 4

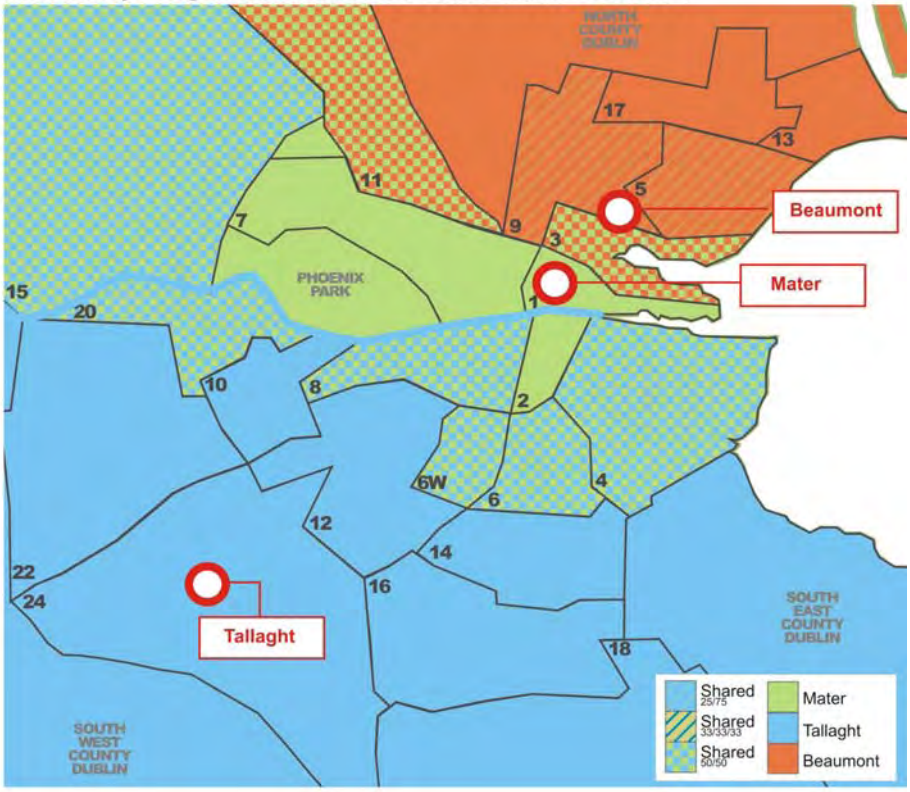


Figure 22

Ambulatory + Urgent Care Centres: 3 Centre Model Scenario 5

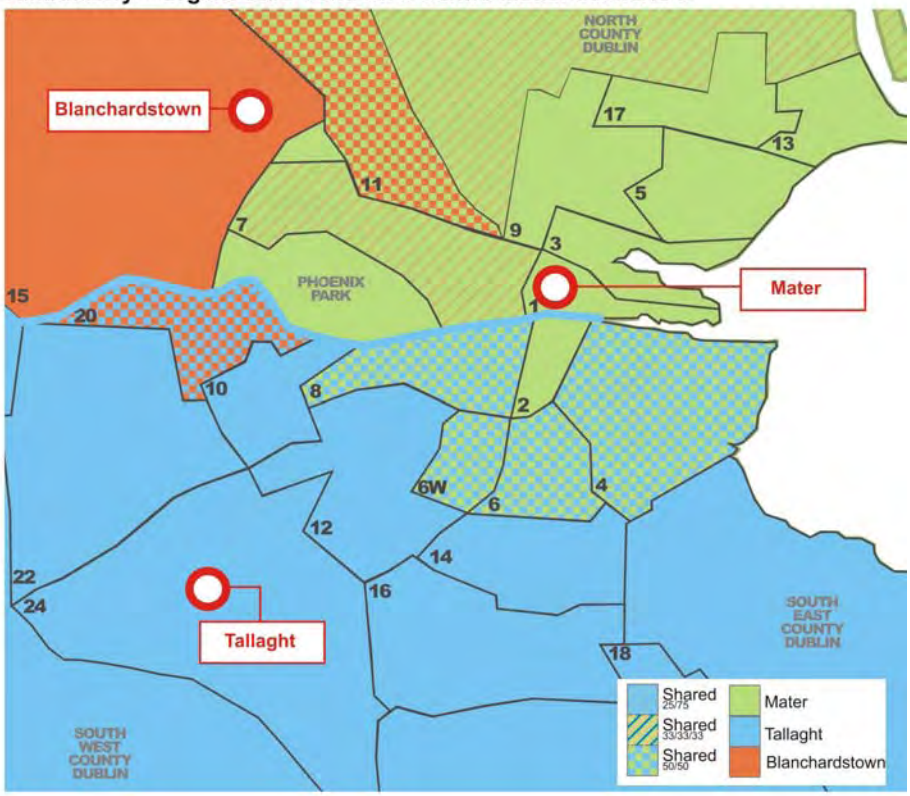


Figure 23

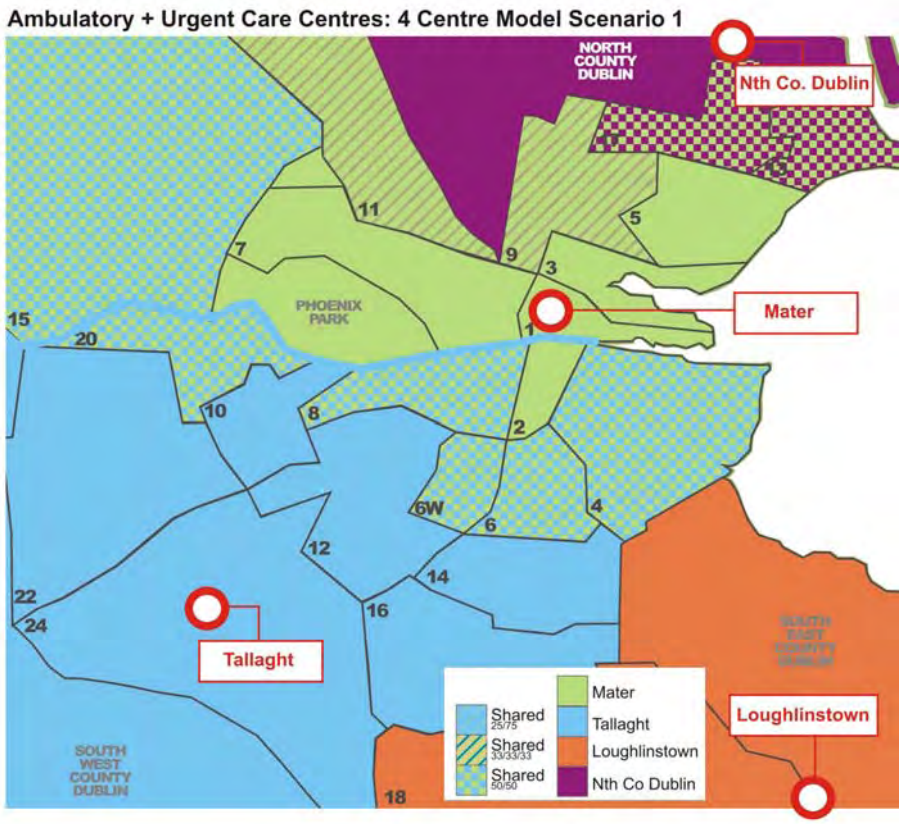
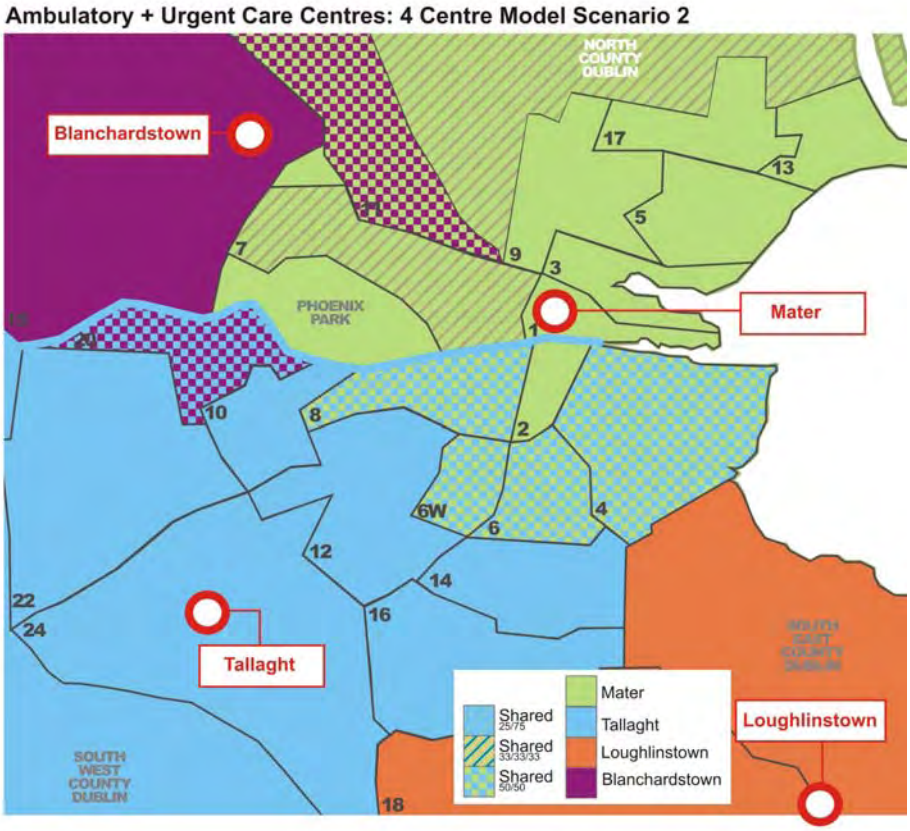


Figure 24



4.5 Step 4 : Evaluate Options

Each A/UCC scenario has been considered against the following criteria –

- Access and Travel Times
- Critical Mass
- Staffing Implications
- Available Infrastructure.

4.5.1 Access and Travel Times

The results of an analysis by the Department of Public Health and Primary Care, Trinity College of the travel time and access implications of each scenario are shown in Table 6. Background to the methodology used is provided in Appendix 2. The purpose of the travel time analysis, which considered both public and private transport, was to identify the relative accessibility of different site combinations.

From the analyses it is clear that a **two centre model** significantly improves access over a single site (ie assuming all activity at the centre) but that the addition of further sites has less impact. Scenarios with the same number of sites have similar overall average travel times although there are some differences.

Thus within the **three site service scenarios** Model 1 (Mater, Tallaght and Loughlinstown) has the lowest average travel time, the highest population percentage within 60 minutes and equal highest percentage within 30 minutes. Model 2 (Mater, Tallaght and St Vincents) is the least accessible against all three dimensions. Models 3, 4 and 5 have similar overall average travel times but with Model 5 showing a slight advantage in terms of percentage of population within 30 minutes. On the basis of these analyses St Vincent's was excluded from further consideration.

The two **four centre models** perform similarly against all three access measures and offered some improvement over the three site models.

In terms of **balance**, in the three site scenarios, St. Vincent's attracts low demand with the remaining sites having enlarged workloads. The inclusion of Beaumont impacts primarily on the Mater site leaving a large demand at Tallaght. There is greater balance in the four site scenarios, particularly Model 2 (Mater, Tallaght, Blanchardstown, Loughlinstown). This measure relates to disproportionate demand for services at one or more sites. On this basis Beaumont and St Vincent's were excluded from further consideration. A desirable attribute of any scenario would be that patients of different levels of deprivation are spread reasonably evenly across sites. As illustrated in Appendix 2 the Mater, Blanchardstown, Tallaght combinations achieve a reasonable distribution at the higher deprivation levels.

Table 6

		Average travel time	% population within 30 minutes	% population within 60 minutes	Existing Infrastructure
1 centre Model	**Mater**	**56.5**	**15.9%**	**69.7%**	✓
2 centre Model	***Mater***	**44.6**	**37.0%**	**78.2%**	✓
	Tallaght				✓
3 centre Model 1	***Mater***	**41.5**	**44.0%**	**80.8%**	✓
	Tallaght				✓
	Loughlinstown				?
3 centre Model 2	***Mater***	**43.9**	**38.4%**	**78.6%**	✓
	Tallaght				✓
	St Vincent's				✓
3 centre Model 3	***Mater***	**42.2**	**42.3%**	**80.0%**	✓
	Tallaght				✓
	Nth Co. Dublin				✖
3 centre Model 4	***Mater***	**42.0**	**43.2%**	**79.3%**	✓
	Tallaght				✓
	Beaumont				✓
3 centre Model 5	***Mater***	**42.5**	**44.1%**	**78.8%**	✓
	Tallaght				✓
	Blanchardstown				✓
4 centre Model 1	***Mater***	**39.1**	**49.20%**	**82.5%**	✓
	Tallaght				✓
	Loughlinstown				?
	Nth Co. Dublin				✖
4 centre Model 2	***Mater***	**39.3**	**51.1%**	**81.4%**	✓
	Tallaght				✓
	Loughlinstown				?
	Blanchardstown				✓

4.5.2 Available Infrastructure

In order to further differentiate between scenarios with similar access benefits, the availability of site infrastructure was considered. While it is envisaged that the A/UCCs would provide self contained paediatric services there are likely to be advantages in terms of general site infrastructure if located on an adult hospital site, including the potential to share some clinical and non-clinical support services. On this basis the models which include a North County Dublin option, with no hospital site available may be regarded as less favourable, particularly since the new regional hospital for the North East, the location of which is to be determined, would affect flows from this area. The patient flow consideration would apply to the Beaumont option.

We understand that infrastructure and service provision at St Colmcille's Hospital, Loughlinstown is less developed than other potential sites given the lack of any substantial investment there over the years. This would require further substantiation if this option is to be pursued. The models containing Loughlinstown were nevertheless retained for further evaluation because of their relative access advantages.

4.5.3 Critical Mass and Staffing Viability

The models shortlisted on the basis of access and infrastructure are illustrated in Table 7. These were further considered against the criteria of critical mass and staffing viability.

All sites, with the exception of Loughlinstown, would, on the basis of projected activity volume have a viable critical mass for urgent care, day and outpatient services. Thus the day case and outpatient activity projected for the Tallaght A/UCC is significantly greater than that which currently takes place at AMNCH. The projected day case activity for Blanchardstown is similar to that currently taking place at AMNCH and for outpatients approximately 80%. Thus while Loughlinstown's, projected outpatient activity would be sufficient to justify a consultant outreach service, day case viability is questionable because it represents less than the workload required to sustain a single theatre and would therefore be uneconomical and the projected urgent care attendances would be unlikely to sustain a consultant led service. For urgent care a consultant led service would require a minimum of 12,000 attendances per annum

according to the British Association of Emergency Medicine [14] , or as many as 16,000 based on recommendations in a 2007 report by the UK Intercollegiate Committee on Services for Children in Emergency Departments [15].

Table 7

	3 Centre Model 1			3 Centre Model 5			4 Centre Model 2			
	Mater	*Tallaght*	*Loughlinstown*	*Mater*	*Tallaght*	*Blanchardstown*	*Mater*	*Tallaght*	*Loughlinstown*	*Blanchardstown*
Average travel time (minutes)	**41.5**			**42.5**			**39.3**			
% population within 30 minutes	**44.0%**			**44.1%**			**51.1%**			
% population within 60 minutes	**80.8%**			**78.8%**			**81.4%**			
Urgent Care										
Critical mass	✓	✓	*n-led*	✓	✓	✓	✓	✓	*n-led*	✓
Staffing viability	✓	✓	*n-led*	✓	✓	✓	✓	✓	*n-led*	✓
Outpatients										
Critical mass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Staffing viability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Day Case										
Critical mass	✓	✓	✖	✓	✓	✓	✓	✓	✖	✓
Staffing viability	✓	✓	✖	✓	✓	✓	✓	✓	✖	✓

4.6 Step 5 : Preferred Option

4.6.1 Preferred Option

The analyses above demonstrate, on the basis of access, paediatric population density and projected activity a strong case for an A/UCC in **Tallaght** which should be developed as a prototype.

On the same grounds, a centre serving North West Dublin in **Blanchardstown** could also be justified but it is recommended that this should follow as a later phase subject to experience at Tallaght.

There is also, potentially, a case for consultant led outpatients in **Loughlinstown** and consideration may be given to a nurse led minor injuries service.

Further analysis of the likely workload, links with primary care and local infrastructure requirements should form part of the **next steps** towards implementation.

These should be **dedicated children's facilities** with an environment of the same quality and standards as the NPH Tertiary Centre and, operating within its staffing and management structure, provide high quality care for significant numbers of patients in local settings.

4.6.2. Activity Summary

Table 8 illustrates the level of activity projected to 2021 for this model.

Table 8

	NPH Tertiary Centre	Tallaght	Blanchardstown	Loughlinstown	TOTAL
Day Cases	16,527	8,358	3,815		**28,700**
Outpatients	117,124	41,250	24,940	13,386	**196,700**
A&E attendances	44,628	34,039	20,584	11,049	**110,300**

Note : of the total outpatient attendances at the Tertiary Centre a proportion of this will be outreach outside Greater Dublin

4.6.3 Indicative Models and Sizing

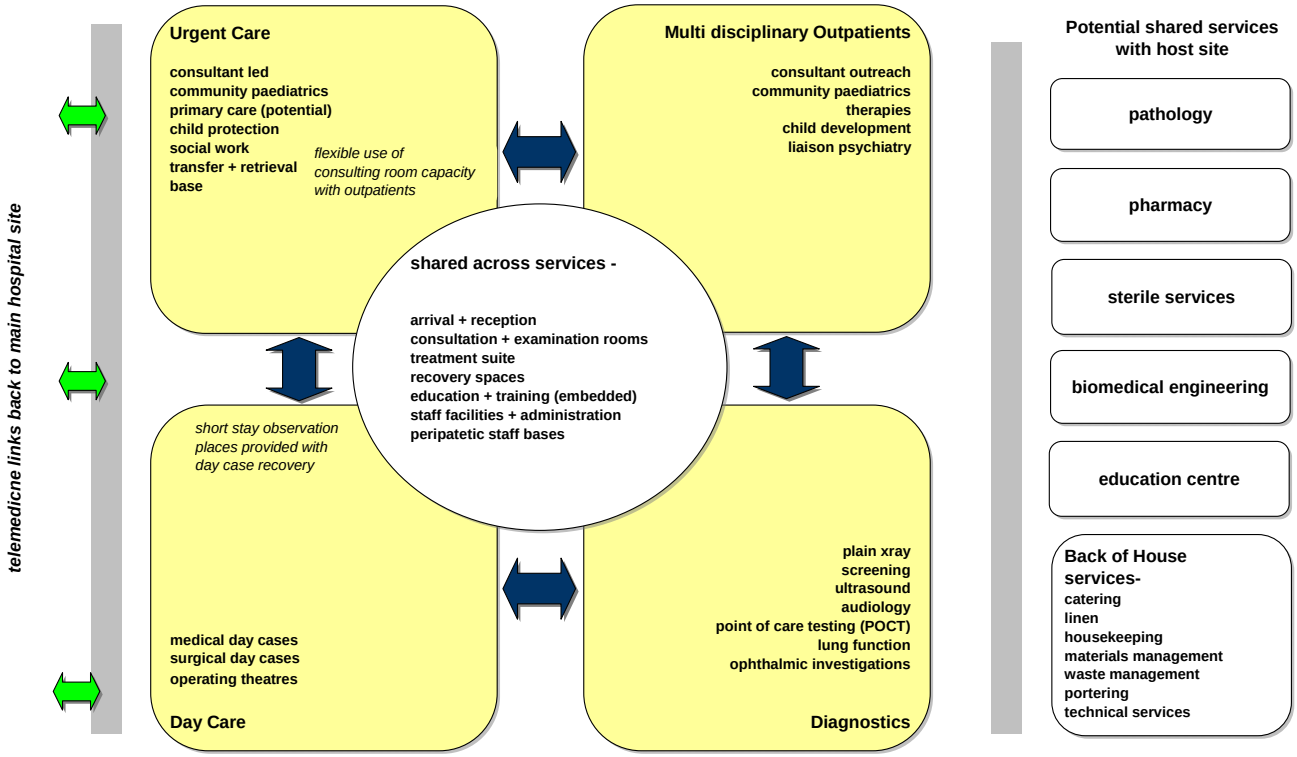
Two possible models for Ambulatory and Urgent Care Centres are illustrated in Figures 25 and 27. The centres at Tallaght and, eventually, at Blanchardstown would provide a range of Urgent Care, multi-disciplinary outpatient services, day case and diagnostics.

An indicative range of services is illustrated in the diagram in Figure 25 which is based on our International experience and local stakeholder views. The model would be adapted locally to reflect local population needs, and inputs by specialties. Examples of clinical services that could be provided are listed in Figure 26. It should

be noted that this is illustrative and that a more extensive range is feasible as demonstrated by the CHOP model.

Good IT links back to the main NPH Tertiary Centre will be essential.

Figure 25



It is envisaged that these centres will play an important part in Education and Research. Therefore location on a site with an established Education Centre is important. In sizing these units we have also assumed some Education and Training facilities embedded in the A/UCC. While these centres will serve the needs of their local populations, they could also accommodate services for the whole NPH Tertiary Centre network which do not need to be provided on the main site, for example team bases and health promotion. Services shared with the host site could include –

- Pathology
- Pharmacy
- Sterile Services
- Biomedical Engineering, and
- Facilities Management services.

Figure 26

Examples of conditions treated as **Urgent Care:**

- Allergic reactions
- Asthma
- Broken bones
- Burns (minor)
- Cuts (minor)
- Coughing
- Dehydration
- Diarrhoea
- Ear aches and infections
- Fever
- Infected insect bites
- Rashes and bumps
- Small animal bites
- Sprains
- Sore throats
- Stomach aches
- Vomiting

Examples of **Outpatient** services**:**

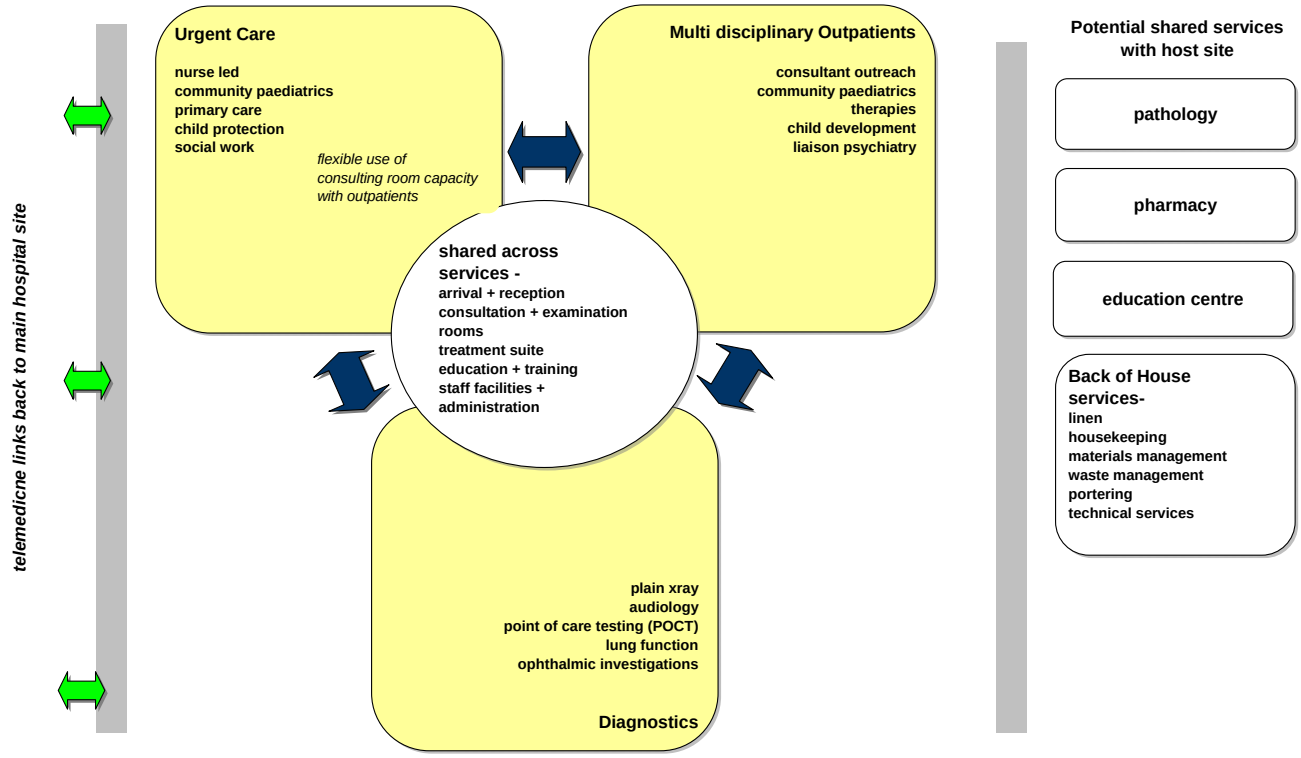
- Consultant clinics
- Nurse led clinics
- Child Development
- Community paediatrics
- Audiology
- Ophthalmology (Eyes)
- Xray
- Blood tests
- Physiotherapy
- Speech and Language therapy
- Psychology and psychiatry

Examples of **Day Case** procedures:

- Fracture reduction
- Examinations under anaesthesia
- Suture removal
- Biopsy
- Circumcision
- Hernia repair
- Removal of skin lesions
- Ingrown toenail

Model 2 described in Figure 27, is smaller than Model 1 and excludes day cases. The proposal is for nurse-led Urgent Care and a more limited range of diagnostic services. This is the Model which may be appropriate for Loughlinstown.

Figure 27



4.6.4 Functional Content and Area Requirements

Table 9 sets out the functional content and indicative size of the proposed A/UCCs in 2021.

In total, the A/UCCs by 2021 would together total approximately 12,400m^2 of accommodation. It is important to recognise that if this is not provided in AUCCs an increase in capacity at the NPH Tertiary Centre site would be required by 2021.

In terms of design and quality, it will be important that centres are of the same quality and branding as the NPH Tertiary Centre.

Currently, the Children's services at AMNCH are fragmented across a number of locations and are accessed via the adult hospital main circulation routes. The likelihood is therefore, that a new build facility is the optimum approach, but the feasibility of reconfiguration of the existing facilities could be tested.

Table 9

	1. Tallaght Functional Content + Sizing 2021	2. Blanchardstown Functional Content + Sizing 2021	3. Loughlinstown Functional Content + Sizing 2021
Urgent Care			
attendances	34,000	20,600	11,000
ɛssment and treatment rooms	12	8	5
observation places	7	4	2
Multidisciplinary Clinics			
Generic Consulting rooms	12	7	4
Specialist rooms	16	11	6
Child development	✓	✓	✓
Therapies	✓	✓	✓
Liaison Psychiatry	✓	✓	
Health Promotion	✓	✓	
Child Protection	✓	✓	
Diagnostics			
plain xray and screening	2	1	1
ultrasound	1	1	
Point of Care testing	✓	✓	
Audiology	✓	✓	✓
Ophthalmic investigations	✓	✓	✓
Respiratory Investigations	✓	✓	
Cardiology Investigations	✓	✓	
Day cases			
beds / places	20	10	
theatres + procedure rooms	3	2	
Area (GIA sqm)	**6,200**	**4,700**	**1,530**

5 Implementation and Next Steps

On the basis of access, paediatric population density and projected activity there is a case for an A/UCC in **Tallaght.** On the same grounds, a centre serving North West Dublin in **Blanchardstown** would also be justified. There is also a case for consultant led outpatients in **Loughlinstown** and consideration may be given to a nurse led minor injuries service. However, notwithstanding international experience of A/UCCs operating successfully within paediatric networks, strong reservations have been expressed regarding the introduction of an unfamiliar model into the Irish context, particularly at a time of radical change within the health care system. These views were strongly represented at the stakeholder workshops. Accordingly it is recommended that the key steps in developing the A/UCCs should include establishment of a cross-hospital planning forum with responsibility for leading –

- Development of care pathways and protocols
- Activity modelling, to identify in detail which specialties and procedures will be undertaken in A/UCCs
- Detailed scheduling of functional content and area requirements
- Workforce planning and development of staffing models
- Integration of information technology with links ultimately to the NPH Tertiary Centre and in the initial phase to the existing children's hospitals
- Liaison with primary and community services and other agencies to build local interfaces
- Liaison with academic partners regarding education and training requirements
- Cost benefit analysis including capital and revenue consideration.

Subject to the outcome of this work it is recommended that an A/UCC should be developed in **Tallaght** as a prototype..

A/UCCs should be **dedicated children's facilities** with an environment of the same quality and standards as the NPH Tertiary Centre and, operating within its staffing and management structure, provide high quality care for significant numbers of patients in local settings.

Transfer and retrieval services should have been established and be fully functioning in advance of the A/UCCs.

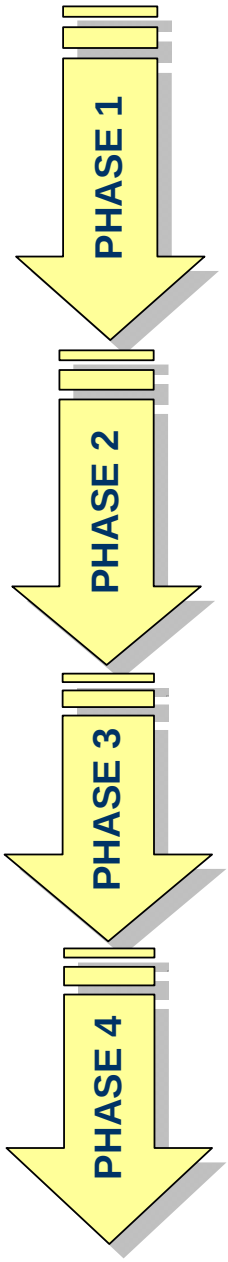
Early implementation of **Electronic Patient Records** and **Telemedicine** including digital transfer of images will be essential.

The development of further A/UCCs in greater Dublin should be considered when the Tallaght model has been evaluated, when workforce viability has been established and demand and capacity requirements confirmed.

It should be noted that capacity and area analyses in this report and the Framework Brief assume, ultimately, development of full A/UCCs at Tallaght and Blanchardstown and the modified model in Loughlinstown. Subject to the evaluation of the Tallaght prototype it may be necessary to augment provision at the NPH Tertiary Centre if less than projected outreach occurs.

Table 10

Implementation of Ambulatory and Urgent Care Centres



Develop the Concept

- Develop protocols and care pathways
- Specify specialties and procedures to be included
- Undertake workforce planning and develop staffing models
- Develop detailed functional content and space requirements
- Explore potential for shared services on the host site
- Confirm governance arrangements

Implement NPH A/UCC at Tallaght

- Agree physical model and location on site
- Determine timescale for phasing out inpatient services
- Confirm service volumes and specialty mix
- Pilot protocols and care pathways
- Evaluate model

Implement NPH A/UCC at Blanchardstown

- Timed to meet capacity requirements
- Service volumes and specialty mix determined from evidence and experience at Tallaght

Loughlinstown Model

- Timed to meet capacity requirements
- Service volumes and specialty mix determined from evidence and experience at Tallaght

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Glossary

A&E	-	Accident and Emergency Department
A/UCC	-	Ambulatory and Urgent Care Centre
AMNCH	-	Adelaide and Meath National Children's Hospital
CHOP	-	Children's Hospital of Philadelphia
CUH	-	Children's University Hospital, Temple Street
DATHs	-	Dublin Area Teaching Hospitals
DC	-	Day Case
DGH	-	District General Hospital
DOH&C	-	Department of Health & Children
DRG	-	Diagnostic Related Group
ED	-	Emergency Department
GDA	-	Gross Departmental Area
GIA	-	Gross Internal Area
HSE	-	Health Service Executive
IP	-	Inpatient
IPDC	-	Inpatients and Day Cases
IT	-	Information Technology
NCH	-	National Children's Hospital
NPH	-	National Paediatric Hospital
OLCHC	-	Our Lady's Hospital for Sick Children, Crumlin
OOH	-	Out of Hours
PUCC	-	Primary Urgent Care Centre
PUCN	-	Paediatric Urgent Care Network
SHO	-	Senior House Officer
SPR	-	Specialist Registrar
T&A	-	Tonsillectomy and adenoidectomy

Appendix 1

International Examples of Ambulatory and Urgent Care Centres

Contents

Ambulatory and Urgent Care Centres

Introduction

We have identified a number of models for ambulatory and urgent care linked to tertiary paediatric centres. The descriptions below are based on the information provided from the centres and are presented to illustrate the range of approaches. The applicability of any of these to Ireland will require careful consideration in terms of its local context. Key features include–

- Often the same brand as the tertiary centre
- Sometimes operating in association with local providers
- Ability for swift transfer if inpatient services and/or more specialist intervention is required
- May be free-standing units, part of health centres or designated sections in the A&E departments of adult hospitals.
- Partner hospitals can provide economies of scale in sharing of support services
- Usually sited in proximity to paediatric population
- Ambulatory Care consists of specialty and sub-Specialty outpatient and outreach services provided by prior appointment by Paediatricians from secondary and tertiary children's hospitals or specialists with an interest in paediatrics
- Ambulatory Care is typically provided during office hours with the Urgent Care element focusing on primary-care type needs out of normal GP hours sometimes, but not always, in the same unit
- The urgent care element is usually fast-track, walk-in, accepting patients with or without appointment, consisting of the assessment and treatment of minor paediatric illnesses and injuries that are non-life threatening but require same-day medical attention –
  - Cuts / infected insect bites / small animal bites / minor burns / suspected sprains or broken bones
  - Stomach aches / vomiting or diarrhoea
  - Ear aches / ear infections / fever
  - Sore throats / coughing / wheezing
  - Allergic reactions / skin rashes
- Urgent Care Centres may provide an extended range of investigations and treatments - x-rays, bloods, stitching, pharmacy, and rehabilitation services that would not typically be available at a GP practice
- Services are typically Paediatrician-led (unless there are dedicated nurse-led clinics or for triage) and staffed by paediatric qualified nurses
- Physician's Assistants are also used in North America
- Doctors are usually A&E experienced Paediatricians or experienced family doctors (with a special interest in Paediatrics)

- In some cases on-site clinical support services are provided by paediatric trained/experienced practitioners or in shared services they are closely supervised by paediatric staff
- Ambulatory Care is often supported by other clinical disciplines from the same hospitals – occasionally utilising local clinical support services to further skills transfer and ensure continuity of care e.g. post discharge
- Emerging information and telecommunications technology to develop processes such as Telehealth, Telepsychiatry and Teleradiology are further improving access to paediatric healthcare services.

The Hospital for Sick Children (Sick Kids), Toronto, Ontario

Introduction

Sick Kids is the largest provider of paediatric health services in Canada and is supported by a network of urgent care services.

Some centres provide whole day access and others are open for urgent care in the afternoon through to the evening.

Urgent Care

Urgent care is provided via a network of 10 walk-in centres located across the state of Ontario.

Some are dedicated paediatric clinics, some are co-located on premises of community health centres, others are part of out-of-hours medical practices. All are walk in except one which is by appointment only with same day appointments being available.

Where the clinic is a dedicated paediatric centre – opening times tend to be 9.00am with most closing at either 8.00pm or 9.00pm weekdays and 9.00am to anytime up to 6.00pm weekends and holidays. Where the centre is sharing space with community health services, opening times are 5.00pm -10.00pm weekdays and weekends vary on arrangements from earliest opening time at 10.00am and latest closing time 10.00pm

Most centres provide a phlebotomy service conduct standard blood and urine tests, some do suturing and wound management, x-rays, ECGs, casting simple fractures and oxygen therapy.

Ambulatory Care

General and sub-specialty outpatient and assessment services are provided centrally in a medical day care unit at Sick Kids. Ambulatory day surgery procedures are also provided at Sick Kids.

There is overnight accommodation provision with rooms for patients, parents, and the patient's siblings where appropriate and available.

Some local hotels offer discounts to parents / attendees of the hospital – the details of which are provided by the Sick Kids' Discharge Planning department.

Home Care

Home care services for children with chronic conditions, those recovering from serious illness or undergoing home-based palliative care although arranged by the hospital are provided by local community health and social care services.

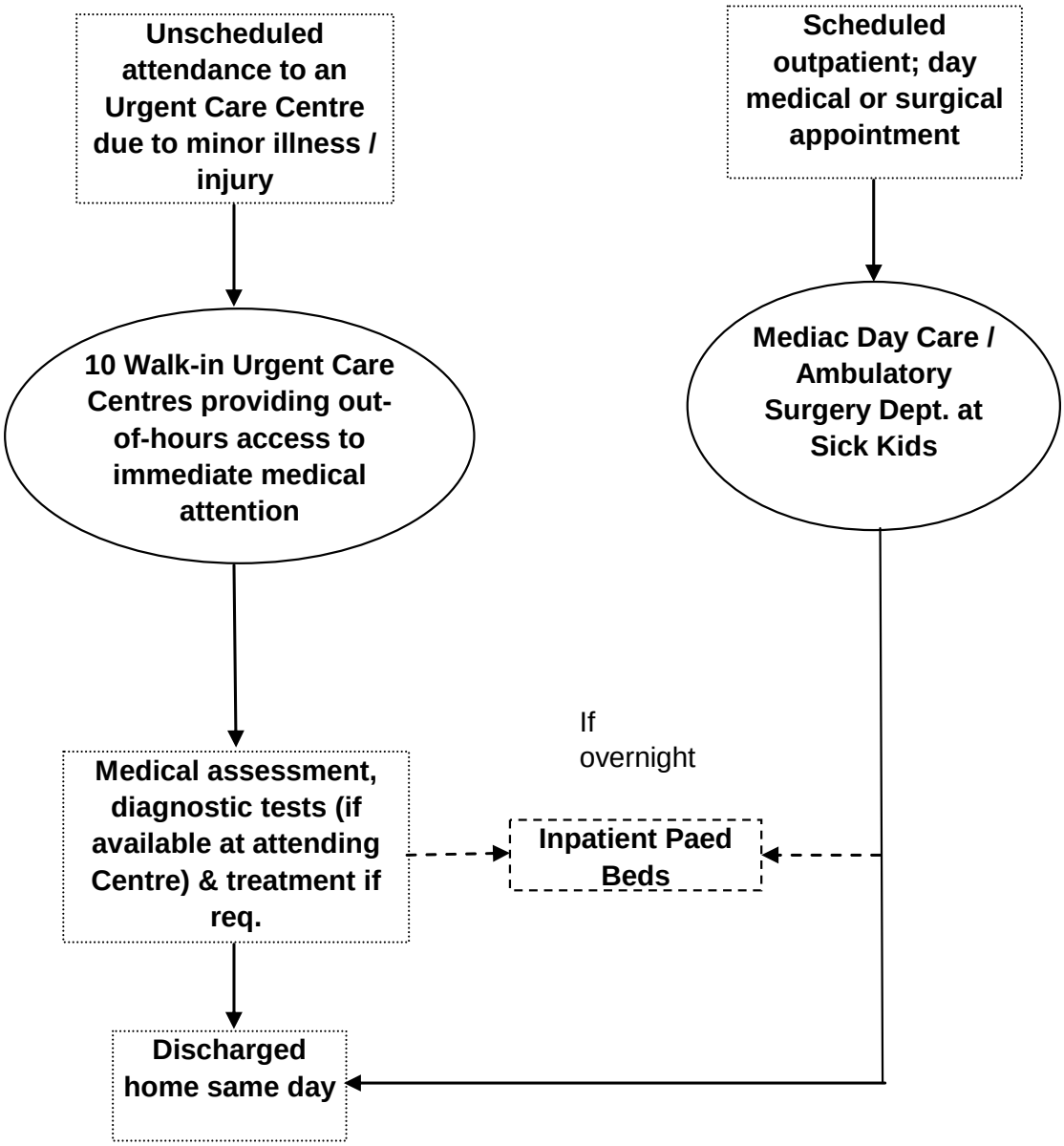
Staffing

Urgent care centres are staffed by community paediatricians, paediatric nurses and relevant technicians for clinical support services where provided.

Tertiary / Secondary Relationship

Sick Kids is the provider for secondary services in the Toronto region and provides tertiary paediatric services for the state of Ontario and beyond.

The Hospital for Sick Children (Sick Kids), Toronto, Ontario



The Children's Hospital Paediatric Urgent Care Network – Denver, Colorado

Introduction

Four different models used and all 4 sites are integrated with an out-of-hours telephone and triage advice service (similar to NHS Direct but dedicated to paediatrics) -

- 98% local practice utilisation
- Calls from parents managed by specially trained nurses using triage and advice protocols
- 75-80% of parents receive recommendation for home management or "temporising advice" until the next available clinic visit
- 20-25% of calls require urgent care recommendation and parents are instructed to attend a Paediatric Urgent Care Centre or the Children's Hospital A&E and the Call Centre faxes the referral site with details including reason for referral
- Medical staff are recruited, trained, managed and salaried by the Children's Hospital
- All doctors are certified in Paediatrics, the Children's Hospital A&E doctors are trained in paediatric emergency medicine
- All other staff and service overheads at Urgent Care Centres are provided by the host hospital partner.

Model 1 – Paediatric Emergency Medicine located in a host hospital A&E

- Hospital located in an urban area with a mainly working class population
- Staffed by paediatric emergency medicine specialists from the Children's Hospital: 1 physician and 2 nurses
- Own logo and signage to distinguish the unit
- Operates 17.00-01.00 weeknights, 12.00-01.00 Saturdays and 09.00-01.00 Sundays
- Triaged at the main A&E triage station
- During operating hours all paediatric patients are referred to the unit by emergency teams
- Diagnostic and services are shared with the host hospital
- 8 beds and 1 resuscitation bay are allotted for paediatrics
- Serves a clinical rotation for student GPs, paediatricians and nurses

Model 2 – General Paediatricians located in a host hospital A&E

- Hospital located in a suburban, mainly middle class area
- Staffed by 1-2 general paediatricians, 2 registered nurses and 1 technician
- Operates 17.00-01.00 weeknights, 12.00-01.00 Saturdays and 09.00-01.00 Sundays
- 9 beds including 2 resuscitation bays

- Local agreement with Emergency Physicians prevents unit from dealing with major or minor trauma
- Labelled as “Paediatric After Hours” - local agreement precludes own TCH signage
- Serves as a rotation for medical students

Model 3 – General Paediatricians in a Stand-alone Urgent Care Centre

- Strategically located with easy access, clearly visible and identifiable by own logo and signage as being part of the Children’s Hospital
- Unit is shared with adult services provided by another hospital
- Weekdays 08.00-17.00 the space is used to provide rotating paediatric sub-specialty clinics from the Children’s Hospital
- Out-of-hours - 17.00-01.00 weeknights and 09.00-01.00 weekends, the clinic is staffed by general paediatricians from the Children’s Hospital providing paediatric urgent care
- The Centre does not have A&E status -
  - Ambulances do not transfer patients to the unit
  - Limited medical and trauma acuity
  - Children requiring hospitalisation or overnight observation are transferred to the Children’s Hospital
- Adult urgent care service is provided 09.00-21.00 daily and paediatric urgent care attendances during the day are cared for by adult physicians
- Consists of 7 examination rooms, a minor trauma room and, a paediatric resuscitation bay
- All rooms provide centralised supplemental oxygen
- Plain Film X-ray is on-site and shared with adult services
- Lab tests e.g. blood counts, routine chemistry, urinalysis pregnancy tests and, streptococcal screens are performed on-site
- Cultures, spinal fluid studies and, other specialised tests are sent to the Children’s Hospital by courier

Model 4 – General Paediatricians in an Urgent Care Centre on a host Hospital Campus

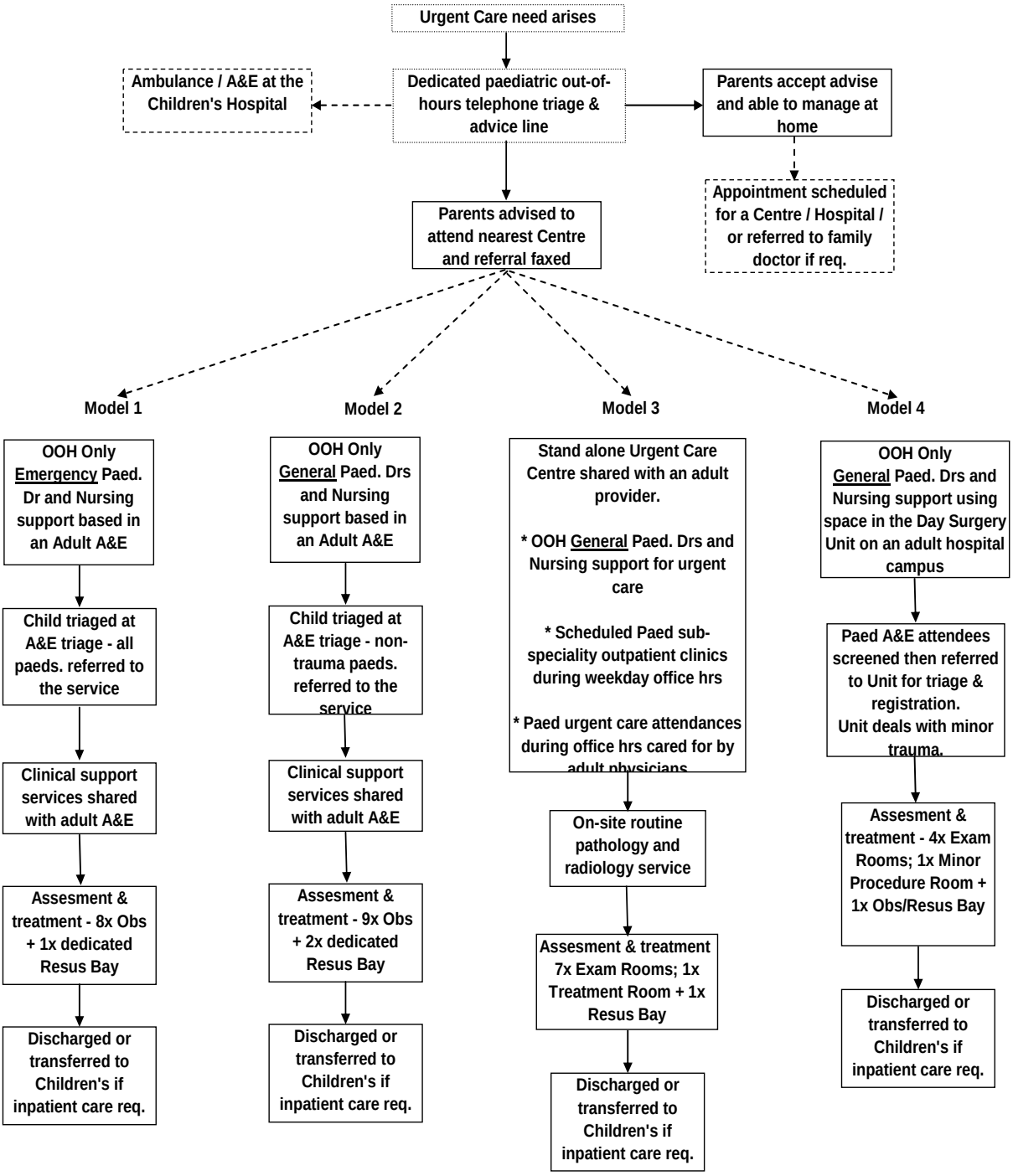
- Shared space with a day surgery unit located near the host hospital’s A&E
- Own entrance and prominent signage
- Triage and registration on-site
- Children attending A&E are screened and referred to the Urgent Care Centre – all major trauma is dealt with by A&E
- Minor trauma, fractures, lacerations are dealt with by the Urgent Care Centre
- Operates 17.00-01.00 weeknights, 12.00-01.00 Saturdays and 09.00-01.00 Sundays
- Consists of a waiting area, 4 examination rooms, a minor procedure room with an operating table and an observation / resuscitation area

- Staffing: 1 or 2 paediatricians, 2 to 3 nurses, emergency medical technician, a unit clerk and a registration clerk

Consistent features

- Medical staff are employed exclusively by the Children's Hospital
- Telephone contact with on-call specialists at the Children's Hospital routine in the case of complicated or "worrisome" patients
- All Centres immediately forward details of attendance, assessment and treatment to the child's primary clinician.

The Children's Hospital Paediatric Urgent Care Network, Denver, Colorado



The Children's Hospital of Philadelphia (CHOP), Pennsylvania

Introduction

CHOP professes to be the first dedicated children's hospital in the US and has been ranked the best in the country by Child Magazine for the last four consecutive years.

CHOP has an extensive paediatric healthcare network for urgent and ambulatory care with services ranging from vaccinations, medical treatment and surgery.

The network consists of the main hospital centres and a range of dedicated paediatric services in association or partnership with other providers in the states of Pennsylvania, New Jersey and Delaware.

Operating times for urgent care vary from centre to centre, however, most, consistently provide a service that extends to late weekday and part weekend provision.

Urgent Care

Urgent care is provided via four CHOP Primary Care Centres (in the Philadelphia region) and 28 Kids First Centres (across Pennsylvania, New Jersey and Delaware) catering for a range of medical conditions.

Day Surgery

Day surgery is provided through four dedicated Ambulatory Surgery Centres - one in the main hospital and three others located in suburban areas.

A growing number of procedures are carried out by CHOP surgeons aided by paediatric anaesthetists.

Outpatient and Outreach

Outpatient and outreach services are provided through nine dedicated Specialty Care Centres across Pennsylvania and New Jersey.

These centres cater for multi-professional diagnostic assessments, treatment, follow-up and rehabilitation services.

Home Care

A multidisciplinary team of medical, nursing, social care and allied health professionals provide coordinated home-based care to thousands of children recovering with chronic conditions or recovering from serious illness. These services are provided by CHOP and are concentrated in the Philadelphia area.

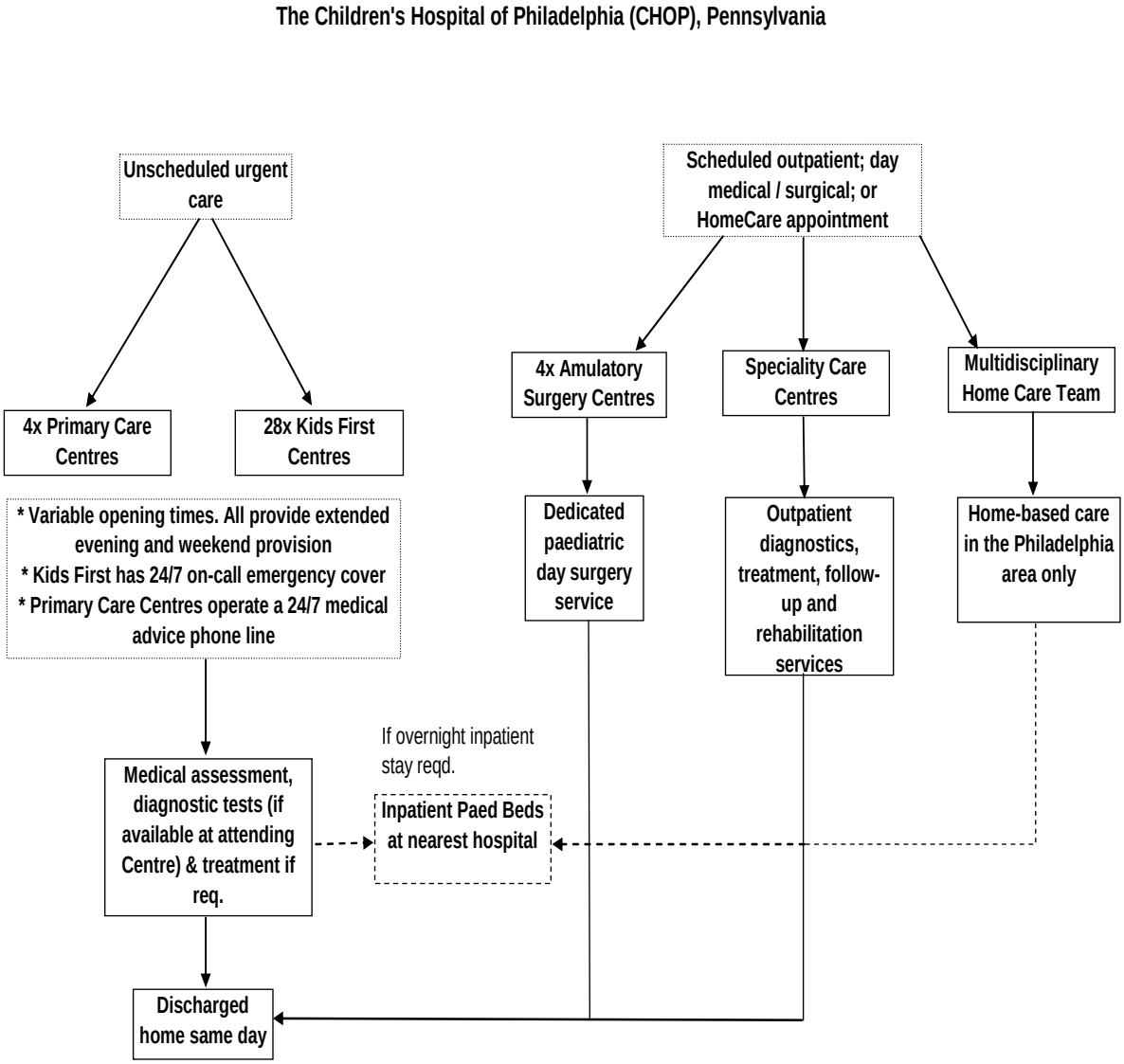
Staffing

CHOP managed or directly supported services such as the Primary Care, Specialty Care and Ambulatory Surgery Centres are staffed by CHOP specialists ranging from paediatricians, surgeons, paediatric anaesthetists, nurses, technical and social support workers.

The Kids First Centres have their own staff but their doctors have associated staff status with local hospitals and CHOP.

Tertiary / Secondary Relationship

Through its wide paediatric network of centres CHOP is a provider of significant primary, secondary and tertiary children's healthcare services across Pennsylvania New Jersey and Delaware.



Cincinnati Children's Medical Centre

Introduction

The Urgent Care element here is designed to fill the immediate out-of-hours service need that arises once GP / family doctor services have closed.

Urgent Care and Outpatient Services

Anderson, Fairfield and Mason are effectively both Ambulatory and Urgent Care Centres, dealing mostly with minor illnesses and injuries that need immediate attention. Seven other centres provide varying degrees of services associated with ambulatory care such as specialty outpatient clinics and diagnostics – as illustrated in the table below.

Anderson, Fairfield and Mason provide the scheduled outpatient clinics during office hours reverting to the unscheduled urgent care element during out-of-office hours: 6pm-11pm weekdays, 12pm-7pm Saturday, 11am-7pm Sunday and closed during public holidays.

Locations	Specialty Services	Radiology	Pathology	Urgent Care
Anderson	x	x	x	x
Drake	x			
Eastgate	x	x	x	
Fairfield	x	x	x	x
Harrison	x	x	x	
Kenwood		MRI Only		
Kentucky	x	x	x	
Mason	x	x	x	x
Oak	x			
West Chester	x		x	

Day Surgery

Day surgery appears to be routinely provided in the main Children's Medical campus. However, Urgent Care Centres will treat minor broken bones, cuts and burns, where possible. Patients with significant injuries would be referred to the nearest A&E department.

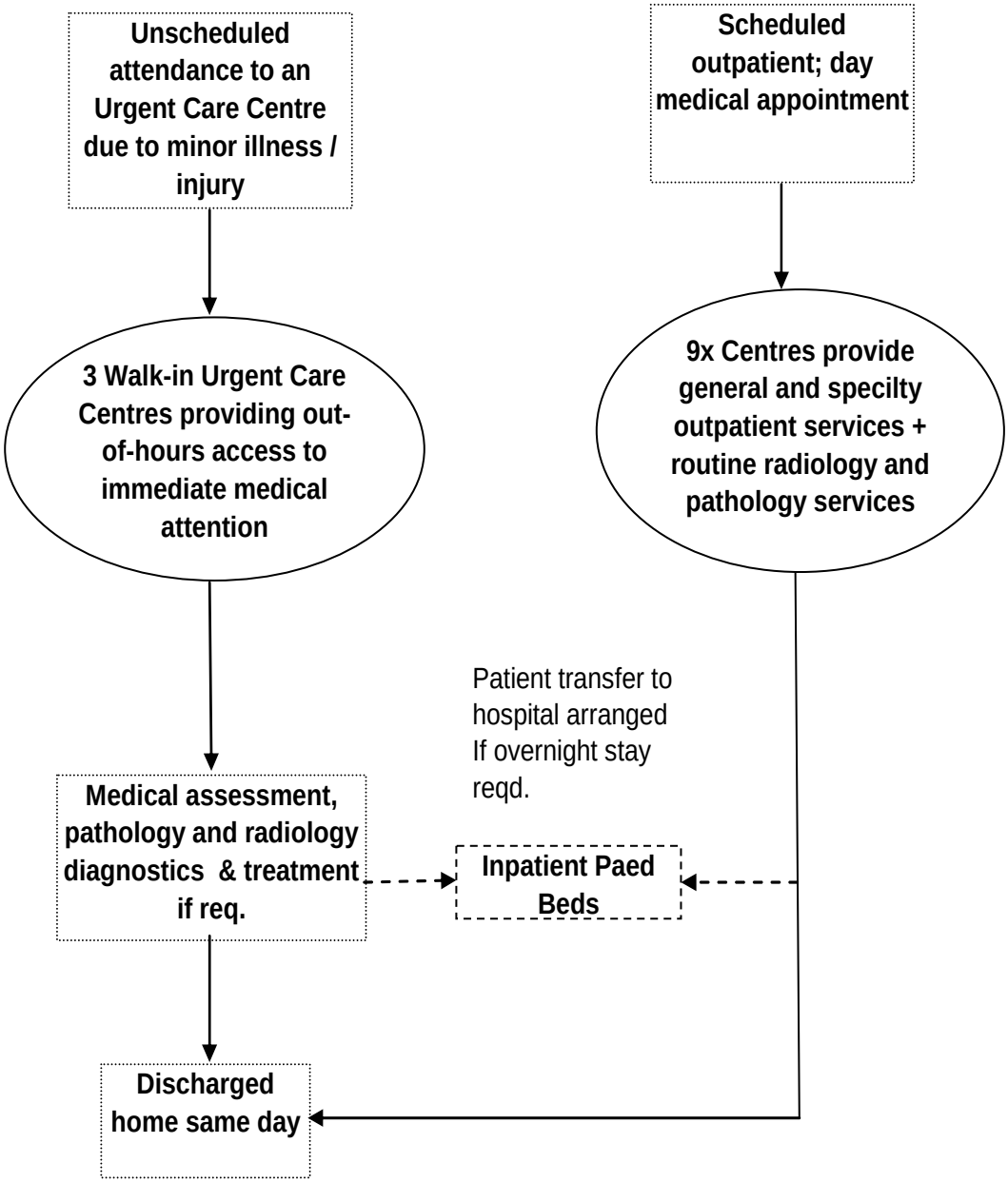
Staffing

Paediatrically trained doctors and nurses associated with the Children's Medical Centre.

Secondary / Tertiary Relationship

Where secondary or tertiary specialist care is required, the transfer of the patient to the main hospital is facilitated by the Urgent Care Centre.

Cincinnati Children's Hospital Medical Centre



Westmead Children's Hospital, Westmead (nr Sydney), Australia

Urgent Care

- Provided 24/7 via the Emergency Department – supervised by a specialist in emergency paediatric medicine
- All types of illness, injury and trauma from self and GP referral to ambulance or helicopter transfer
- Kids Helpline free, dedicated, confidential, anonymous, 24/7 telephone and online counselling service for children from 5-18.

Day Surgery

- A range of minor surgical procedures in a joint admission stream with inpatient day of surgery arrivals but with a separate stream for post-operative recovery and discharge
- Day Surgery staff make next day follow-up contact with the child's parent to review progress and to provide reassurance.

Outpatient and "Bandaged Bear Clinics"

- Substantial range of general paediatric, secondary and tertiary sub-specialist outpatient services provided at and from Westmead (outreach).

Outreach – "A Hospital without Walls"

- "Ensuring that sick children living in the country are not disadvantaged by distance is a priority"
- Specialists travel to regional clinics for consultations to treat children locally -
    - Children may be recipients of regular treatment, former patients of Westmead or new referrals
- Frequency and duration vary depending upon demand, ranging from 4 days a year to weekly
- At present 26 centres host outreach clinics from 18 hospital departments ranging from general to tertiary sub-specialties -
    - Adolescent Medicine, Cardiology, Child Protection Unit, Clinical Genetics, Endocrinology, Ear Nose and Throat, Gastroenterology, Genetic Metabolic Service, Neurogenetics, Neurology, Nephrology, Ophthalmology, Paediatrics, Paediatric Surgery, Psychological Medicine, Rehabilitation, Respiratory Medicine, Spina Bifida
    - Some departments are now focusing on local skills-upgrading rather than just on treating patients
    - The development of Telehealth, Telepsychiatry, and Teleradiology is further facilitating the attempt to develop a 'shared care' approach with other local health professionals (network extends to 160 healthcare facilities across New South Wales)
- Visiting specialists will refer children to the hospital if further assessments would be better facilitated at Westmead.

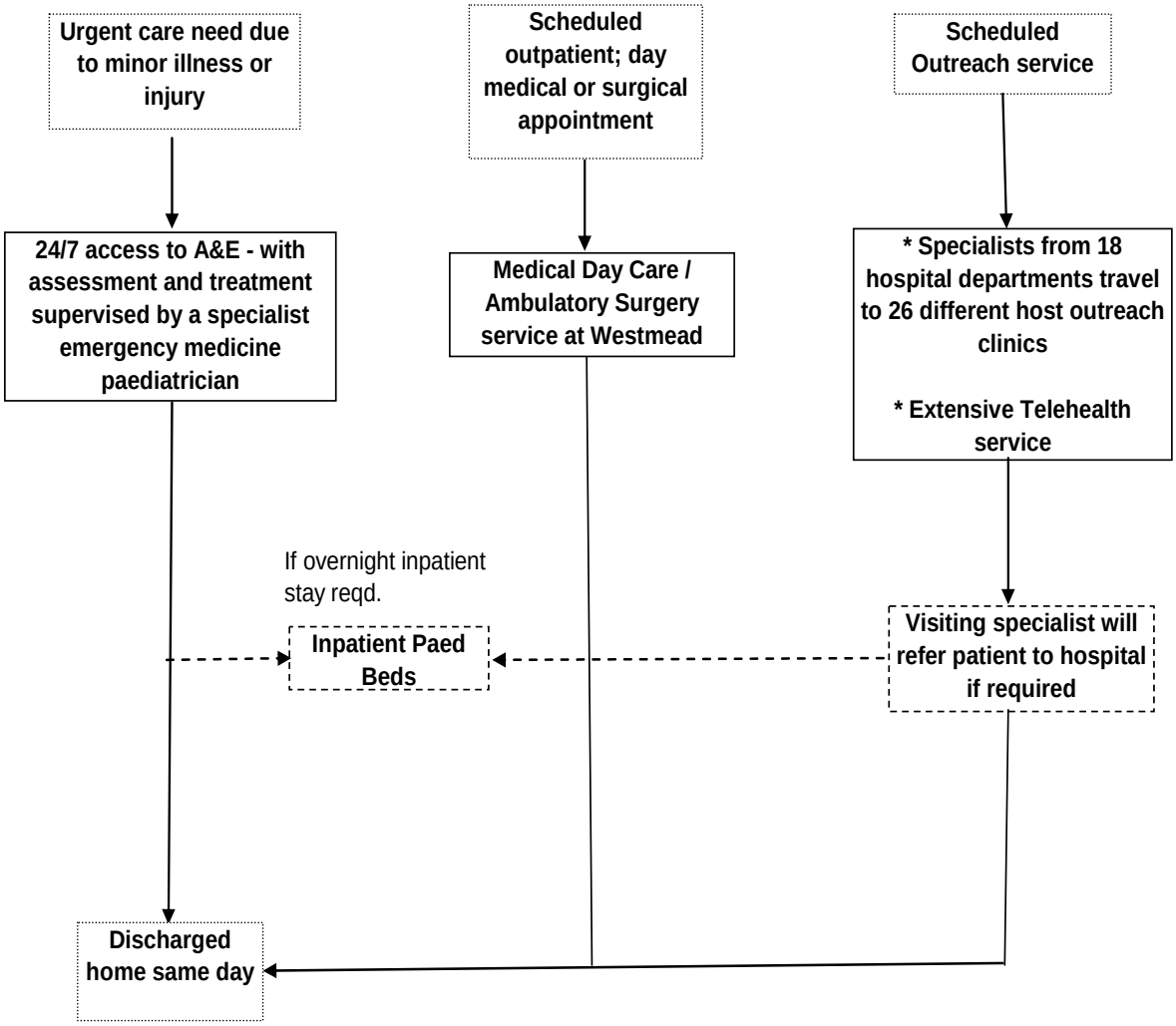
Staffing

- Full range of general and specialist paediatricians and paediatric qualified nurses.

Secondary / Tertiary Relationship

- Provides full range of emergency, community medical and tertiary services for all of New South Wales.

Westmead Children's Hospital, Westmead (nr Sydney), Australia



Starship Children's Hospital, Auckland, NZ

Introduction

Dedicated national paediatric hospital in central Auckland located on the Auckland City Hospital site

Urgent Care

- Provided primarily via the Children's Emergency Department at Starship
- Caters for children from 0-15 yrs of age from the Auckland region
- Approximately 32k attendance per year.

Day Stay Unit

- Small paediatric nurse-led unit with multi-disciplinary support
- Surgical and medical interventions and investigations e.g. Dental, ENT, Gastroenterology, General Surgery, Orthopaedic, Chronic Pain Service, Dermatology, Endocrinology, Gastroenterology, Immunology, Renal, Respiratory, Blood Tests, CT, MRI, Nuclear Medicine
- Provide on-going treatment on a day attendance basis rather than keep a child in hospital.

Outpatient and Outreach

- Clinics for the Auckland region are provided at 4 different locations including the Starship
- Approximately 45 medical outreach clinics are provided in localities throughout the country by visiting paediatric specialist teams
- Approximately 48k outpatient visits per annum
- Outreach surgery services are also provided by the Day Stay Unit at peripheral hospitals -
    - Aiming to be closer to patient's home thus reducing transport and parking issues for families, maximise use of expertise, improve theatre utilisation, and keep waiting lists low
- Part of the New Zealand TelePaediatrics Service that links remote sites with medical centres using videoconferencing facilitating paediatric evaluations, updates, education support and knowledge sharing.

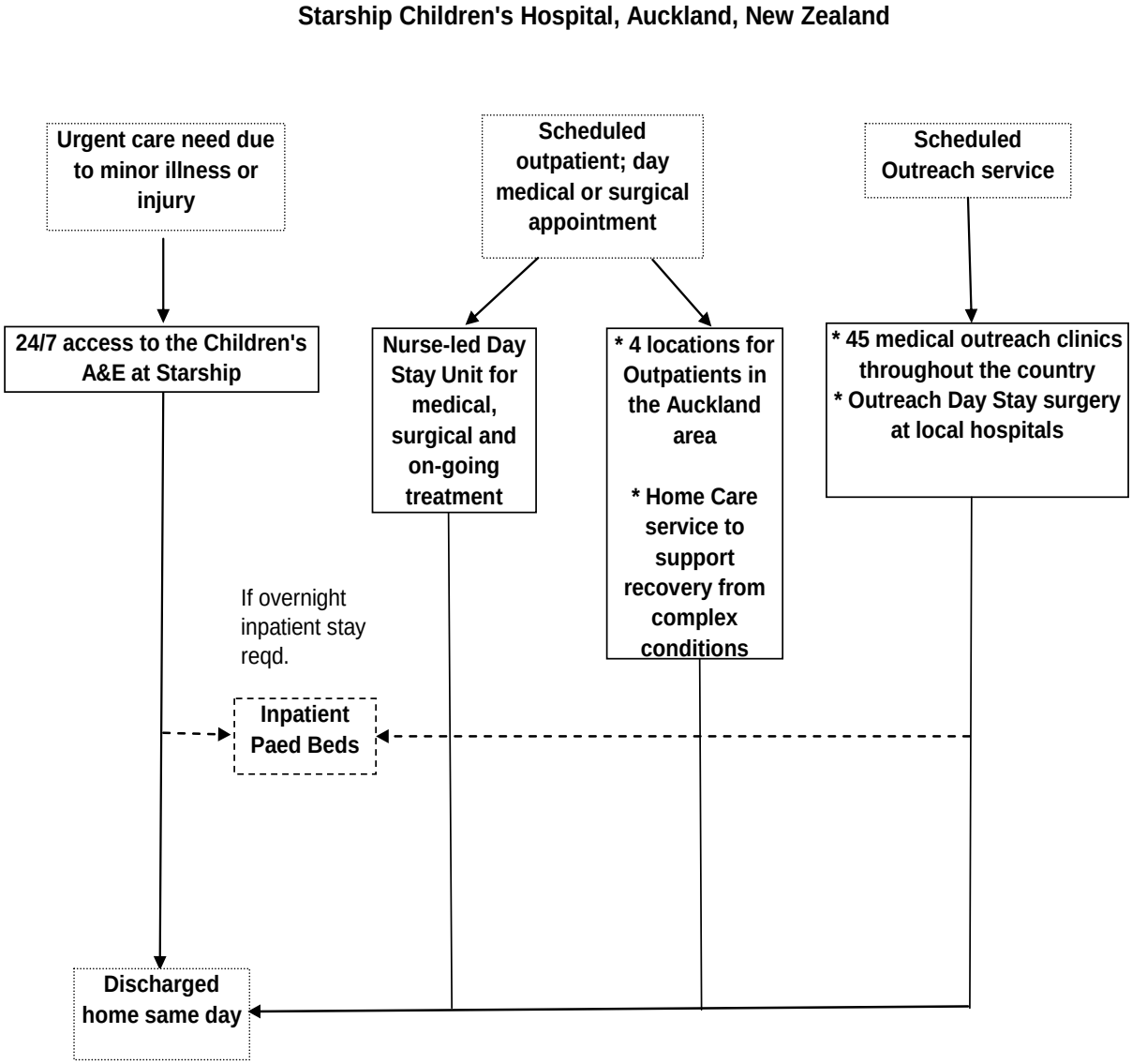
Home Care

- Community nursing intervention for children living in or attending school within the area covered by the local health board
- Fixed interval case management in that patients are discharged from the service and care is transferred to GPs when clinically appropriate
- Support the management of complex medical and surgical conditions providing IV therapy, regular injections, wound care, respiratory assessments, monitoring of complex medical conditions, educative support
- Work in liaison with families, school nurses and other health professionals

- Weekday service with 1 nurse on weekend cover for children that need daily attention
- 5.9 WTE paediatric trained and experienced community nurses
- There are approximately 50 new referrals and discharges per month with a monthly caseload of about 250
- Referrals are received from The Starship and from other community-based health professionals.

Tertiary / Secondary Relationship

- Full secondary and substantial tertiary provision on-site at the Starship
- Combined PICU and Cardiac ICU providing national tertiary support.



Children's Hospital at Karolinska University Hospital, Stockholm, Sweden

Introduction

The Karolinska is one of the largest hospitals in Scandinavia providing secondary and tertiary healthcare for adults and children. It has two paediatric centres, the Astrid Lindgren's Children's Hospital in Solna and the Children's Hospital in Huddinge. In total Karolinska provides 75% of the hospital-based paediatric care in Stockholm.

Urgent Care

Both Solna and Huddinge have dedicated Emergency Rooms treating children for predominantly medical conditions. Solna also has a separate Surgical Emergency Room for wounds, fractures and other acute emergencies.

Ambulatory Care

Medical day care is provided centrally in a 12 bed day care unit. This is supported by 12 paediatrician-led outpatient clinics.

The Surgical Reception provides ambulatory type treatment receiving referrals from GPs and other hospitals as well as follow-up treatment appointments from a previous attendance to the Children's Surgical Emergency Room.

Home Care

A significant amount of general and sub-specialist paediatric care is provided as an outpatient service or in the home where possible. "Institutional", that is, inpatient hospital care is limited to that which is clinically necessary.

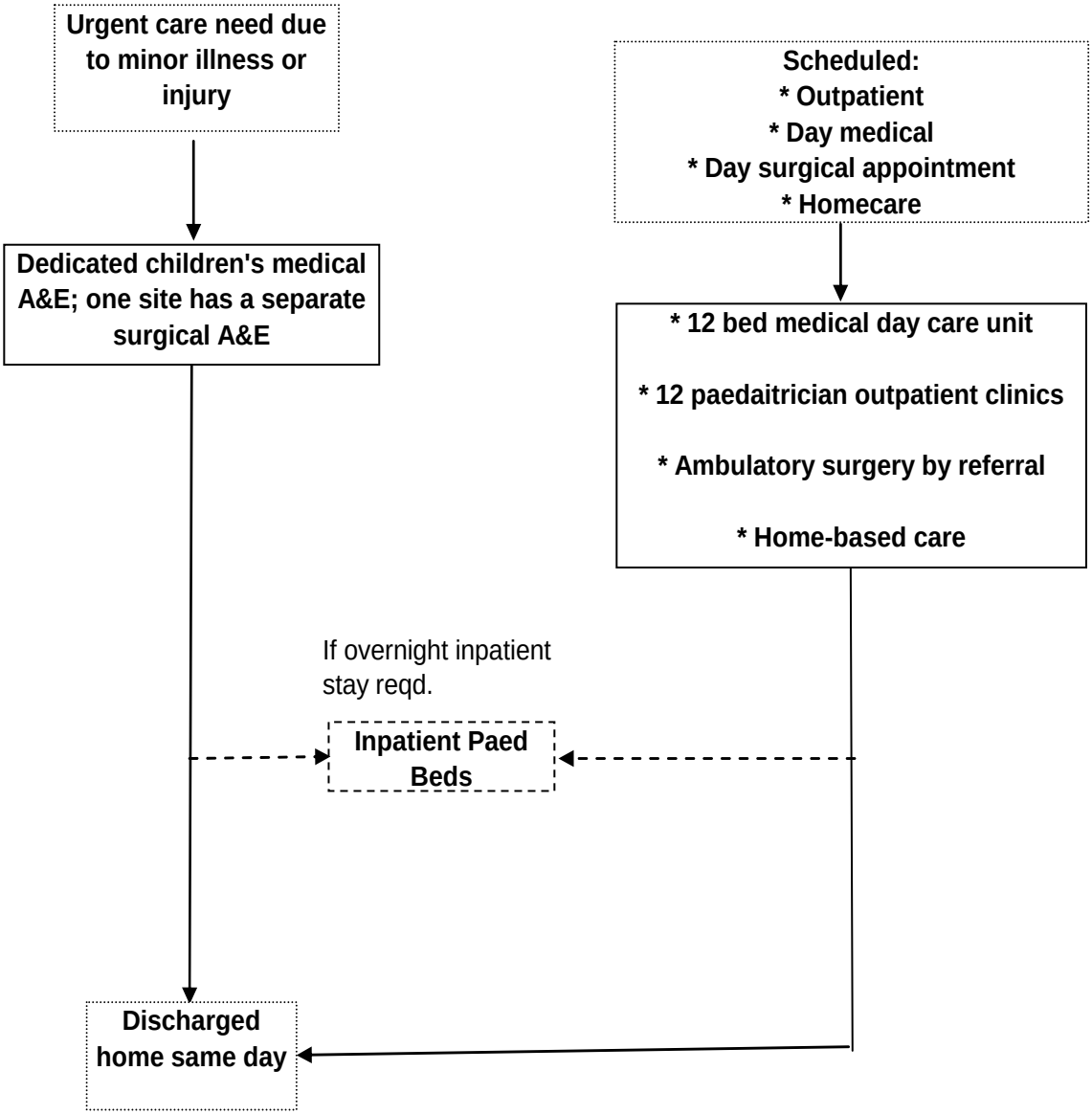
Staffing

As a significant provider of secondary and tertiary medical and surgical services from two hospital sites with inpatient facilities it has a full complement of generalist and specialist paediatricians, paediatric anaesthetists, nurses, clinical support staff and play therapists.

Tertiary / Secondary Relationship

The Children's Hospital at Karolinska provides secondary and tertiary paediatric services for the greater Stockholm area.

Children's Hospital at Karolinska University Hospital, Stockholm, Sweden



Homerton Hospital NHS Foundation Trust

Introduction

- On non-paediatric hospital site
- Children's Emergency Assessment Unit (CEA) is a separate children's A&E department located close to the Primary Urgent Care Centre (PUCC) and adult A&E and operates 24/7
- PUCC operates 07.00-22.00 Mon-Fri and 09.00-22.00 Sat-Sun -
  - A&E level access to diagnostics
  - CEA has observation beds
  - Admission rights to Starlight (inpatient) Unit
  - Most patients discharged
  - Staffed by 3 Paediatric Nurses, a Paediatric SpR and SHO (also cover Starlight inpatients)
  - 24 on-call Paediatric Consultant (OOH from home).

Urgent Care

- The CEA is separate from adult A&E
- Patients registered in the CEA
- Staffed by paediatric trained nurses
- 1x Triage Room (history/observations/initial assessment)
- 2x Waiting areas – 1x for Triage (post registration), and, 1x for Doctor's consultation / treatment (post triage)
- 3x Consultation Rooms
- 1x Treatment Rom
- 1x Breastfeeding Room
- 2x Resuscitation Bays (ring-fenced for Paeds) in main A&E. Accessed via secure door and corridor with electronic access for CEA/Paed staff only
- Clinical support functions shared with A&E – however if a child has to leave the secure CEA area then they are accompanied at all times by a Paediatrician (as well as a parent)
- Electronic A&E type event logging and management system.

Starlight Unit (Ambulatory Care)

- **Observation Area -**
  - 5 bed / cot (flexible) – Max. 4 hr stay
  - Children's play area and table and chairs for feeding
- **Ward Area -**
  - 24-48 hour inpatient stays

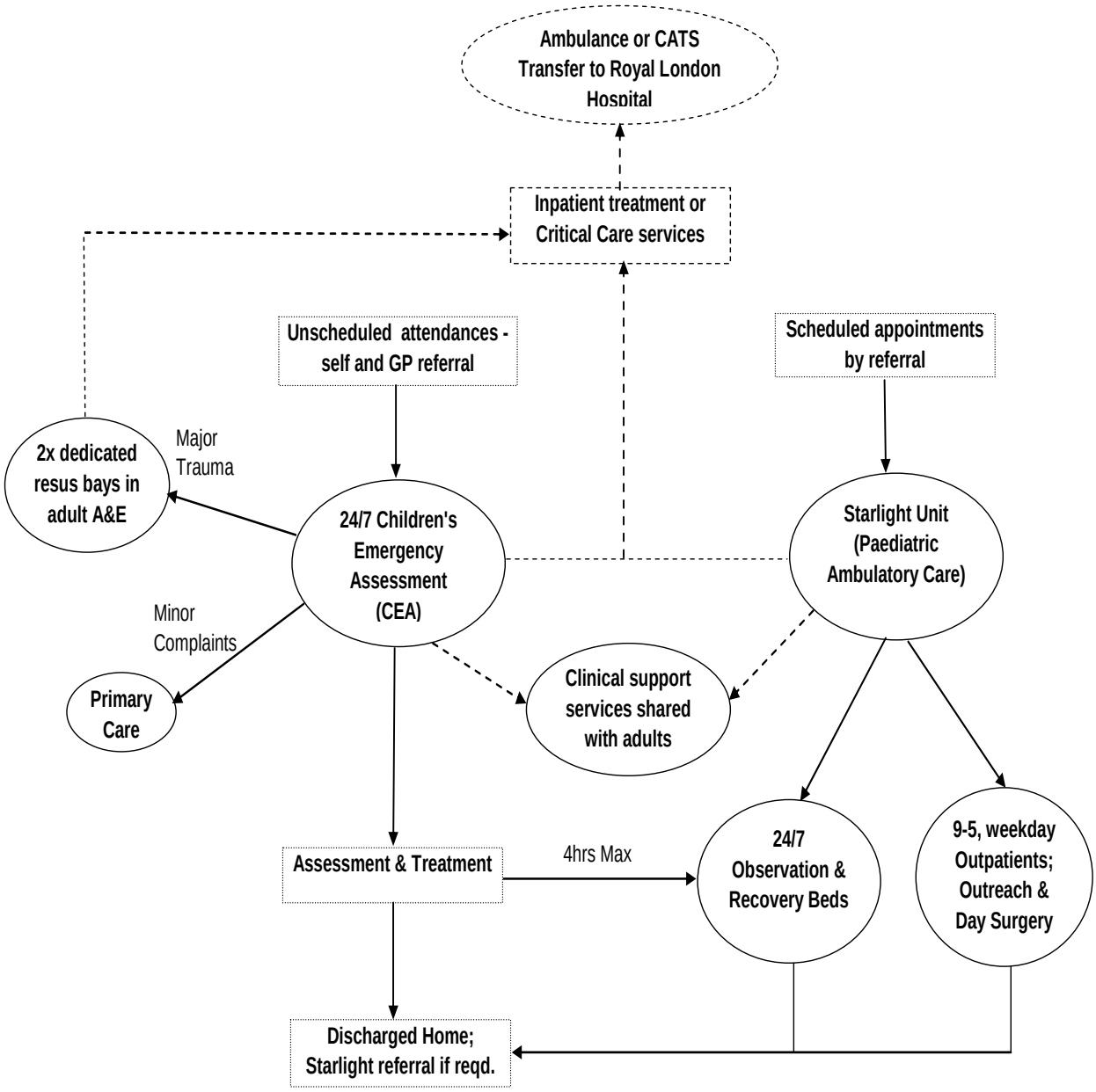
- 1x Quiet Room
  - For dying or dead child to facilitate quiet family grieving
  - Religious texts provided (Bible, Torah and Koran)
  - Parents can be with their children for as long as they wish – there is no time limit
  - Also used for difficult situations e.g. to facilitate supervised mother and child meetings for mental health inpatient whose child is in foster care
- 1x Seminar Room – for daily handovers, MDTs, meetings and training
- 2x 2 bedded adolescent bays – for child and parent, en-suite, dining area
- 1x Teen Room – Leisure / "chill-out" area stocked with TV / DVDs / Table Football / books / magazines / notice board and leaflets – adolescent targeted health advice re drugs / sexual health / smoking etc
- 1x Children's Play Room – large, well-provisioned with furniture, toys, arts and crafts material, bright, colourful and airy - ample natural light (ceiling to floor windows)
- 2x 4 bed bays
- 3x single bed cubicles (with folding bed for parent) – 1x special care/HDU
- Staff station – with counter, phones and PCs – EPR implemented but with continuing teething problems
- 1x Treatment Room – including secured medicines cupboards. (Full protocol-led nurse-dispensing in place including labels etc. to reduce discharge delays.)
- 1x Parents' Room – comfortable seating, tea/coffee/water facilities, sandwiches and fruit provided
- 1x Kitchen

- **Outpatient Clinics –**
  - Hard and soft play areas
  - 5x Consultation Rooms
  - 2x Treatment Rooms
  - Generally operates 9-5 5 days a week
  - Some clinics held later (up to 19.30) on an ad hoc basis depending on consultant and parent availability
  - Some nurse-led clinics
  - Outreach clinics provided by Moorfields, Gt Ormond St, and The Royal London
- **Day Surgery (Elective) -**
  - All day Thursday
  - Minor low-risk procedures
  - ENT and General Surgery on alternate weeks (e.g. removal of foreign objects, insertion of grommets, dental extractions, tonsils in the future, circumcision, hernias, scar revisions, MRI scans)
  - All done under general anaesthetic – by a paediatric anaesthetist that works four sessions at Homerton – 2x adult and 2x paeds (also trains a local

anaesthetist on paed procedures). Substantive post is as a Paediatric Anaesthetist with the Royal London

- **Staffing –**
  - 7x Paediatric Consultants (with sub-Specialty/special interests) (9-5 with rotational 24/7 on-call), 12x Paediatric SpRs and 6x SHOs (3 shifts providing 24/7 cover)
  - 6x Nurse practitioners, 10x Senior staff nurses, x staff / junior nurses (12 hour shifts providing 24/7 cover)
  - CEA – 4 nurses during day, 2 nurses at night, overlap of shifts during (twilight?) peak attendance times
  - Starlight – 4 Nurse Practitioners during day and 3 during night + senior staff and junior staff cover
- **Secondary / Tertiary Relationship -**
  - Gt Ormond St regularly transfers patients back to Homerton for follow-up treatment

Homerton Hospital: Paediatric Ambulatory & Urgent Care



Lincoln County - Paediatric Emergency Assessment and Day Unit

Introduction

- 8am – 7pm Mon-Fri
- OOH, weekends and bank holidays emergency assessments service is provided by the inpatient ward
- Day surgery attendances commence at 08.30
- 9 assessment beds – used for observation, assessment, treatment and recovery
- No overnight stays – all patients are either discharged home or transferred to the paediatric inpatient ward (24 bed, located adjacent to the unit) if required for overnight observation
- Any 'overspills' are assessed on the inpatient ward
- The assessment unit has 4x side rooms used for consultations and 1x treatment room.

Urgent Care

- The unit receives emergency referrals from GPs, Midwives, Health Visitors, Children's Community Nursing Team. Known patients with chronic conditions have open access.
- Patients (or parents) cannot self-refer to the unit
- All types of illness and injury dealt with, major trauma automatically goes to A&E
- Same day appointments given in all cases
- Every discharged child has 24 hr open access post-discharge just in case - but rarely used, more likely that parents phone in to be reassured
- Approx. 1200 patients treated per annum combined during normal working times and out-of-hours.

Day Surgery

- Daily morning and afternoon sessions
- Up to 8 patients per day, approx. 900 patients treated per annum
- Children below 3yrs of age are definitely operated under the care of a named dedicated Paediatric Anaesthetist – suggested that there are several paediatric anaesthetists working for the hospital
- Specialties: General Surgery, ENT, Ophthalmic, Orthopaedic, Tonsils (AM list only as 6hrs post-op recovery time required).

Outpatient and Outreach

- All general, Specialty and tertiary outreach (cardiology, genetics, plastics, Urology) clinics take place in the main Outpatient department – NOT on the ambulatory/urgent assessment unit
- However, there are daily attendees to the unit by GP referral, for blood tests, allergy tests, food challenges, and other minor medical procedures.

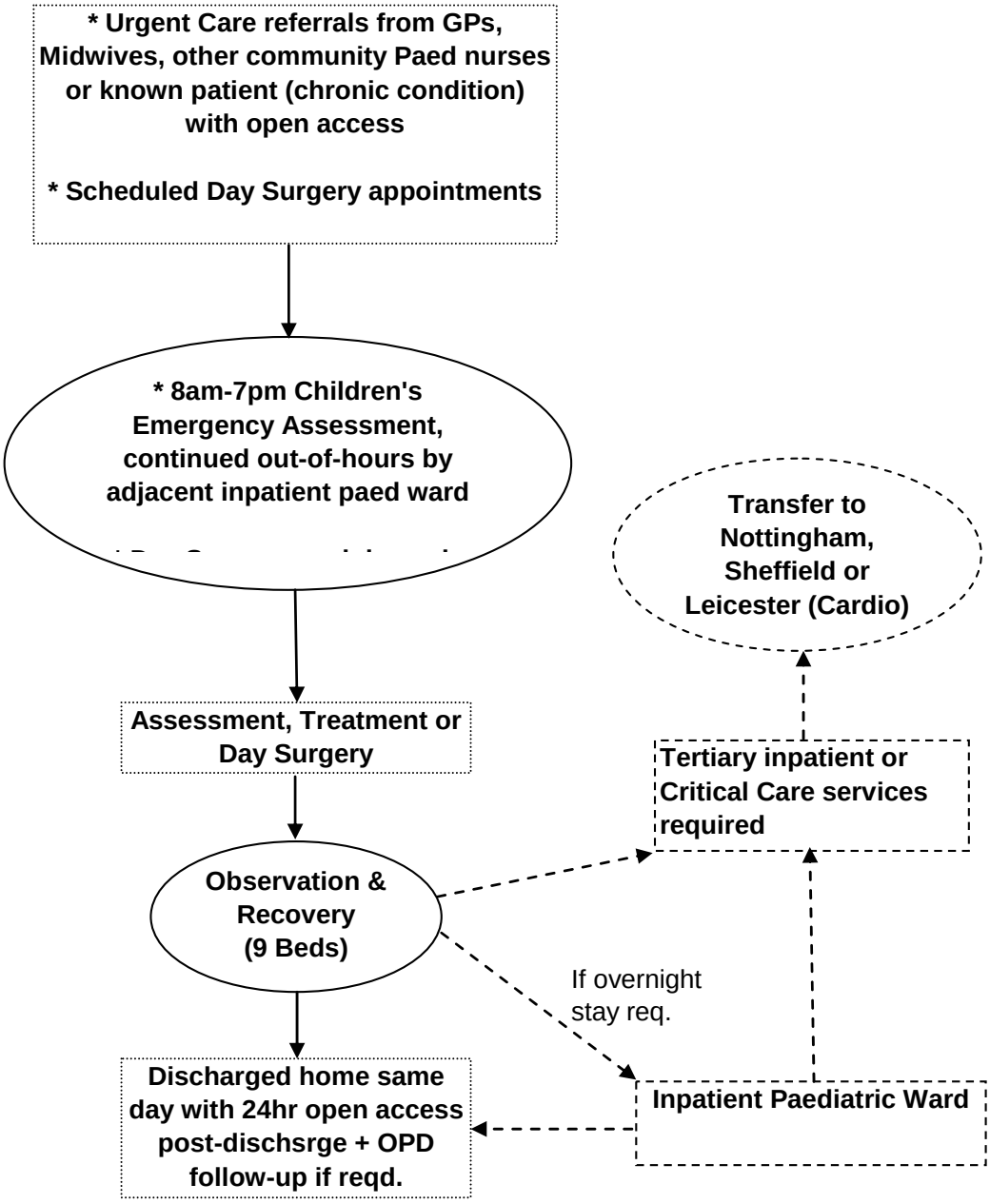
Staffing

- 2 – 3 trained nurses on the morning shift
- 2 trained nurses on the afternoon shift
- 1 x healthcare assistant morning and afternoon
- 1 x play specialist 9-5 weekdays
- 1x Consultant (9-5 but on-call rota), 1xSpR (24/7) and 1xSHO (24/7) – cross-cover the inpatient ward.

Tertiary / Secondary Relationship

- PICU and any tertiary transfers to Nottingham or Sheffield
- Cardiology PICU transfers to Leicester
- Secondary inpatient care provided on-site.

Lincoln County: Paediatric Emergency Assessment & Day Unit



Grantham, Lincolnshire – The Kingfisher Paediatric Ambulatory Care Unit

Introduction

- 10.00 - 17.00 Mon-Fri
- Except day surgery attendances commence at 08.00
- No overnight stays – all patients are either discharged home or transferred to other sites if requiring overnight observation or inpatient treatment
- All patients are discharged by 16.30, any that need overnight stay are transferred to other sites
- Total of 10 beds – used for observation, assessment, treatment and recovery, these include: 1x single room, 1x 4 bed bay, 1x 5 bed bay
- 3x consultation rooms and 1x treatment room.

Urgent Care

- The unit receives emergency referrals from GPs, Midwives, and direct from their own A&E
- The A&E has a designated Paed area but all children are triaged by A&E nurses and treated by A&E doctors
- Paediatricians only attend A&E if on-site during the Ambulatory Unit's working hours and if called to do so on a case by case basis
- Patients (or parents) cannot self-refer to the unit.

Day (minor) Surgery

- 1 morning (only) session per month
- 4 patients only
- Do not operate on children below 2yrs of age
- Specialties include: General Surgery, ENT, dental extractions, occasional minor Urology procedures and, occasional minor Orthopaedic.

Outpatient and Outreach

- General paediatric clinics, daily morning and afternoon
- General surgery clinic - once a month
- Dermatology outreach clinic - once a month (by Trust Dermatologist)
- Cardiology outreach clinic - once a month (from Leicester)
- Dietician outreach clinic - once a fortnight (presumably PCT)
- Attention Deficit Hyperactivity Disorder and behavioural outreach clinic - once a week provided by a Community Paediatrician

Staffing

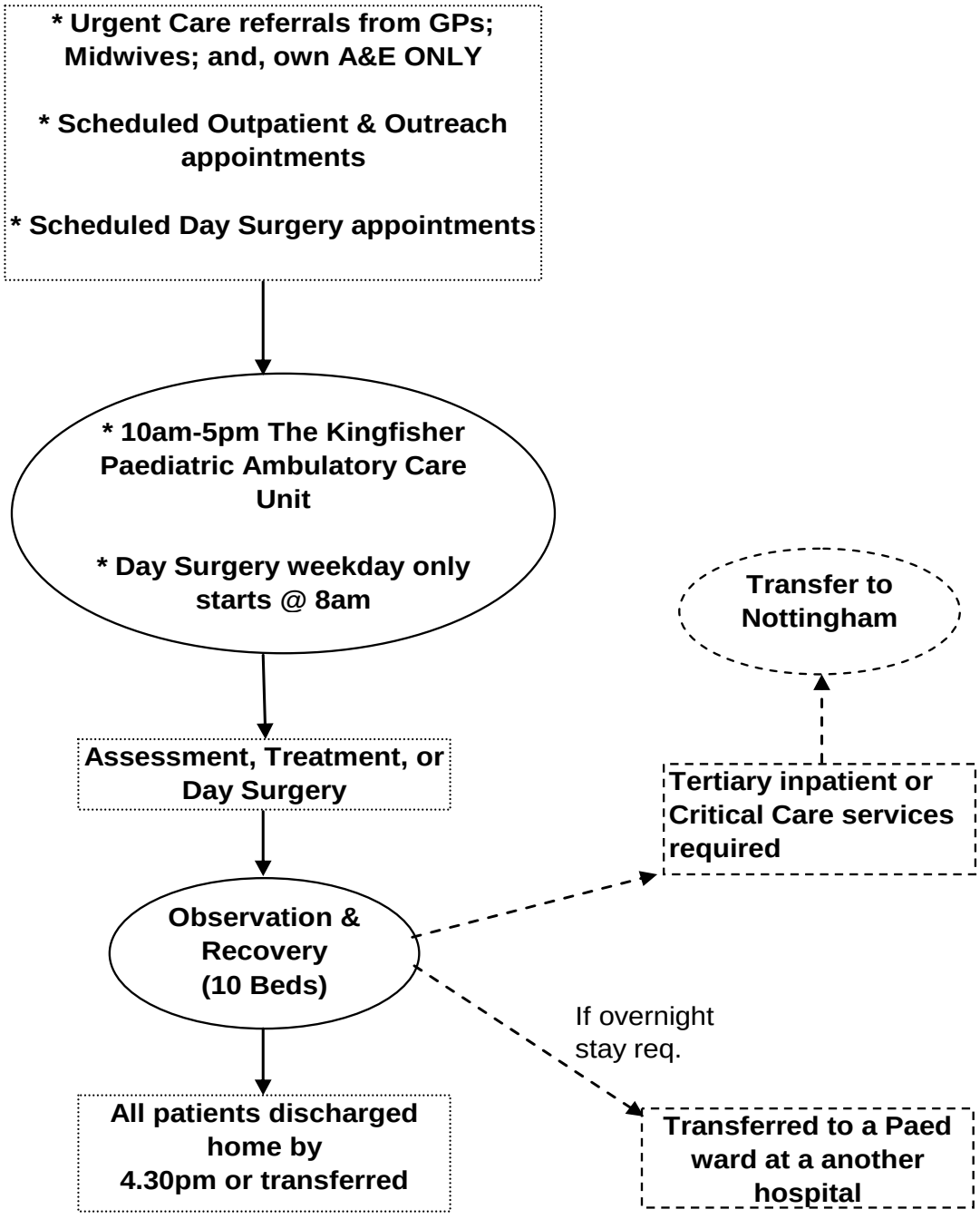
- 6.42 WTE (1wte - senior nurse, 2.39wte staff nurses, 0.5wte play worker, 1.53wte healthcare support workers)

- 1 WTE receptionist
- 1x Consultant and 1x SHO, occasionally 1xSpR -
  - Mon, Wed and Fri - from Boston
  - Tue and Thu - from Lincoln
- General surgeon retiring next month - so future for day surgery and outpatients uncertain
- No named Paediatric Anaesthetist - has left and not been replaced. Current anaesthetic activity is presumed (by the Unit's sister) to be undertaken in rotation by anaesthetists qualified in paediatrics.

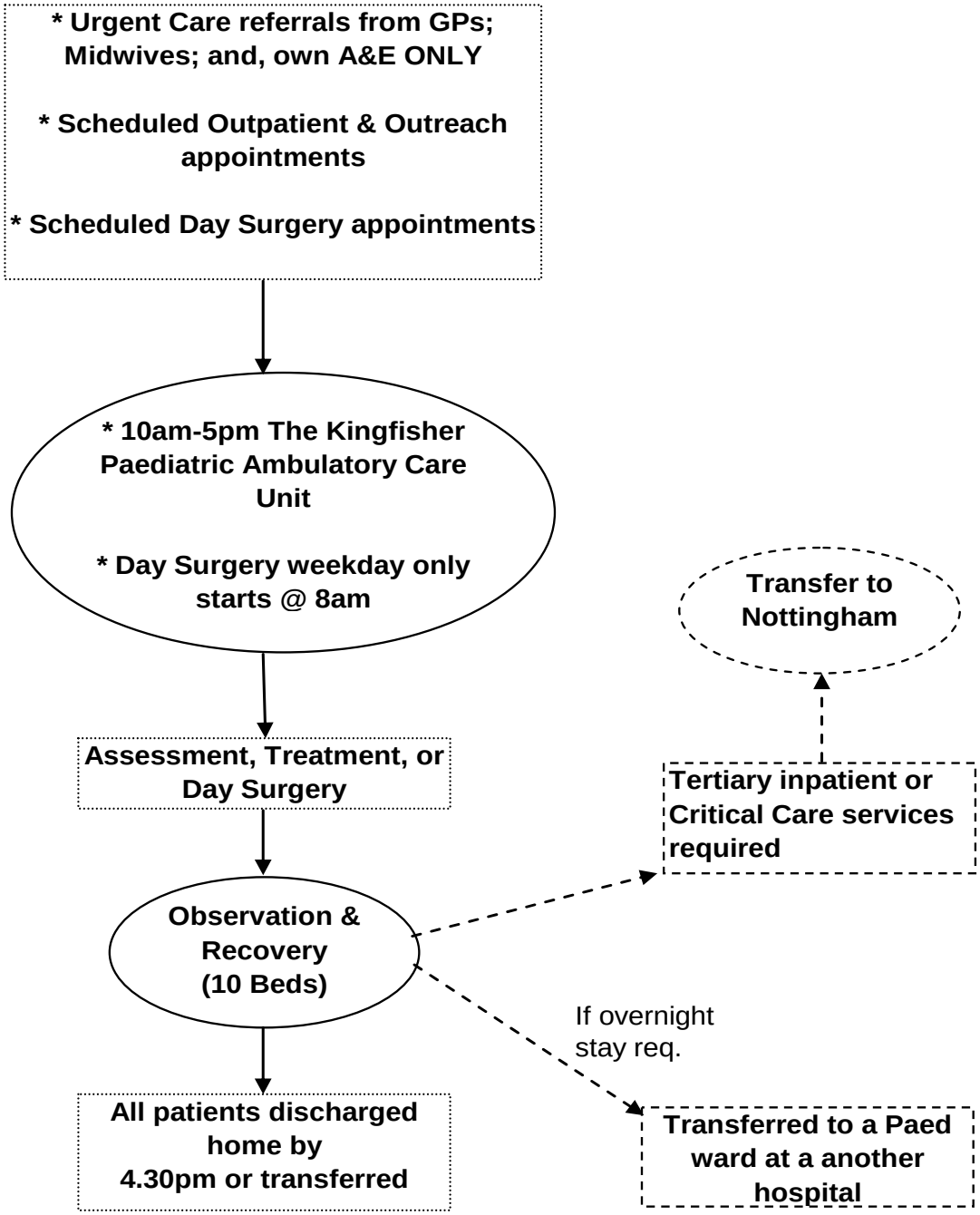
Tertiary / Secondary Relationship

- PICU and any tertiary transfers to Nottingham
- Cardiology PICU transfers to Leicester
- Secondary inpatient care to other acute sites in the same Trust with paediatric inpatient capacity.

Grantham - The Kingfisher Paediatric Ambulatory Care Unit



Grantham - The Kingfisher Paediatric Ambulatory Care Unit



Appendix 2

Travel Time Analyses

Assessment of ambulatory care centre scenarios

Conor Teljeur - Trinity College Dublin

A study was undertaken to assess different combinations of sites as potential ambulatory care centres for paediatric services. The combinations of sites were to be assessed on grounds of geographic accessibility by both public and private transport.

Definition of sites and scenarios

The selected potential sites are as follows:

- Mater Misericordiae (MM)
- Tallaght Hospital (TH)
- St. Columcille's (SC)
- St. Vincent's (SV)
- North County Dublin (NCD)
- Beaumont Hospital (BH)
- Connolly Hospital(CH)

The following nine scenarios were defined:

1. MM
2. MM/TH
3. MM/SC/TH
4. MM/SV/TH
5. MM/NCD/TH
6. MM/BH/TH
7. MM/CH/TH
8. MM/SC/NCD/TH
9. MM/CH/SC/TH

Data

The area used in this analysis is that defined as the secondary catchment of the proposed paediatric hospital. That area is defined as counties Dublin, Kildare, Wicklow and part of Meath.

The population data used were projected small area populations for 2016 using CSO regional projections as a basis. Small area figures take into account percentage town or city population and current population density as a proxy for possible future expansion. County development plans were assessed to identify areas of likely growth and expansion. Upper and lower bands for the 2016 population were generated by using the maximum and minimum populations projected using the different migration/fertility scenarios available.

Populations are centred on a population weighted centroid for each Electoral Division (ED) found using the GeoDirectory housepoint data.

Travel times by private transport (i.e. car) were computed using the Ordnance Survey digital road network and appropriate average travel speeds. Attainable speeds are a compromise between peak and off-peak speeds.

Travel times for public transport include travel by Dublin Bus, Bus Eireann, Irish Rail Intercity and Suburban services, Luas, Dart and pedestrian. A distance of 1200m is taken as an acceptable maximum distance to walk to or from a stop. Travel times are based on published timetables with an additional 10 minutes given for waiting for a service (7 minutes for Luas).

For a given ED, the percentage travelling by public transport has been estimated to be a value between zero and the percentage households with no car. A range of values are tested as part of the sensitivity analysis.

Deprivation information is derived from the 2002 SAHRU Deprivation Index. This is a ten level index where 1 refers to the least deprived 10% of EDs and 10 the most deprived 10% of EDs. The index is computed using five census variables that act as indicators of deprivation: unemployment, housing tenure, low social class, car ownership and overcrowding.

Methodology

Patients are assigned to sites using a spatial interaction model (SIM). In this case a singly constrained model is used as the number of patients originating from an ED is fixed but the number that can be treated at any site is elastic. The distance decay model used in the SIM is a distance power curve (i.e. $f(d_{ij}) = d^{-n}$). From previous work it is known that there is a rapid fall-off of interaction with distance for hospital services (i.e. patients from an ED will generally attend the nearest hospital but some will travel further). This model tends to mimic real movements more realistically than simply allocated patients to the nearest site.

For each scenario, the following algorithm is used:

1. For each ED randomly pick a population between the lower and upper bounds available
2. For each ED pick a random value between 0 and the percentage households with no car as the percentage using public transport
3. Pick a random distance decay parameter between the upper and lower bounds provided
4. Determine the numbers of patients travelling from each ED to each site using public and private transport
5. Record the assessment parameters (e.g. average travel time, percentage patients within 30 minutes, etc)
6. Repeat steps 1 to 5 up to 1000 times for sensitivity analysis

By allowing the various parameters to vary it is possible to establish the extent to which the estimates are affected by the choice of parameter values.

Notes

The percentage patients in each deprivation decile sums across sites.

The total number of patients is calculated at the total number of under 16s in the catchment area.

Values from the sensitivity analysis have not been included as the observed ranges tended to be very small. The inclusion of the additional figures would make the tables more difficult to read without adding sufficient information to be of use.

Different total populations can be seen in each table. This is due to the use of sensitivity analysis with random parameter changes. The values used in the tables are the average values observed across 1000 analyses. The differences are small most tables having total populations in the region of 389,400.

Scenario 1

Measure	MM
Patients	389610
% Patients	100.0
Average time	56.5
% < 15 min.s	3.0
% < 30 min.s	15.9
% < 45 min.s	41.5
% < 60 min.s	69.7
% Dep. Level 1	100.0
% Dep. Level 2	100.0
% Dep. Level 3	100.0
% Dep. Level 4	100.0
% Dep. Level 5	100.0
% Dep. Level 6	100.0
% Dep. Level 7	100.0
% Dep. Level 8	100.0
% Dep. Level 9	100.0
% Dep. Level 10	100.0

Scenario 2

Measure	MM	TH	All
Patients	162855	226620	389475
% Patients	41.8	58.2	100.0
Average time	43.7	45.2	44.6
% < 15 min.s	7.1	9.7	8.6
% < 30 min.s	32.0	40.6	37.0
% < 45 min.s	58.0	60.0	59.1
% < 60 min.s	82.9	74.8	78.2
% Dep. Level 1	38.8	61.2	100.0
% Dep. Level 2	33.2	66.8	100.0
% Dep. Level 3	38.7	61.3	100.0
% Dep. Level 4	39.2	60.8	100.0
% Dep. Level 5	36.9	63.1	100.0
% Dep. Level 6	50.3	49.7	100.0
% Dep. Level 7	42.0	58.0	100.0
% Dep. Level 8	46.5	53.5	100.0
% Dep. Level 9	36.7	63.3	100.0
% Dep. Level 10	51.1	48.9	100.0

Scenario 3

Measure	MM	TH	SC	All
Patients	157515	155017	76806	389337
% Patients	40.5	39.8	19.7	100.0
Average time	42.2	42.9	37.3	41.5
% < 15 min.s	7.4	13.9	15.4	11.6
% < 30 min.s	33.5	45.4	62.4	44.0
% < 45 min.s	60.7	61.2	74.2	63.6
% < 60 min.s	85.2	76.2	80.7	80.8
% Dep. Level 1	36.2	35.6	28.2	100.0
% Dep. Level 2	31.5	43.0	25.5	100.0
% Dep. Level 3	39.6	51.4	8.9	100.0
% Dep. Level 4	40.5	49.0	10.5	100.0
% Dep. Level 5	30.1	19.5	50.4	100.0
% Dep. Level 6	49.5	37.7	12.8	100.0
% Dep. Level 7	36.6	18.9	44.5	100.0
% Dep. Level 8	44.6	35.5	19.9	100.0
% Dep. Level 9	35.7	48.3	15.9	100.0
% Dep. Level 10	50.5	39.2	10.3	100.0

Scenario 4

Measure	MM	TH	SV	All
Patients	149012	216973	23486	389471
% Patients	38.3	55.7	6.0	100.0
Average time	43.0	45.4	36.6	43.9
% < 15 min.s	7.8	10.1	19.6	9.8
% < 30 min.s	32.4	40.8	54.5	38.4
% < 45 min.s	59.5	59.1	71.9	60.0
% < 60 min.s	84.3	74.1	83.4	78.6
% Dep. Level 1	31.8	53.8	14.5	100.0
% Dep. Level 2	29.5	65.3	5.2	100.0
% Dep. Level 3	37.5	60.7	1.9	100.0
% Dep. Level 4	37.8	59.4	2.8	100.0
% Dep. Level 5	28.3	59.2	12.5	100.0
% Dep. Level 6	46.3	48.7	4.9	100.0
% Dep. Level 7	37.9	55.0	7.1	100.0
% Dep. Level 8	44.4	52.5	3.1	100.0
% Dep. Level 9	34.6	61.5	3.8	100.0
% Dep. Level 10	48.7	48.4	2.8	100.0

Scenario 5

Measure	MM	TH	NCD	All
Patients	111462	226661	51292	389414
% Patients	28.6	58.2	13.2	100.0
Average time	40.4	44.7	34.9	42.2
% < 15 min.s	10.4	9.7	10.3	10.0
% < 30 min.s	44.2	41.3	42.7	42.3
% < 45 min.s	65.3	60.9	82.1	64.9
% < 60 min.s	81.8	75.8	94.8	80.0
% Dep. Level 1	22.1	60.7	17.1	100.0
% Dep. Level 2	23.0	66.9	10.1	100.0
% Dep. Level 3	21.5	61.0	17.5	100.0
% Dep. Level 4	21.6	60.2	18.2	100.0
% Dep. Level 5	26.2	63.8	10.0	100.0
% Dep. Level 6	28.6	47.7	23.6	100.0
% Dep. Level 7	28.3	58.6	13.2	100.0
% Dep. Level 8	18.1	52.4	29.5	100.0
% Dep. Level 9	30.6	64.8	4.7	100.0
% Dep. Level 10	47.0	49.9	3.1	100.0

Scenario 6

Measure	MM	TH	BH	All
Patients	77053	234297	78088	389438
% Patients	19.8	60.2	20.1	100.0
Average time	42.5	45.1	32.5	42.0
% < 15 min.s	14.8	9.3	14.6	11.5
% < 30 min.s	43.1	40.5	51.2	43.2
% < 45 min.s	58.1	60.5	83.9	64.7
% < 60 min.s	76.8	75.3	93.8	79.3
% Dep. Level 1	13.7	62.7	23.6	100.0
% Dep. Level 2	17.6	68.5	13.8	100.0
% Dep. Level 3	15.3	63.2	21.5	100.0
% Dep. Level 4	13.7	63.2	23.1	100.0
% Dep. Level 5	15.0	65.0	20.0	100.0
% Dep. Level 6	18.1	50.2	31.7	100.0
% Dep. Level 7	15.3	59.4	25.3	100.0
% Dep. Level 8	15.6	53.9	30.5	100.0
% Dep. Level 9	18.4	66.3	15.3	100.0
% Dep. Level 10	35.2	52.1	12.7	100.0

Scenario 7

Measure	MM	TH	CH	All
Patients	137786	186197	65297	389281
% Patients	35.4	47.8	16.8	100.0
Average time	42.6	44.1	37.7	42.5
% < 15 min.s	8.4	11.7	13.3	10.8
% < 30 min.s	36.4	47.0	52.1	44.1
% < 45 min.s	59.6	60.1	73.2	62.1
% < 60 min.s	82.4	74.7	83.1	78.8
% Dep. Level 1	32.9	51.3	15.8	100.0
% Dep. Level 2	29.6	56.4	14.0	100.0
% Dep. Level 3	28.1	49.4	22.5	100.0
% Dep. Level 4	27.5	25.9	46.6	100.0
% Dep. Level 5	34.9	59.8	5.3	100.0
% Dep. Level 6	45.8	42.1	12.1	100.0
% Dep. Level 7	39.4	53.9	6.8	100.0
% Dep. Level 8	34.9	49.5	15.6	100.0
% Dep. Level 9	32.8	58.3	8.9	100.0
% Dep. Level 10	45.3	40.3	14.3	100.0

Scenario 8

Measure	MM	TH	SC	NCD	All
Patients	104209	155889	76928	52404	389430
% Patients	26.8	40.0	19.8	13.5	100.0
Average time	37.8	42.3	37.1	35.2	39.1
% < 15 min.s	11.2	13.9	15.4	10.0	12.9
% < 30 min.s	47.7	46.3	62.5	41.8	49.2
% < 45 min.s	70.4	62.2	74.6	81.1	69.3
% < 60 min.s	85.3	77.4	81.1	94.4	82.5
% Dep. Level 1	19.1	35.2	28.3	17.4	100.0
% Dep. Level 2	21.0	43.1	25.5	10.4	100.0
% Dep. Level 3	21.5	51.9	8.9	17.7	100.0
% Dep. Level 4	22.0	48.7	10.4	19.0	100.0
% Dep. Level 5	19.4	19.9	50.6	10.2	100.0
% Dep. Level 6	27.2	36.0	12.4	24.4	100.0
% Dep. Level 7	23.0	19.2	44.6	13.2	100.0
% Dep. Level 8	15.9	34.8	19.8	29.4	100.0
% Dep. Level 9	29.3	49.7	16.2	4.8	100.0
% Dep. Level 10	45.9	40.4	10.3	3.4	100.0

Scenario 9

Measure	MM	TH	SC	CH	All
Patients	129150	112170	77748	70411	389479
% Patients	33.2	28.8	20.0	18.1	100.0
Average time	40.4	40.5	37.0	37.9	39.3
% < 15 min.s	9.0	19.2	15.3	12.4	13.8
% < 30 min.s	39.2	56.1	63.9	51.1	51.1
% < 45 min.s	63.6	61.9	75.4	72.8	67.1
% < 60 min.s	85.2	76.5	80.7	83.1	81.4
% Dep. Level 1	29.4	24.4	29.2	17.0	100.0
% Dep. Level 2	27.1	31.4	26.0	15.5	100.0
% Dep. Level 3	27.7	37.1	8.8	26.3	100.0
% Dep. Level 4	26.9	16.6	8.2	48.3	100.0
% Dep. Level 5	27.9	16.3	51.2	4.6	100.0
% Dep. Level 6	44.2	30.6	12.2	13.0	100.0
% Dep. Level 7	33.6	15.3	45.1	5.9	100.0
% Dep. Level 8	32.2	30.9	21.0	15.9	100.0
% Dep. Level 9	31.5	41.6	17.2	9.8	100.0
% Dep. Level 10	44.0	30.4	10.1	15.5	100.0

Interpretation

There are a number of grounds on which scenarios can be compared and assessed. For example, it may be desirable to simply minimise the average travel time. Alternatively, it may be desirable to select sites that attract similar numbers of patients. Depending on the selection criteria, different scenarios may be preferable. Analysis will focus primarily on the three and four site scenarios.

Equality of demand

In the three site scenarios, the St.Vincent's and North County Dublin sites produce low demand leading to the remaining sites having enlarged catchments. The selection of the Beaumont site impacts primarily on the Mater site leaving a large demand for the Tallaght site. There is greater equality in the four site scenarios, particularly Scenario 9. The importance of this measure relates to disproportionate demand for services at one or few sites which may lead to increased waiting times at those sites.

Average travel time

In terms of average travel times, scenarios with the same number of sites tend to produce similar averages as well as proportions of patients within 15, 30, 45 and 60 minutes. While a two site model makes a distinct improvement on a single site model, additional centres have less impact.

Deprivation

A desirable attribute of any given selection of sites would be that patients with different levels of deprivation are spread proportionately across sites. Morbidity rates tend to be higher amongst more deprived populations so that a hospital with a disproportionately high percentage of highly deprived patients in its catchment would have an increased demand for services.

The catchments for the North County Dublin and St. Vincent's sites have low percentages of highly deprived individuals meaning that they will treat a more affluent population while the Mater, Tallaght and Blanchardstown sites have more deprived populations.

Future transport developments

There is substantial speculation on the future provision of additional tram lines and the introduction of Metro routes. These changes will primarily affect suburbs in the North and West of the city to the benefit of sites in Blanchardstown and Tallaght. For these sites there will be improved access for suburbs such as Clondalkin. New routes will also affect North County Dublin although that is more likely to increase flows from North County Dublin to the city centre than vice versa.