



Working Together Programme: Children's Work-stream

Best Practice Guidance for the Configuration and Provision of Children's Surgery.

**Linda Daniel
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This best practice document is based on a review of literature and standards published by Royal Colleges and other bodies in relation to both the elective and non-elective children's surgery pathway.

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1. INTRODUCTION AND CONTEXT

Surgery on children is carried out in tertiary centres by paediatric surgeons and in some specialities e.g. plastic surgery by 'adult' surgeons (surgeons who primarily operate on adults but who also operate on children). In addition to this, a significant amount of relatively straight forward general, orthopaedic, urology and ENT surgery is carried out by 'adult' surgeons in DGH's. Most surgical procedures performed on children are elective, relatively straightforward and performed in the district general hospitals as day case procedures. However children can become acutely ill requiring surgery very rapidly but have greater potential for full recovery. Their greater vulnerability means that the effects of delays intervening or errors when commencing treatment can be amplified to a considerable degree. The children's surgical pathway encompasses primary, secondary and in certain cases tertiary care. This best practice document is based on a review of literature and standards published by Royal Colleges and other bodies in relation to both the elective and non-elective children's surgery pathway.

1.1 Challenges to the future provision of DGH services

Over the last decade, a number of key documents published by the Royal Colleges have highlighted the issues and challenges facing the provision of children's surgery in the DGH's¹. At a Yorkshire and Humber level these challenges have been raised by stakeholders (surgeons, anaesthetists, Trust managers and commissioners) and identified as the key drivers for the Working Together Programme at meetings in 2014 summarised below.

- Providing a comprehensive range of effective and sustainable children's surgery and anaesthetic services.

Changes in clinical practice has been influenced in recent years by guidance from the Royal College of Surgeons (RCS) and Royal College of Anaesthetist (RCOA) and an increased focus on clinical governance.

One of the more significant changes has been to the training of general surgeons, with a reduction in the paediatric component of general surgical training. Individual general surgical trainees have been given free remit to choose any subspecialty area, and there has been no attempt to match the numbers training in any given sub-specialty area to the needs of the service. As a result, as surgeons retire, they are not being replaced by surgeons with the same level of experience in paediatric surgery.

There is evidence that concern about the ability to provide safe and effective surgery for children has caused some surgeons to limit the range of surgery that they offer, or limit the age range of children that they treat.

¹RCPCH. Facing the Future: Standards for Paediatric Services. 2011. London.

Royal College of Surgeons National Confidential Enquiry into Patient Outcome and Death. Surgery in Children: are we there yet? NCEPOD 2011

Children's Surgical Forum, Ensuring the provision of general paediatric surgery in the district general hospital RCS 2010

Children's Surgical Forum, Surgery for Children: delivering a First Class Service. RCS 2007

- Avoiding unplanned unmanageable changes to referral patterns for children’s surgery. Within the region there is evidence that the issues identified above have resulted in unplanned changes to service provision and ‘activity flows’ away from smaller DGH’s towards larger centres, leading to problems in capacity planning. There is recognition among clinicians that transformation of services may be required to make best use of clinical manpower, and that this needs to be addressed strategically.

- The need to ensure continues access to local surgical and anaesthetic services.

A central principle of the NHS is to provide services to ensure children are treated safely in an appropriate environment that is as close to home as possible. Commissioners are central to shaping NHS services and, when making decisions regarding services needed in their area will have improving patient outcomes at the forefront of their minds.

- The need to consider clinical interdependencies

The provision of children’s surgical and anaesthetic services is dependent on the provision of other children’s services and vice versa; in particular the provision of a number of children’s services relies on the provision of paediatric anaesthetic services. Therefore, changes to individual services can have an impact on the overall ‘portfolio’ of services offered by a particular Trust.

- Implementation of the Standards for Children’s Surgery and Anaesthesia lead to challenges that are beyond the ability of individual organisations to solve.

There is widespread recognition that meeting the standards in full may be a challenge for some Trusts. The view among clinicians is that there are options for addressing these (e.g. through the provision of in reach and outreach services, joint training, education and audit), but that this would require joint working. There is also the view that for the standards to be effective, they should be monitored by people who understand the services and who are able to make informed assessment against compliance; ideally peers. Also, that the standards will need to be reassessed in light of changes to national clinical guidance, in order to remain relevant.

1.2 How do these challenges affect Children’s Surgery and Anaesthesia?

The overwhelming view from attendees at stakeholder meetings was that

- There is a need for change ‘continuing as we are is not sustainable’.
- Ensuring good quality and sustainable provision of services in future and implementation of standards would require cross-organisational working.
- There is lack of co-ordination across pathways and patient flows are not managed.
- The interdependencies of children’s services are complex.
- There is a need for managerial leadership and clinical leadership across organisations.

2. CHILDREN'S SURGERY SERVICE MODELS: LITERATURE REVIEW

When considering the commissioning of children's surgical services, children should be treated locally where safely possible and centrally where necessary. The RCPCH and RCS advocate provision of children's surgical services configured into local provider networks² which must have appropriate governance systems, clinical leadership and transfer arrangements in place. The standards⁴ highlighted that complex care should be centralised, day surgery where possible should be maximised, and "occasional practice" should be viewed as undesirable especially if elective. The care of unusual or complex conditions is concentrated in specialised settings, which is part of the direct specialised commissioning function of NHS England⁵. This expectation by the RCS is that the majority of children's surgical services should be designed and delivered as part of an appropriately resourced network that works closely with clinicians from all disciplines and with commissioners, for the benefit of children and their carer's. The operational detail is left for local commissioners and providers to determine, however there are some very clear principles namely:

- The network must have a clear governance infrastructure and refer to national standards and outcomes of care.
- There should be an identified clinical network lead.
- There must be regular (at least annual) network review of patient outcomes and experience.
- From a CCG point of view the RCS suggest that a network is supported by contractual agreements that specify service requirements and outcomes and has appropriate administrative and financial resources.
- The network will therefore need to work closely with commissioners regarding objectives and work plans.
- Section 6 of this 2013 publication sets out the standards in detail, including detailed standards and suggested measurement criteria in each of 5 domains – Configuration / Governance & leadership / Education and training / Patients and families / Delivery and environment of care.
- Finally the RCS set out a view that the number of specialist paediatric surgeons should be increased.

Reviewing the literature available the following is a summary of operational models.

2.1 East Midlands Commissioning Framework: A network approach to General Paediatric Surgery in the East Midlands.

The East Midlands Strategic Clinical Network in conjunction with specialised commissioners have developed a commissioning framework for General Paediatric Surgery. The delivery model for GPS will vary from provider to provider, based on local work-force and out-reach

² Royal College of Paediatrics and Child Health: Bringing Networks to Life – An RCPCH guide to implementing clinical networks. London, RCPCH, 2012.

³ Children's Surgical Forum: Ensuring the provision of general paediatric surgery in the district general hospital. London, The Royal College of Surgeons, 2010

⁴ Children's Surgical Forum: Standards for Children's Surgery. London The Royal College of Surgeons, 2013.

⁵ NHS England. NHS Standard Contract for Paediatric Surgery: surgery (and surgical pathology, anaesthesia and pain). London, NHS England, 2013. <http://www.england.nhs.uk/npc-crg/group-e/e02/>.

arrangements from tertiary units, with the one aim that the standard of care is equivalent in all units and the best interests of the child are paramount. As a minimum, services should be age appropriate, safe and effective and delivered as locally as possible by appropriately trained professionals with the right education, training, knowledge and skills. All units will contribute to the GPS Clinical Network, which will have a remit for driving continuous quality improvement and support commissioning in the oversight and monitoring of standards.

In summary: The principles of both the elective and emergency GPS models are:

- All children will be treated by appropriately trained professionals – i.e. staff with the right education, training, knowledge and skills to provide high quality care in an environment suitable for their needs which is genuinely child centred.
- All surgical specialties involved with children will be organised effectively to ensure that routine services are available locally.
- All units contribute to a clinically managed network with regional MDT meetings and regional audit programme.
- All units will be measured against regional quality/performance standards to ensure the same standard of service is achieved in all units.

Consensus was reached between those involved in the review that GPS will be delivered either by outreach from paediatric surgeons from the specialist centres via a formal service level agreement, or by Trusts with adult surgeons who have appropriate competencies and supporting infrastructure to undertake GPS safely and sustainably. The requirements to assess competency and infrastructure are stipulated in the clinical standards.

The Children's Surgical Forum (2010) does not make recommendations regarding a particular lower age limit or volume of cases undertaken to assure competency. The guidance stipulates that occasional practice is undesirable and that safe practice is dependent upon the appropriate competencies within an individual Trust. Therefore no formal thresholds are in place.

Furthermore Trusts are required to ensure that the competencies of adult surgeons undertaking surgery on children are monitored as part of annual appraisal and re-validation.

The advocacy for the introduction of clinically managed networks for children's surgery is widely evident in a plethora of recent Royal College and DH guidance. It was the view of the review team that in order for GPS to continue to be delivered safely, and for there to be robust collaborative work-force planning, the commissioning framework must be supported by a clinically managed network.

The establishment of a network enables centralised monitoring of performance and outcomes, ensuring that there is equity of provision, such that a child treated in any unit within the network receives equivalent high quality standards of care. The network enables a regional approach to increased quality, and will include enhanced productivity and efficiency through cost effective pathways which get it right first time. In order to promote a comprehensive and integrated approach to GPS, all units delivering GPS will be expected to

be part of the GPS Network and participate in Network meetings. The Network will provide clinical leadership and professional peer review to Network members in order to facilitate compliance with the model and clinical standards.

2.2 National Steering Group for Specialised Children's Services 2009 Scottish Government Document⁶.

This report was commissioned to review the totality of children's care, rather than just surgical, however section 7 sets out considerations around surgical models of care and briefly laid out below:

Joint Regional Appointments

A specialist surgeon has a dual appointment between a specialist hospital and another centre. This currently exists in orthopaedics in the SYB. This post must be in addition to staffing complement of the specialist centre, since withdrawal of an existing slot will weaken that specialist base. Such posts, moreover, conform to the projected status of MCNs with the ambition of fusion of local and regional planning. It has advantages over the out-reach model in that the integration of the practitioner into both hospitals seems to yield a better level of investment, and ability to produce clinical leadership than one given "visitor/out-reach" status.

Benefits:

- Local patients have access to specialist on a regular albeit less than whole time basis.
- Provides in-house support for the non-specialist staff and improves training opportunities.
- Promotes opportunities to give advice and share clinical opinion with potential is for general upskilling.
- Facilitates communication with specialist centres and allows earlier repatriation of complicated children into their own locality with options on local follow-up.

Dis-benefits:

- Increased travel – cost and lost clinical time.
- Lack of a 24/7 emergency cover of a consistent level,
- Administrative difficulty in managerial terms of creating a job "shared" by different budget holders with possibly differing levels of commitment to that appointment.
- Organisational clinical governance arrangements need to be absolutely clear.

⁶ <http://www.specialchildrensservices.scot.nhs.uk/Documents/org00005.pdf>

Joint appointment to several hospitals

This is a variation of Joint Regional appointment (above) which allows a single surgeon to support more than one district general hospital when these are suitably located geographically.

Benefits:

- Local standards are maintained at a specialist hospital level, a permanent 'paediatric surgical presence', directly or indirectly, is provided in the DGH.
- Communication channels between other adult general surgeons looking after children and paediatricians, and between the DGH and Specialist Hospital are facilitated.
- Formal and informal paediatric surgical CPD can be a regular feature for surgical and paediatric staff

Specialist Out-Reach with Local Lead

A way to provide specialist presence and specialty support for a non-specialist unit. Such an arrangement is helped by geographic proximity of the "recipient" unit to the "donor" unit. Both elements of this model are important, as it tends to focus strongly on the elective component alone, leaving emergency provision as a very separate set of problems. This would need careful thought

Network of DGHs

In England there are, in densely populated urban areas, multiple hospitals relatively close to each other, and it is being proposed that the lead children's surgeons of each form a network which provides continuous availability of clinical expertise.

In-House Lead General Surgeon

- As a model of service delivery this represents status quo, which as outlined earlier is not sustainable, due to the difficulties besetting succession on account of the changes to preparatory training.

DGH Specialist with in reach to specialist centre

- The appointment of a paediatric surgeon to a large DGH with elective clinical sessions in the specialist hospital might be a model which appropriate for specific locations.
- This would cater well for elective surgery and share the same limits for emergency surgery as the other models, but for the fact that the surgeon would be able to provide a rostered emergency cover for children in the DGH if he/she so wished, and a purely elective service in the specialist centre.

Tiered Levels of Care

- At its heart this is simply a method of grouping age, complexity of condition, and available facilities and support, into categories which may allow hospitals to determine their current and future service strategy.
- It was suggested such tiering may help direct a planning process to areas where there is either sufficiency or inadequacy of resource for the population.

2.3 NW England – Dr Anne Hoskins presentation to the NCEPOD conference following the 2011 report.

Three issues led to the establishment of the networked model

- year on year increase in children being referred to children’s hospital for surgery
- limited no of procedures being carried out by surgeons in some DGH
- Different models of paediatric surgery care and networks across the northwest.

The NW SHA led the development of a paediatric surgical network - region wide. This included a network director with support and the network had a core role around establishment and monitoring of standards and performance. There was alignment with the quality observatory.

The network role is to

- set standards
- monitor and evaluate
- define what surgery being undertaken and timing
- explore concentration of services across network (some specialise in x, some in y)
- education and competency maintenance

2.4 Hub and spoke – networks. McNally / SW England

Ideally a hub and spoke model, with surgical centres drawing patients from surrounding centres, allows the NHS to accurately redistribute its resources and manpower according to the need to create equality. McNally⁷ made a clear recommendation for a paediatric surgical provider network across SW England.

This followed an external Review of General Paediatric Surgical Services in the South West in 2008. That review recommended retaining the existing service model - “hub & spoke” but to strengthen it by the creation of a Paediatric Surgical Network.

Tertiary centre

- Tertiary Paediatric Surgery Department at Bristol Royal Hospital for Children (BRHC), 4 paediatric surgeons and 2 paediatric urologists.

⁷ <https://www.rcseng.ac.uk/surgeons/supporting-surgeons/regional/docs/janet-mcnally-session-2>

- The tertiary centre provides 24 Hour Emergency Service supported by a NICU, PICU and full range of paediatric specialists
- The tertiary centre clinicians doesn't routinely operate in DGH (large geographic footprint across the SW)
- "Hub & spoke" model with outreach clinics throughout region
- Neonatal and Paediatric Retrieval Teams
- BRHC always available for consultation/backup

General Paediatric Surgery in the ten DGHs in SW England

- General surgeons and/or urologists with an interest in paediatric surgery perform general paediatric surgery of childhood
- Elective surgery: inguinal hernias, hydroceles, palpable undescended testes, umbilical hernias, circumcision
- Emergency surgery: appendicitis, pyloric stenosis, acute scrotum, intussusception & incarcerated hernias in some hospitals
- There are no specialist paediatric surgeons in the DGH's in the SW.

The network is intended to strengthen collaboration between DGH's and specialist paediatric centres, to move care closer to home where possible, to ensure timely succession planning for key clinicians and ensure high quality training and to ensure good quality audit of outcomes.

The network has developed 60 standards for Paediatric surgery with the involvement of all DGH and the specialist centre. There is an ongoing programme of self -assessment against these standards. The network has strong paediatric anaesthetist support, a strong nurses' forum and has been felt to improve collaboration and engagement between sites.

The presentation highlights that some fundamental issues such as succession planning have not yet been solved, and there is a sense of less responsibility to local population.

Being watchful of potential dangers of hub and spoke.

There is a body of evidence that patients have a better survival if their operation is in a high-volume surgical centre. It should be noted that this observation is highly procedure specific. There is research (for eg lung cancer surgery⁸) showing that patients first seen at a surgical centre are more likely to have surgery than patients who were not first seen in a non-surgical centre.

⁸ Thorax 2011;66:1078–84.

A 2015 study in Nottingham⁹ tested a hypothesis of whether surgical patients first seen in the “hub” of a hub and spoke model were more likely to receive surgery than patients first seen in a “spoke”. **The hypothesis was proven; the study concluded that surgical centres that serve the largest catchment populations have high resection rates for patients first seen in their own centre but, in contrast, low resection rates for patients first seen at the surrounding centres they serve.**

The Khakwani study demonstrates the need to ensure that service design facilitates all patients, including those first seen at non-surgical centres, to have equal access to surgery. The study has highlighted the key role that the surgical centres with large catchment populations can play in improving the surgical resection rates in England and the need to provide equal access to this service. Obviously this was research done in the context of adults and lung cancer, perhaps a generalisable point was that if a hub and spoke model is adopted, attention will be required to patients seen in the spoke centres getting equitable care.

2.5 Monitor – 2015. International Models of Acute Care

Monitor¹⁰ recently published a document exploring some international models of acute care and other potential service innovations.

This explored a number of potential models for future service design and configuration. Many of these were well beyond paediatric surgery, but the general lessons are applicable.

Networks, transfers systems and protocols

- **The most important enabler of the tiered system was the use of networks, facilitated through shared clinical governance and formal patient transfers and protocols.** However, the degree to which networks are used locally to optimise care delivery varies considerably.

Standards, protocols and risk tiering

- **This is particularly common in maternity care, but obviously has implications beyond this.** One of the challenges to tiering in maternity is identifying patients who shift from low to high risk during a care episode. The importance of clearly defined networks and protocols for the support offered by higher risk units, the communication between units to notify of risk changes, and patient transfer or the transfer of staff in, should a greater degree of risk tiering be introduced in the NHS. This has obvious implications if care for a population is shared across many providers in a network of care.

⁹ Khakwani A, et al. Thorax 2015;70:146–151.

¹⁰ Exploring international acute care models. Monitor 2015

- Matching clinical standards to risk tiers is important; given the important role clinical standards have in driving service design. There will be issues in ensuring that the NHS regulatory regime supports any networked model.

Links between surgery, paediatrics and primary care and a shared electronic record, which links almost all paediatric providers.

- This may have length of stay advantages¹¹ and may facilitate faster decision making, reduced duplication of testing, better chronic disease management and safer transfer and hand offs.

Exploring the scope for increasing the use of technology to improve efficiency and patient outcomes within the NHS.

- Technology may enable care to be delivered remotely. For example, the Monitor report found use of electronic intensive care units (eICUs) in the USA. In the US system, spoke sites are supported to provide intensive care services through an eICU hub site. The system uses two-way cameras, video monitors, microphones and a smart alarm connected by high speed data lines (annex 14 to the Monitor report)
- This type of system has also been shown to work for other services such as stroke and dermatology. Obviously the cost of the technology and the benefit it would yield are important return on investment questions, as are ensuring high clinical engagement, shared clinical governance and responsibility arrangements.

Different approaches both to employment arrangements and the use of specific roles.

- **Employment arrangements for clinicians can give providers more flexibility. Credentialing across many sites, admission rights at multiple hospitals.**
- Examples of this contractual model exist in France, Germany, US, and Canada. This may provide greater flexibility to the acute providers for ensuring sufficient clinical cover in and out of hours. The flexibility offered by group practice arrangements may enable clinicians to look after higher volumes of patients across a wider geographical area within a specialty, and so enable better skill development opportunities.

The NCEPOD 2011 Report picked up on this theme and used the phrase **NHS Passport as a means of facilitating Cross-site work** and enabling flexible movement between hospitals for short-term work. This would enable cover for emergencies and absences in short notice and ensure support for clinicians to extend and reinforce their skills

Different role definition could also allow for greater flexibility.

- **Exploring the notion of “practicing at the top of licence” and transferring responsibility to a cheaper resource – nurse / doctor substitution etc.**

Obviously these are not new concepts. It is unknown the extent to which they have been explored locally. These specific examples should necessarily be taken forward in the NHS,

¹¹ Kahn, J.M. (2011) 'The use and misuse of ICU telemedicine', JAMA, 305 (21), 2227–28

especially where they do not reflect the direction of travel locally. However, it does suggest that in service lines there may be some scope for thinking creatively.

3.0 CONFIGURATION OF SERVICES.

The RCS¹² recommend children are treated as close to home as possible by staff with the right skills at centres with the right facilities. Surgical services should therefore be planned and organised to enable children to access routine surgical services locally that meet standards; whilst unusual or complex conditions are concentrated in specialised settings. As a minimum clinical standard set all local DGH services must have the ability to assess, diagnose, resuscitate and stabilise children who require emergency surgical care.

Developing condition-specific guidelines for surgical teams provides a framework by which hospitals could elect to provide a certain level of care (based upon age, condition complexity, and available facilities). This model of risk tiering would require the support of a surgical network to facilitate collaborative working, routes of communication and agreed thresholds for patient transfer for elective and emergency surgery and support commissioning by overseeing and monitoring performance /outcomes. All providers contribute to the network with regional MDT meetings, training and any opportunities for inter-network audit.

An example of a tiering¹³:

The small DGHs should be able to provide resuscitation and stabilisation of all infants and children with surgical conditions. It should be able to provide elective children's surgery depending on the availability of suitably trained surgeons, anaesthetists and other resources. Normally, neonates and infants would not be offered elective surgery. Management of urgent and emergency surgical problems in young children (<5 years) will depend on the training and experience of the available surgeon and anaesthetist and may require transfer to an intermediate or regional centre.

The intermediate centre (large DGH or university hospital) should be large enough to employ specialist paediatric surgeons to undertake GPS or general surgeons with an interest in paediatric surgery who will provide emergency and elective GPS including babies but not normally neonates. There will need to be post-operative care to level 2 PCC.

The specialist or regional/tertiary centre should provide the full range of paediatric surgical care including neonatal, urological and cancer surgery, supported by neonatal and paediatric intensive care and full retrieval facilities. Care will be provided by specialist paediatric surgeons and anaesthetists. General paediatric surgeons from these centres may provide outreach clinics and operating lists in network hospitals.

3.1 Networks

The majority of children's surgical services should be designed and delivered as part of an appropriately resourced network that works closely with clinicians from all disciplines and

¹² Children's Surgical Forum Standards for Children's Surgery RCS 2013

¹³ Children's Surgical Forum Surgery for Children: delivering a First Class Service. RCS 2007

commissioners, for the benefit of children and their carer's. This network may link and may be supported by Strategic Clinical Networks for Children and Maternity (SCN).

The network must have an identified clinical lead and clear governance infrastructure and refer to national standards and outcomes of care. There must be regular (at least annual) network review of patient outcomes and experience. Supported by contractual agreements that specify service requirements and outcomes the network will work closely with commissioners regarding objectives and work plans to:

- Agree guidelines and protocols are in place for managing the full patient pathway and address unwarranted clinical variation.
- Improve access and egress to/from services at the right time.
- Provide a forum and clinical leadership for training and education, sharing best practice and development of the service.
- Ensure processes are in place to identify and monitor network risks and critical incidents.
- Address strategic issues by monitoring and predicting trends in patient flows, matching capacity to demand, workforce and succession planning.

4.0 ORGANISATION AND PROVISION OF CARE: HOSPITAL WIDE

4.1 Governance and leadership

All hospitals that provide surgery for children should have clear operational policies regarding who can operate on and anaesthetise children for elective and emergency surgery, taking into account on-going clinical experience, the age of the child, the complexity of surgery and any co-morbidities. These policies may differ between surgical specialities.¹⁴

Within hospitals providing surgical services for children there must be a commitment from the executive team and senior staff to the provision of a high quality children's surgical service, with a multidisciplinary children's surgery committee reporting to the board.

There is a designated lead responsible for developing children's surgical services provision within their organisation and a defined governance structure to assure the quality of overall care, champion and monitor improvements in the surgical and anaesthetic services. This will be facilitated by regular and systematic capture of patient and carer-reported outcomes, including those admitted for unscheduled care. There is a regular MDT review of patient's outcomes (mortality and morbidity, incident near misses) and experience at least annually¹⁵. The service should submit data on request to agreed regional networks and national audits.

¹⁴ National Confidential Enquiry into Patient Outcome and Death. Surgery in Children: are we there yet? NCEPOD 2011

¹⁵ Royal College Surgeon Children's Surgical Forum. Standards for Children's Surgery. RCS.2013

4.2 Workforce education and training

Mechanisms are in place to assess staff competency and identify training needs. Provision is made in job plans for all staff to participate in training and CPD activities. Networks support, develop and provide CPD. Medical royal colleges set standards for CPD in their respective specialties and provide guidance and tools to support doctors in planning and managing their CPD activities

Surgeons

All surgeons caring for children and young people should undertake an appropriate level of paediatric clinical activity that is sufficient to maintain minimum competencies (as defined by respective Royal colleges) and consistent with their job plans. Mechanisms across clinical networks should be in place to ensure staff competency and identify training needs. Networks should support and develop staff and, when possible, provide continuing professional development (CPD).

Anaesthetists

Anaesthetists, who have completed a UK CCT on the 2010 curriculum, will have successfully undertaken higher or advanced units of paediatric anaesthetic training in the final 3 years of their programme. Normally, this would also be true for anaesthetists still on the 2007 curriculum, but this should be verified at appointment. Anaesthetists appointed from other training schemes or who are moving from another employer must have their paediatric competence assessed for equivalence, usually by a College or Network representative at appointment. Where competence is difficult to assess or considered inadequate, a period of additional training must be arranged as for surgeons described above¹⁶. Anaesthetists with no regular paediatric commitment but who have to provide out of-hours cover for emergency surgery or stabilisation of children prior to transfer maintain their skills in paediatric resuscitation and an appropriate level of CPD in paediatric anaesthesia to meet the requirements of the job

Paediatricians

Universal care (PCC level 1) 24/7 middle grade cover should be provided by a paediatrician in training who has achieved all level 1 RCPCH competencies and passed the MRCPCH examination (typically ST4 or above).

Enhanced care (PCC level 2) 24/7 middle grade cover should be provided by a paediatrician in training who has achieved all level 2 RCPCH competencies (typically ST6 or above). Non-consultant, non-training doctors (staff grade and speciality doctors) and Advanced Nurse Practitioners (ANP's) may be able to provide equivalent expertise and relevant competencies with appropriate training.¹⁷

Support staff¹⁸

The staff assisting the anaesthetist (operating practitioners/assistants anaesthetic/ theatre/ recovery nurses) must have competency and skill in paediatric airway support,

- Invasive and non-invasive ventilation
- Extubation

¹⁶ The Royal College of Anaesthetists (2015) Guidelines for the Provision of Anaesthetic Services. Paediatric anaesthesia services <http://www.rcoa.ac.uk/docs/GPAS-Paeds.pdf>

¹⁷ RCPCH (2014) High Dependency Care for Children: A Time to Move On. RCPCH

¹⁸ Y&H SCN Standards for Children's Surgery and Anaesthesia. 2015

- Recovery
- Resuscitation
- Safeguarding

Nursing¹⁹

Ambulatory care (Emergency departments, outpatients, assessment units minor injury units day care and day Surgery. The RCN²⁰ have identified all staff to be trained in:

Paediatric life support

Safeguarding to level 3

Communication with children and parents

Pain management

Recognition of the sick child

In patient wards the RCN have identified the following trained children's nurses to patient ratio's:

1:3 for children under 2 years

1:4 for children 2 years and over

1:5 at night

There must be a minimum ratio of 1:1 nurses experienced in the post anaesthetic care of children in every area where children are being recovered from anaesthesia.

Generic Training

Paediatric Life Support²¹

Pain management policies are in place and all staff must have basic paediatric resuscitation and life support competencies. The hospital must have sufficient staff with Advanced Paediatric Life Support competencies to maintain a paediatric resuscitation team. All anaesthetists/surgeons must ensure that they have appropriate annual training in paediatric life support/resuscitation. At least one nurse per shift will be trained in advanced paediatric life support (EPLS / APLS).

Pain Management²²

Staff caring for children must be competent in assessment of pain (verbal and non-verbal), use of pain assessment tools suitable for the age and development of child and be able to provide analgesia in a timely manner.

All registered nurses (RNs and RN-Cs) must have received formal training in the use of paediatric pain assessment tools.

Safeguarding²³

Five levels of competence have been identified by the intercollegiate working group. All staff including non-clinical managers working in health care settings must have as a minimum level 1 safeguarding of children training. Anaesthetists should undertake level 2

¹⁹ Royal College of Nursing. Defining staffing levels for children and young people's services.2013

²⁰ Royal College of Nursing (2013) Defining staffing levels for children and young people service RCN

²¹ Royal College Surgeon Children's Surgical Forum. Standards for Children's Surgery. RCS.2013

²² RCS Standards for Non-specialist Emergency Surgical care of children (consultation document) RCS 2015

²³ Intercollegiate Document: Safeguarding Children & Young People Roles and Competences for healthcare Staff RCPCH 2014

with the lead consultant ideally working towards level 3. Staff working with children, young people and/or their parents/carers and who could potentially contribute to assessing, planning, intervening and evaluating the needs of a require level 3 training. Clinical Training must be updated annually.

4.3 Patients and family

Children and families are able to access, at all times, a dedicated member of staff with whom they can discuss (or arrange discussion with the relevant clinician) treatment options, diagnostic findings, expected recovery timescales, complications, etc. There must be a system of communicating the name of the responsible consultant(s) to parent's and families and to enable access to a dedicated member of staff throughout the admission.

The service has arrangements to provide support services such as translation, play therapy and other necessary therapies, social care, interfaith, advocacy advice and support, health visitors and liaison nurses. They should also be involved in the decision to operate and the consent process.

The processes and environment in which surgical and anaesthetic care are delivered should ensure that distress is minimised and parental access is encouraged, e.g. to anaesthetic and recovery areas. Arrangements must be in place to ensure that appropriate and understandable information is provided to parents, including after they have left the hospital and subsequent sources of support. There must be frequent communication with the family throughout the hospital stay, at all times ensuring patient privacy and confidentiality. The service has mechanisms to receive feedback from patients and supporters. The service has mechanisms to receive feedback from patients and supporters.

5.0 DELIVERY AND ENVIRONMENT OF CARE

Children should be treated in safe, suitably staffed and equipped, child and family-friendly environments. A full range of paediatric equipment is available in theatres, recovery areas and all other areas where children are anaesthetised as specified in the RCA standards.

Surgery must be performed by clinicians with the appropriate competencies. This infers completion of a dedicated training programme in paediatric surgery to Certificate of Completion of Training (CCT) level or attainment of a CCT in another relevant surgical specialty, such as general surgery. The range of competencies attained by an individual is specified in the respective curriculum.

5.1 Distinction between elective and non-elective surgical provision.

Most elective surgical procedures performed on children are scheduled relatively straight forward and performed in DGH's as day case procedures. The predictability of elective care results in this service being provided by a core team of staff with a commitment to paediatric care.

Certain non-elective clinical presentations have quite a low intervention rate and a prime function of this service is assessment and diagnosis. Whilst it is not possible to separate this

clinical function entirely from treatment, there is a very reasonable public expectation that accurate assessment of care needs to be locally available. In particular, for every child requiring operative intervention, there are at least an equal number simply in need of assessment and, in the case of suspected appendicitis, for every child undergoing surgery there will be 3 or 4 not requiring surgical interventions but still in need of identical evaluation²⁴. It is for children such as these that an imposition of prolonged travel, through a lack of a local service, is a very unsatisfactory prospect.

Other conditions have an inherent urgency, which also makes delays associated with protracted travel, undesirable (testicular torsion is such an example, where the condition is predominantly in the peripubertal cohort of boys and it is entirely within the scope of an adult general surgeon or urologist for effective treatment within the obligate 6 to 12 hour time period from presentation to testicular necrosis).

The inclusion of medical paediatrics is recommended in all cases of:

- Emergency conditions in children less than 5years,
- Diagnostic uncertainty in children of all ages and
- In the case of children of all ages requiring stabilisation.

As the current syllabus of medical paediatrics includes topics such as diagnosis and management of abdominal pain these clinicians can contribute to peri-operative care of children with surgical illness and assist in the management of co-morbidity. Because of expertise in the management of sepsis and their resuscitative skills in children of all ages, paediatricians are useful partners, along with anaesthetists, in the management of both the critically ill child, but also in younger children and the more complicated aspects of fluid and pain management in surgical patients.

5.2 Elective care standards

Elective surgery for children should, whenever possible, be scheduled on dedicated children's theatre lists. Where this is not possible, cases are scheduled considering the needs of children and carers.

A named consultant paediatrician must be available for liaison and immediate cover, for example in cases of children requiring on-going care following resuscitation, and to advise on safeguarding issues. While such situations are rare, the level of cover should ensure attendance within 20-30 minutes.

5.3 Day Surgery

Children's surgery is provided on a day-case basis wherever practical A named consultant surgeon is responsible for care and a paediatric-trained consultant anaesthetist is present for day-case surgery but can delegate to other grades as appropriate.

A minimum of two registered children's nurses are present in day surgical areas. The outcomes of day-case activity is audited and reviewed. Processes are in place to facilitate transfer within the network should complications arise

²⁴National Steering Group for Specialised Children's Services 2009 Scottish Government
<http://www.specialchildrenservices.scot.nhs.uk/Documents/org00005.pdf>

5.4 Emergency care

The critically ill child with an immediate life-threatening condition is assessed by a senior clinician and the decision to operate or transfer is made promptly, according to network arrangements. Emergency surgery is normally undertaken in hospitals with comprehensive paediatric facilities, 24/7 paediatric cover, children's nursing support and paediatric-competent anaesthetic support. For emergency surgical conditions not requiring immediate intervention, children should not normally wait longer than 12 hours from decision to operate to undergoing surgery, and should be scheduled with consideration for the needs of children and carers.

Surgeons and anaesthetists taking part in an emergency rota that includes children must have appropriate training and competence to handle their immediate surgical and anaesthetic care. Currently standards for non-specialist emergency surgical care of children developed by the RCS are out for consultation incorporating all aspects of the child's pathway from pre-hospital care to discharge.

There is trust/network/health board-wide audit of emergency surgery in children. Emergency children's surgical practice is audited at least annually using routinely collected data. Examples: Time between admission/decision to operate and the operation taking place, length of stay, morbidity and mortality. Audit should include children's surgical transfers and untoward incidents including unplanned re-admissions and unplanned admissions to a critical care unit. Emergency children's surgery is included in inter-network audit of children's surgery.

5.5 Emergency department

Children have access to a child friendly environment in emergency departments. The ED rota includes sufficient cover for emergencies in children at any time.

5.6 Transfers

The critically ill child with an immediate life-threatening condition must be assessed by a senior clinician and the decision to operate or transfer is made promptly, according to network arrangements.

Critical Transfers

These describe transfers of patients from one hospital to another for immediate life-saving intervention at a specialist centre, often (but not exclusively) requiring the use of a retrieval or specialised ambulance transport system. For example, children being transferred for care within an intensive care facility would often be transported by paediatric retrieval teams and not the local Ambulance Service. It is expected that the referring hospital would send suitably trained and senior staff to manage the child on route.

Immediate Transfers

These are emergency transfers of patients from one hospital to another for life or limb saving treatment (ambulance dispatch within the hour) or management, where the patient's

clinical condition must necessitate the use of a fully equipped Accident and Emergency vehicle.

Clinical Transfers

These describe transfers of patients undertaken when the patient's condition is not critical or immediate and their clinical condition does not necessitate the use of a fully equipped Accident and Emergency vehicle. This may also describe transfers of patients with limited mobility, who are monitored and require transportation for assessments, appointments and/or medical investigations. These transfers should be undertaken by the hospital PTS provider – if the statutory ambulance service is used then they will be extra-contractual journeys (chargeable) and would be carried out within 4 hours.

Non-urgent transfers

These describe transfers between hospitals where the patient does not fall into either the critical, immediate or clinical transfer categories. Where a patient is clinically stable, but requires a transfer to another hospital, the responsible clinician must decide the safest and most timely mode of transfer between hospitals, whether through a hospital's transport provider, by a private vehicle or public transport

5.7 Diagnostics²⁵

Hospital inpatients must have scheduled seven-day access to diagnostic services such as x-ray, ultrasound, computerised tomography (CT), magnetic resonance imaging (MRI), echocardiography, endoscopy, bronchoscopy and pathology. Consultant-directed diagnostic tests and completed reporting will be available seven days a week:

- Within 1 hour for critical patients
- Within 12 hours for urgent patients
- Within 24 hours for non-urgent patients

Supporting information:

- It is expected that all hospitals have access to radiology, haematology, biochemistry, microbiology and histopathology

5.8 Anaesthetic and recovery areas

The anaesthetic room is child friendly and parents are supported in comforting their children during induction. In the recovery area, there is a physical separation between children and adult patients. Parents/carers are able to be present with their child when they wake up.

5.9 In –patient Wards

The on-going care of inpatients/postoperative patients is managed by consultant surgeons, with support from consultant paediatricians where necessary, on children's wards staffed by

²⁵ NHS Services: Seven days a Week Forum. Clinical Standards date accessed 10.06.15
<http://www.england.nhs.uk/wp-content/uploads/2013/12/clinical-standards1.pdf>

registered children's nurses and senior surgical trainees (or surgical trust doctors with equivalent competencies).

5.10 Outpatient departments

Whenever possible, children should, be seen in designated children's clinics. When this is not possible, cases should be scheduled with consideration for the needs of children and carers.

6.0 SPECIALITY SPECIFIC GUIDANCE²⁶.

6.1 General Paediatric Surgery (GPS)

GPS involves relatively common disorders that do not require a specialist unit. Urologists perform some general surgery, largely confined to circumcision, and orchidopexy. In DGHs that provide elective GPS, sub-specialisation has evolved with elective surgery provided by one or two general surgeons. In contrast all DGH consultant general surgeons who contribute to the on-call emergency rota have a commitment to provide the emergency surgical service for children in their local population. Emergency and elective workloads differ in the types of conditions treated, age of children and resources required.

Elective care

The most common elective conditions are inguinal hernia, congenital hydrocele, maldescent of the testis, conditions of the foreskin and umbilical hernia. It is recommended that orchidopexy should be performed at age one year or as soon as diagnosed thereafter. Circumcision, is rarely indicated before five years of age and only occasionally afterwards. Other conditions managed by the general surgeon include the removal of skin and subcutaneous soft tissue abnormalities. Depending on local expertise, the practice may be widened to include endoscopic procedures.

Emergency

The most common emergency procedures are appendicectomy (laparoscopic or open), fixation of testes for torsion and incision, and drainage of abscesses. Less common conditions are irreducible inguinal hernia, the acute abdomen from other causes and trauma. All DGH consultant general surgeons who contribute to the on-call emergency rota have a commitment to provide the emergency surgical service for children. If an appropriately trained surgeon is not available nor would be available within the time required to manage a child with a surgical condition, the child should be transferred. Most emergencies occur in older children and can be managed by general surgeons who have not had specific GPS training.

Surgeons

Trusts must ensure that surgeons performing GPS are assessed in this area as part of their annual appraisal/re-validation. Newly appointed surgeons undertaking GPS must have at least 6 months paediatric surgical experience (ST 4 – 6) otherwise, they will be required to

²⁶ Children's Surgical Forum Surgery for Children: Delivering a First Class Service RCS 2007

participate in 1 day case list per week (supervised) for 6 months, or until deemed competent, in the specialist centres, providing exposure to GPS²⁷.

6.2 Urology

Responsibility for childhood urological disorders is shared among specialist paediatric urologists, paediatric surgeons with an interest in urology and adult urologists whose practice includes children.

The emergency workload is low, mainly acute scrotal pathology (notably testicular torsion and trauma), and, in specialist paediatric urology, the management of acute obstruction and infection.

The bulk of the elective non-specialised workload consists of surgery of minor or intermediate complexity (for example, circumcision, orchidopexy, hydrocele surgery), of which an estimated 90% can be undertaken on a day case basis.

More specialised routine surgery includes treatment for urinary tract obstruction, open and endoscopic correction of vesico-ureteric reflux and correction of hypospadias.

Complex specialised paediatric urology includes bladder reconstruction and the management of conditions such as posterior urethral valves and disorders of sex development

6.3 Orthopaedics

Most fracture care should be performed in the DGHs and is generally provided by surgeons who have a mixed adult and children's practice.

For more complex care, a network model is required. In this model the tertiary centre would act as the hub. Such a centre would normally have four to six specialist paediatric orthopaedic surgeons and dedicated fracture clinics. The centre would be capable of treating the multiple-injured child and would have a paediatric ED and critical care unit for all major specialties. The tertiary centre would normally be expected to treat problems such as major limb reconstruction, spinal deformity and neuromuscular disease.

The DGH would act as the spoke and should have a paediatric ward and recovery zone. The hub and spoke(s) would interact. Speciality clinicians would either visit the DGH or surgeons could operate in the tertiary centre. Arrangements for the treatment of complex cases would be discussed at local level. Elective surgery is provided by consultant orthopaedic surgeons in DGHs with an interest in paediatrics and in tertiary centres with dedicated paediatric orthopaedic surgeons.

6.4 Ophthalmology

Approximately 90% of the paediatric ophthalmic²⁸ workload comprises the investigation and treatment of amblyopia ("lazy eye"), strabismus (squint), and nasolacrimal duct obstruction and

²⁷ <http://www.emsenatescn.nhs.uk/strategic-clinical-networks/maternity-and-childrens/east-midlands-general-paediatric-surgery-network/>

²⁸ <http://www.yhscg.nhs.uk/SSNDS-Version-3/23%20Specialised%20Services%20for%20Children.pdf>

much of the day to day management of these conditions is undertaken in local hospitals on a day case basis.

Consultant ophthalmologists who have undertaken core professional training and are on the specialist register carry out much of the hospital-based care of children with eye disease. Most units will contain one ophthalmologist with sub-specialty training in paediatric ophthalmology and strabismus and who will act as the lead clinician for children within the unit.

Serious visual loss in childhood is uncommon, with 6 of every 10,000 children born in the UK each year becoming severely visually impaired or blind by their 16th birthday.²⁹ Specialist tertiary facilities and access to other specialised paediatric services (paediatric anaesthesia) are required managing these patients.

6.5 Oral and maxillofacial surgery

Oral and maxillofacial surgery is a major provider of paediatric services for children requiring surgery involving the mouth, face, head and neck. The majority of procedures are undertaken as elective day cases in otherwise healthy children in DGHs and largely comprise routine dento-alveolar surgery. A proportion of more complex cases requiring hospital admission and overnight stay including orthognathic (facial deformity) surgery are also routinely undertaken in this setting.

Emergency care in children forms approximately 20–25% of all maxillofacial emergency admissions and usually occurs in children without significant co-morbidity. The majority of admissions involve facial lacerations, dog bites, fractures and orofacial infection and are managed in the DGH.

Complex maxillofacial paediatric surgery is usually undertaken in specialist centres following tertiary referral. This includes craniofacial deformity, cleft lip and palate, and paediatric head and neck oncology. Children with significant co-morbidity require referral to specialist centres where appropriate specialist paediatric services are available.

6.6 Otorhinolaryngology

The majority of ENT surgery cases are performed as day cases on healthy children. The routine elective case load includes minor ear procedures, tonsillectomy and adenoidectomy. The majority of ENT surgeons undertaking routine, elective and emergency ENT practice will have a workload more than sufficient to maintain clinical competence.

Most ENT emergencies also occur in children without other problems and are a small proportion of the total workload. Emergency work includes the management of foreign bodies in the ear, nose and throat, infections secondary to ear and sinonasal disease, head and neck abscesses and the arrest of bleeding following adenotonsillar surgery.

Provision of care

Most ENT surgeons are involved in general paediatric otorhinolaryngology, with very few purely paediatric ENT surgeons in the UK. It is recommended by the RCS that ENT routine elective surgery should continue in DGHs however children with general ENT conditions requiring emergency admission should only be admitted to units where both on-site ENT

²⁹ Children's Surgical forum Surgery for Children: Delivering a First Class Service RCS 2007

and acute paediatric services are available. Some less urgent non-elective “emergencies” (for example, foreign body in the ear) may be managed in a routine outpatient clinic or on the next available operating session.

At present most specialist centres generally have only one or two paediatric otorhinolaryngologists, making a 24-hour emergency airway service difficult to maintain, this is a particular issue in the WTP footprint.

7.0 MONITORING ACTIVITY AND OUTCOMES

It is recognised that simply measuring mortality for GPS alone is not an indicator of quality outcomes, and a networked approach looking across a number of outcome indicators will provide commissioners with a more holistic measure of assurance regarding the continued safety and quality of GPS provision.

The East Midlands GPS Commissioning Framework proposes the following clinical outcomes and activity measures³⁰:

| General Performance Measures | |
|---|----------|
| Elective Care | Comments |
| Number of day case elective procedures performed per consultant on children. | |
| Number of cancelled children’s operations per consultant | |
| 28 day readmission rates | |
| Number of unplanned overnight admissions following day case surgery | |
| Number of unplanned admissions to a paediatric critical care unit (L2 or L3) | |
| Number of near critical incidents and SUI’s reported | |
| Number of never events | |
| Number of written complaints | |
| Emergency Care | Comments |
| Number of transfers | |
| a) Performed by Embrace | |

³⁰ <http://www.emsenatescn.nhs.uk/strategic-clinical-networks/maternity-and-childrens/east-midlands-general-paediatric-surgery-network/>

| | |
|---|--|
| b) Performed by local team | |
| Destination of the child a) Tertiary provider b) Hub provider | |
| 28 day mortality | |
| 28 day readmission | |
| Number of near critical incidents and SUI's reported | |
| Number of never events | |
| Number of written complaints | |
| Sub-speciality specific – Outcome \Measures | |
| General paediatric surgery | |
| Age at orchidopexy | |
| Re-do orchidopexy | |
| Testicular loss following | |
| Length of stay for appendicectomy | |
| Orthopaedics | |
| Supracondylar fractures with vascular compromise – time taken from decision to transfer to transfer | |
| ENT | |
| Numbers of secondary post tonsillectomy bleed. | |

8.0 AUDIT

Children's Surgery and anaesthesia is included routinely in multi-disciplinary departmental audit and there is a mechanism to learn from incidents and complaints, which should incorporate:

- a) a method to regularly analyse/review
- b) major complications, including deaths following discharge from hospital ⁱ
- c) Outcomes
- d) Critical and untoward incidents reviews of perioperative

APPENDIX

Figure 1 NON-SPECIALISED EMERGENCY SURGICAL PATHWAYS

Figure 2 Schematic diagram of pathway illustrating component parts

FIGURE 1

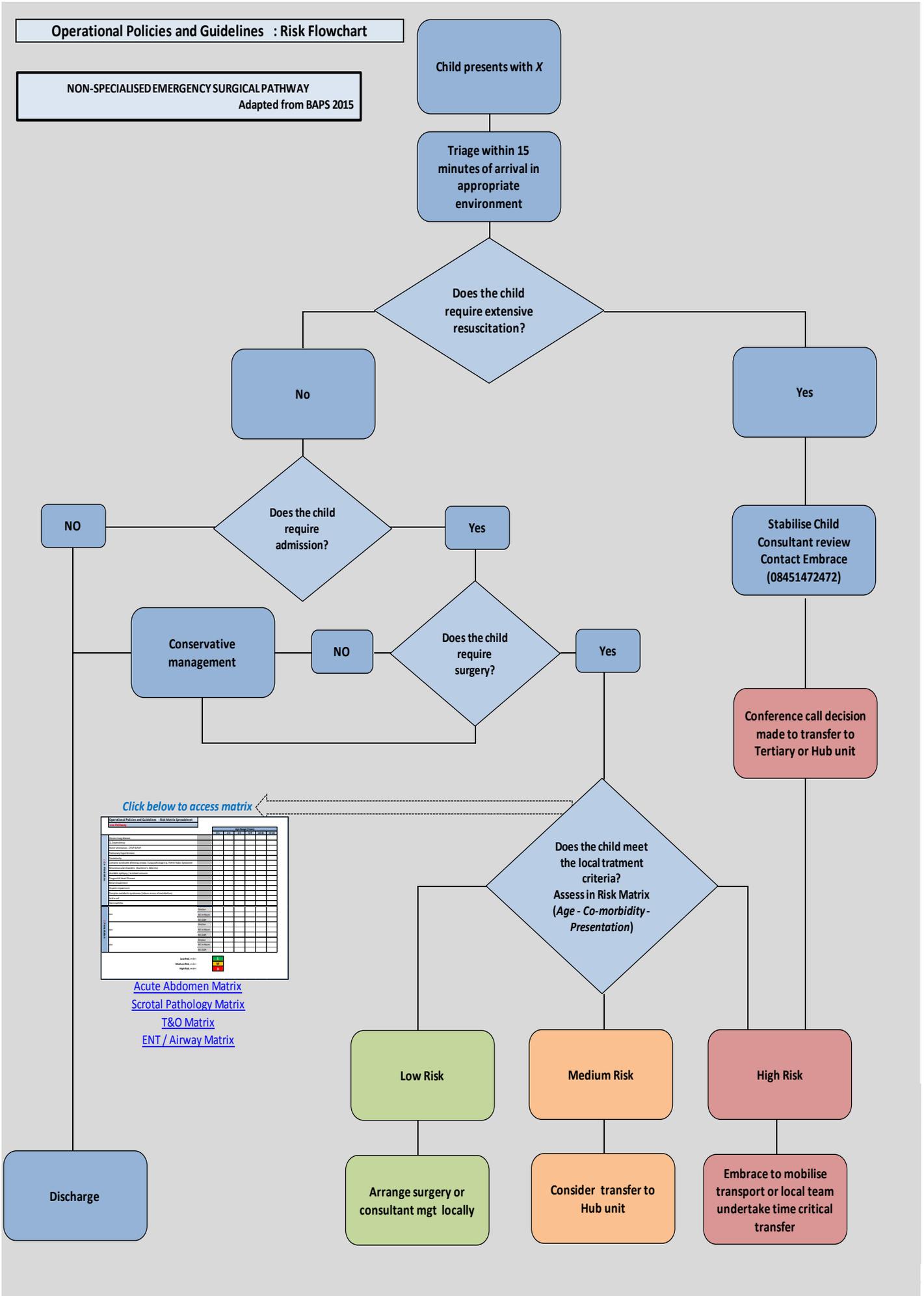


FIGURE 2:

