ROYAL MANCHESTER CHILDREN’S HOSPITAL

Theatres & Anaesthesia

Clinical Service Unit (CSU)

Paediatric Theatre

Student Induction Pack

Name: ......................................................................................

Start Date: ..................................................................................

Mentor’s Name............................................................................
Theatre Philosophy of Care

Central Manchester Foundation Trust has a vision to be recognised as

‘the leading healthcare provider in the NHS excelling in quality, safety, patient experience, research, innovation and teaching, dedicated to improving health’ (CMFT Strategic Plan 2014/15).

We understand each patient is an individual with differing psychological, social and spiritual needs and we recognise hospitalisation and surgical intervention is a frightening experience for the child and their family.

Our aim is to minimise the negative effect of hospitalisation to provide individual care by our team on arrival into theatre.

As providers of Holistic Family centred care we encourage parents to visit theatre with their children prior to admission. Parental presence pre-operatively in the anaesthetic room and recovery suite post-operatively is actively encouraged.

All aspects of care within theatre originate from the Association of Perioperative Practice (AFPP) which forms the basis of our guidelines.

All levels of staff are encouraged to undertake study within theatre and develop an evidence based culture.

Students from all disciplines are welcomed into the department.

This statement of our philosophy, which accepts Action for Children Standards (the NSF guidelines), United Nations Declaration of the Rights of the Child and the Children’s Hospital Philosophy all combine to provide a solid foundation of care within theatre.

We will continually re-evaluate this philosophy to meet the needs of the child in today’s society.
Welcome to Paediatric Theatre

- Hello, my name is Zoe Healy, I am your Clinical Educator for Paediatric Theatres:
  
  o Tel: 0161 901 5548
  
  o Email: zoe.healy@cmft.nhs.uk

- I share an office with the Theatre Lead Karen Potts, which is situated opposite the changing rooms, please come and see me if you have any issues/problems you need to discuss.

- We currently have eight team leaders:
  
  - Thomas Muldoon
  - Gillian Slater
  - Nigel Garbutt
  - Teresa Chun Cao
  - Ian Douglas-Brown
  - Michael Kenealy
  - Ross McAllister
  - Andrew Nevins

- The team leaders wear maroon scrubs when they are coordinating. They are responsible for the day to day allocation of staff to theatres. There is an allocation board near the coordinators station, which lists all staff on duty for that day.

- This is a very large department you are required to sign in and out of the student file (purple file kept at reception) on a daily basis. This system is monitored so please sign in and out at the correct time.
Orientation

On the first morning of your placement you will be given a tour of the department, and introduced to staff and your mentor. This orientation will cover:

- **Sickness and absence.** If sick you should inform the Clinical Educator as early in the day as possible on **0161 901 1275**. You must take the name of the person who you reported your sickness to if it is not the Clinical Educator. You should also inform the University. When you are fit to resume work please ring theatres to inform us or days off will count as sick days as per university policy.

- **Fire Policy.** You will be shown fire exits, extinguishers etc. The Trust Fire Policy is available to read and a copy of the fire plan is enclosed.

- **Moving & Handling.** Even moving small children may pose a risk. Theatre moving from trolley to theatre table involves the use of a Pat slide. Please show your clinical teaching in this area before moving patients.

- **Uniform.** Theatre wear is provided. A plain wedding ring and one pair of plain stud earrings are permitted. False or acrylic nails are not allowed. Hair should be tied back if shoulder length and makeup should be minimal. Students must wear white theatre hats to denote their supernumerary status.

- **Infection Control.** The infection control policy is available to read. If leaving the department you must change into your own outdoor clothes. Hand washing is essential and is regularly audited.

- **Security.** Please wear your name badge at all times. There are lockers available in the changing room. You are reminded that you are responsible for your own belongings. **NO** mobile phones are allowed in theatre.
• **No Smoking Policy.** The Trust discourages smoking. You must change into your own clothes when you leave the hospital to smoke. This time is included in your break.

• **Meal breaks.** Meal breaks are 30 minutes long and you can use this time as you wish, however you must get changed before leaving the department. The staff restaurant is open 24 hours a day, providing hot food during meal times and cold snacks are available at all other times.

• **Hours of duty.** You will work 37.5 hours over four days. You can work early, late or night shifts – please discuss this with your mentor.

  - **Early Shift:** 08.00-18.00
  - **Late:** 12.00-21.30
  - **Night Shift:** 21.00-08.30

• **Respect.** As a teaching hospital the department often has visiting Surgeons as well as Consultant Surgeons, Consultant Anaesthetists, Registrars – both surgical and anaesthetics, SHO’s, Radiographers, staff and student nurses and student ODP’s. Please address these people appropriately – respecting their position.

• **Policy & Procedures.** The Trust has developed policies and procedures to ensure uniformity in practice. These are located in various areas of theatre and cover:
  - Infection Control
  - Blood Policy
  - Health & Safety
  - Clinical guidelines
  - IV Policy
  - Intrathecal drugs and Bone Marrow Harvest
  - Drug Policy
  - Resuscitation
  - Human Resources Policy
  - Equality & Diversity Policy
University Contact Details for Students:

David Lawson, Practice Placement Facilitator: Edge Hill University: 01695657145
Sharon Green, Practice Education Facilitator for AHP: 0161 276 4372
Denise Owens, University Link Lecturer: Pan Manchester University: 0161 295 2749
Kirsty Walsh, Practice Education Facilitator for RMCH: 0161 901 1854
Emma Steeles, Operating Department Practice Education Facilitator: 
**Mon-Wed** 0161 701 2156/**Thu-Fri** 0161 276 4075

Spoke Placement Contacts:

We offer a variety of spoke placements within theatre which include:

Caroline Williams: NICU: 66379
Liz Jemmet: PICU: 18059
Dot Duckworth: Pain Team: 15626
Medicines Children’s Research Network: 16921

Please speak to Clinical Educators before booking spokes so that we can ensure that all students receive equal opportunity to spoke to different departments.
Introduction

The RMCH site has nine operating theatres and a Minor Procedures Unit (MPU), there are also four shelled theatres giving us the potential to open to a maximum of thirteen theatres.

The department undertakes both minor and major procedures in the following specialities:

- ENT
- General surgery
- Genitourinary
- Spinal
- Dental
- Haematology
- Nephrology (including kidney transplants)
- Neurosurgery
- Orthopaedics
- Plastic Surgery and Burns
- Oral surgery and Maxillofacial
- Endoscopy
- Urology
- Rheumatology
- Medical investigations (CT/Bronchoscopy)

There is a recovery area within the department which provides immediate post operative care for up to twenty-one patients. Walk in Walk Out (WiWO) lists such as dental; facilitate a 2 \textsuperscript{nd} stage recovery and discharge home service.

Patients also undergo anaesthesia in:

X-Ray (cardiac catheterisation, angiograms, etc.).
Computer Tomography (C.T. Scans)
Magnetic Resonance Imaging (MRI)
Oncology Clinic – Ward 84.
The theatres are served by wards:

**Ward 75** – Secondary Medical Ward

**Ward 76** – Elective Treatment Centre, which is divided into three areas, Day Case, Short Stay and Medical Investigations.

**Ward 77** – Nephrology, Urology, Cleft Lip and Palate, Plastic Surgery, Complex ENT and Dental/Max Fax, General Surgery.

**Ward 78** – Trauma and Orthopaedics, Spinal Surgery, Neurosurgery and Neurology.

**PICU** - Paediatric Intensive Care Unit (Ward 80)

**PHDU** - Paediatric High Dependency Unit (Ward 82)

**Ward 81** – Burns.

**Ward 83** – Nesta Wells unit and Transitional Care.

**Ward 84** – Haematology, Oncology including Bone Marrow Transplant Unit.

**Ward 85** – Tertiary Medical, Endocrine, Rheumatology, Cardiology, Metabolic, Cystic Fibrosis/Respiratory conditions.

**NICU** - Neonatal Intensive Care Unit (Ward 68)
**Student Competencies**

During your placement your mentor and other practitioners will help you to work towards achieving the competencies required for Children’s Nurses and Trainee Operating Department Practitioners.

**Care Management**

- Learn to prioritise need for care using the Manchester Early Warning Score (ManChEWS).
- Develop a wide range of clinical skills including medication administration, drug calculations, monitoring observations pre and post operatively, fluid balance, wound care, ANTT.

**Communication**

- Further develop verbal/non verbal skills i.e. listening to children and parents, observing non-verbal interactions between staff.
- Engage in therapeutic relationships.
- Assist with play and distraction.
- Contribute to written and IT based documentation.

**Promoting Health**

- Contribute to the education of families about health promotion e.g. pain relief, wound care.
- Hand-washing, promoting good practice.

**Safeguarding Children**

- Become familiar with the policies for safeguarding children and develop your knowledge/skills regarding how to recognise vulnerable families and children in need of protection.
Multi-Professional Working

★ Contribute to working relationships between members of the MDT.
★ You will have the opportunity to complete spokes in different specialities

Development of Self and Others

★ You will have the opportunity to shadow nurses and doctors to observe a variety of procedures.
★ Opportunity to learn more about paediatric surgery pre, intra and post operatively.

Research & Evidence Based Practice

★ You will become familiar with evidence based practice used in theatres.
★ You will have the opportunity to complete a research spoke.

Health and Safety

★ Participate in infection control policies.
★ Contribute to the maintenance of a safe environment.
★ Adhere to manual handling and all health and safety policies.

Equality Diversity and rights

★ Discuss and practice care with consideration of children’s rights and issues regarding confidentiality and consent.
★ Observe how cultural differences influence care management i.e. use of interpreters and accessing prayer/quiet room facilities.
Theatre Areas of Work

There are three areas of theatre work – **Anaesthetics**, **Surgery** and **Recovery**. Most staff within the department holds a primary and secondary skill. This ensures a multi-disciplined team works together to provide a safe and caring environment for both children and parents. We strive to ensure that protocols and policies that you observe during your placement are evidenced based.

Whilst in theatre you will have a **team approach to mentoring** to give a balanced view of the total experience. You will be allocated a **Primary Mentor** (responsible for all paperwork). It is important that you stay with your allocated practitioner or discuss any moving with your mentor. In each area an experienced practitioner will support you. You may not be working with your Mentor on a daily basis but they are present in the department if you have any questions. Your mentor will complete all necessary paperwork at the appropriate time and ensure that you have the opportunity to plan and achieve relevant outcomes. A communication tool will be used for giving feedback to your primary mentor.

Parents are actively encouraged in the anaesthetic room (usually one parent only) at the discretion of the anaesthetist. A parent is allowed to stay with their child until the induction of anaesthesia has taken place. Sometimes children are induced whilst sitting on a parent’s knee, and within reason we grant any request by the parent as to how we induce anaesthesia. We aim to make the visit of patient and parent to our theatre a safe and pleasant experience.

After surgery the patient is transferred to Recovery, where a qualified nurse or operating department practitioner (ODP) will care for them. As soon as the patient is awake and stable mum or dad is invited to come to Recovery until the child is ready for discharge to the ward. It is true that our patients spend most of the time they are with us anaesthetised, nevertheless we still care for and respect every patient.
Waiting Area/Aneesthetic room

We receive patients in the waiting area and anaesthetic room and it is important that we gain the confidence of both patient and parent, so during this time when documentation is checked, staff members are expected to act in a professional, pleasant and caring manner. To ensure a safe and skilled anaesthetic delivery anaesthetic practitioners must work closely with the anaesthetist.

Surgical procedure

Once anaesthesia has been safely delivered the patient is transferred to theatre onto the operating table and positioned and prepared for surgery. The “Scrub” nurse is responsible for ensuring a safe surgery checklist is completed with the surgeon, they are provided with everything needed to perform the surgery whilst also ensuring a sterile field is maintained.

The “Circulating” staff provides additional equipment as well as recording data into a theatre register, and ORMIS computer system. This role involves safe transfer of specimens to the appropriate laboratory, disposal of clinical waste and checking of instruments and equipment used with the Scrub nurse.

Nurses and ODP’s in the theatre assist the anaesthetist in maintaining anaesthesia, analgesia, recording fluid balance and transfusions whilst ensuring all theatre documentation is completed.

Recovery

Once surgery is completed the patient is transferred to the Recovery room. The recovery nurse or ODP is responsible for maintaining a safe patent airway, monitoring vital signs, checking wound sites, assessing the patients pain level and if necessary administering analgesia. After complete recovery, the patient is discharged into the care of a ward nurse ensuring a concise handover is given completion of documentation and. In some circumstances the child is sent to the High Dependency Unit post-operatively and dependent on the type of surgery some patients are transferred directly to the Intensive Care Unit.
Confidentiality

As trainee professionals we expect you to observe all aspects of client confidentiality. All people must be treated equally and fairly, without discrimination because of race, gender, disability or religion.

Evidence of learning

You are expected to complete the enclosed workbook which will then form part of your portfolio and it will enhance your learning and understanding of the theatre process. You will be able to use this as evidence if you need to complete an OSCE whilst on placement with us. If you need any help ask any member of staff you are working with or use the information in the department.

Study ideas

The nature of theatre means that we do have very busy periods and quiet periods but here are some ideas for self directed, delivered or facilitated learning.

- Drug calculations
- Common drugs and side effects
- Resuscitation trolley contents
- Difficult Intubation
- Defibrillator testing
- Basic surgical instruments
- Basic life support
- Fluid balance
The learning environment

We have a Clinical Educator in post that supports mentors and students and links to the university. The department has its own seminar room containing facilities for teaching such as a computer, projector and flip chart. There is an excellent library onsite with a range of articles and books. Internet access is available in the department for learning when appropriate. There is a student board outside the female changing rooms.

We have a shared drive which contains various presentations, videos, articles and standard operating procedures. This can be accessed on any computer.

Students will also have access to a computer located within the Maintenance Room, if needed for research. This computer is shared with the Band 6 team.

There is a communication meeting in the main coffee room at 08.00am every morning to update staff on issues for the day. There will be informal and formal teaching sessions.

There are opportunities to work with other professionals and departments who input into the care of children in theatre. Visits can be arranged as a ‘spoke placement’. These may include spokes to Ward 76 Short Stay Ward, Pain Team, Research team, PICU/NICU, St Mary’s Theatre, and Pre-admissions Clinic.

To help you to work towards appropriate skills whilst in theatres we have provided this student development pack.

A communication tool for feedback is contained within this pack, more copies are available please ask the clinical educator.
Students are expected to engage in many aspects of theatre practice. Throughout your time with us you will never be expected to work alone and will be supervised by a qualified member of staff at all times. There may be times that you find particularly stressful during your allocation, so please let the staff working with you know how you feel so that we can offer support. For more information speak to your mentor or a member of the education team.

The student off duty is allocated by the Clinical Educator. You will be working with your mentor and following their shift pattern as much as possible. Any off duty requests need to be discussed with the Clinical Educator. The student off duty can be found on the student board.

**What to do at the start of your shift**

When you start you shift you will need to go to the allocation board near the co-ordinators station. This board has the theatre number e.g. 21 and the anaesthetic, scrub and circulating practitioners for the morning and afternoon. If you have been allocated to scrub or anaesthetics you need to locate your mentor on the board. If you mentor is off sick or has changed their shift see either the Team Leader or Clinical Educator and they will reallocate you.

We hope you will find your time in theatres educational, enjoyable and informative. If you feel that there is any way that you feel we can enhance the learning environment for you please let us know when you complete your placement feedback form.
Important Points to Remember:

<table>
<thead>
<tr>
<th>Documentation</th>
<th>Internet/ Social Media</th>
<th>Sharps/ COSHH</th>
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<tbody>
<tr>
<td>Timesheets</td>
<td>Report issues etc.</td>
<td>Uniform Policy</td>
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<tr>
<td>Hand-washing</td>
<td>Please wear White Hats</td>
<td>Sickness/ Absence Policy</td>
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<td>Policies</td>
<td>Fire</td>
<td>Behaviour in the Clinical Area</td>
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<td>Moving and Handling</td>
<td>Direct Supervision</td>
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</table>

This is your Learning Experience!

Mentor or Allocated person needs to know where you are.

Please ensure your timesheet is signed at the end of each shift/week.

**STUDY, STUDY, STUDY!!!!!**
### Anaesthetics

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>Why do we check theatre lists? What are we checking for?</td>
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<tr>
<td>Why is a child’s weight important?</td>
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<tr>
<td>Who checks the anaesthetic machine? What are they checking for?</td>
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<td>Who is allowed to check controlled drugs? (see Drug policy)</td>
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<td>What questions do we ask when the child enters the anaesthetic room and why?</td>
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<td>Why is site marking so important?</td>
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<td>Who can sign the consent form?</td>
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<td>What is available to distract the child?</td>
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<td>What do ET and LMA stand for?</td>
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<td>When is an ET used and what aids are available to the anaesthetist?</td>
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<tr>
<td>What pain relief is given in the anaesthetic room?</td>
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<td>Why do we give IV fluids and what do we use?</td>
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<td>What moving and handling aids are available to use?</td>
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<tr>
<td>How is equipment decontaminated after use?</td>
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</table>

Use the attached sheet to indicate what procedures and techniques you have observed, been taught and have performed under supervision. This will form part of your learning evidence.

You should record all learning and ask the staff you are working with to sign and date the relevant box. If you are using this evidence for an OSCE you need to record how long you spent on each activity.
<table>
<thead>
<tr>
<th>Skill</th>
<th>Discuss/taught</th>
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<td>Why is it important to check availability of equipment?</td>
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<td>What checks are made prior to opening the tray/equipment?</td>
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<td>Why is the traceability of the trays so important?</td>
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<td>Why is important to wear a visor, mask, gown and gloves?</td>
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<td>What are the seven stages of hand-washing?</td>
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<td>How long should it take to wash your hands?</td>
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<td>What can you touch once you have your gown and gloves on?</td>
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<td>Why is time out so important?</td>
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<td>What measures are used to prevent pressure problems during surgery?</td>
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<td>What moving and handling equipment is available to use?</td>
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<td>What additional interventions ensure patient safety whilst surgery is</td>
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<td>carried out?</td>
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<td>Why are swab and instrument counts important and when should they be</td>
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<td>What different skin preparations are used and why?</td>
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<td>What different sutures are used – and why?</td>
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<td>Name three different dressing types</td>
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<td>What is the difference between monopolar and bipolar diathermy?</td>
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<td>Why is it important to clean the patient prior to applying dressings and exiting theatres?</td>
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</table>
What daily checks are performed prior to a patient entering recovery?

Why are these checks important?

What monitoring equipment is available in each bay?

What personal and protective equipment is available for staff?

What equipment should come into recovery with the patient?

What information is given during the handover from the anaesthetist?

How is the patient assessed to ensure they are breathing?

Who removes the ET and the LMA/Guedal airways?

How do you respond to a patient vomiting when they are – unconscious or awake?

How do you respond if the patient has a problem with breathing?

What pain assessment tools are available in recovery?
How do we respond to a patient in pain? What analgesia is available in recovery?

Observe the making of morphine infusions – why do we need a pain manual and pain team?

What effects do opioids have on children?

What checks are made prior to the child being discharged?

Why is fluid balance important?

What is the discharge criterion for children?

What information needs to be given to the ward nurse when the patient is discharged to the ward?

How is the bay prepared for the next patient?

Use the attached sheet to indicate what procedures and techniques you have observed, been taught and have performed under supervision. This will form part of your learning evidence.

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GLOSSARY OF OPERATIONS

GENERAL

PYLOROMYOTOMY
Usually in babies about 6 – 8 weeks old, they suffer with projectile vomiting as the pyloric orifice at the outlet of the stomach narrows causing an obstruction which blocks the flow of food into the small intestine. An incision of the pylorus is made usually via the umbilicus to open the muscle.

ANOPLASTY
The surgical making of an anus, in severe stenosis or absence of an anal opening (imperforate anus).

ORCHIDOPEXY
An undescended testicle is brought down into scrotum and secured with a suture.

HYDROCELE
Drainage of a swelling round the testicle due to an accumulation of fluid.

DUHAMELS PULL THROUGH
Hirschsprungs Disease, the congenital absence of autonomic ganglia in the smooth muscle wall of the colon resulting in poor or absent peristalsis in the involved segment of the colon causing mega colon. The portion of the bowel is resected and a temporary colostomy is formed.

RECTAL BIOPSY
Biopsy taken to rule out Hirschsprung Disease in children suffering with constipation.

GASTROCESIS
This is a congenital defect characterised by incomplete closure of the abdominal wall with some of the internal organs outside the body. This is sometimes seen on ultrasound before birth and needs surgical intervention immediately after birth.
NISSEN FUNDOPPLICATION
The treatment for gastric reflux. The stomach is hitched around the oesophagus to reduce reflux.

INSERTION OF GASTROSTOMY TUBE/BUTTON
The surgical insertion of a feeding tube directly into the stomach, to aid feeding or giving medicines.

TRACHEAL OESPHAGEAL FISTULA (TOF)
Surgical repair of the connection between the trachea and oesophagus. Diagnosis is usually made shortly after birth and corrected immediately.

INTUSSUSCEPTION
A condition in which part of the intestine becomes pushed into itself. It occurs mainly in children at the ileocaecal junction causing intestinal obstruction which requires prompt surgical intervention.

UROLOGY

CYSTOPLASTY
Operation to increase the size of the bladder using a length of the Ileum or Colon as a patch.

HYPOSPADIAS
A congenital defect in which the urinary meatus is on the underside of the penis. These repairs may be called Magpi, Matthieu or Duckett after the surgeons who developed this particular repair.

EPISPADIAS
A congenital defect in which the urinary meatus is on the upper side of the penis.

REIMPLANTATION OF URETERS
Performed for the maldevelopment of the ureteric orifices leading into the bladder. When the bladder contracts urine flow back (reflux) into the ureters and kidneys (hydronephrosis) causing disease and infection.
**CYSTOMETRY LINES**
Surgical insertion of a special line for urodynamic studies of the bladder. Dye is inserted and screened via X-Ray to monitor bladder function.

**PYELOPLASTY**
The ureters or renal pelvis of the kidney may be dilated due to repeated infections or obstructions. Removal of the obstruction may allow the ureter to return to normal.

Some urological operations are now performed using laparoscopic instruments connected to a television screen to enable the surgeon to perform minimal invasive surgery, which has a much faster recovery time and a reduced hospital stay.

**EAR, NOSE AND THROAT**

**MYRINGOTOMY**
Incision into the tympanic membrane in the ear to drain debris from the middle ear, and to allow insertion of GROMMETS.

**MYRINGOPLASTY**
The surgical repair of the tympanic membrane in the ear.

**ADENOIDECTOMY**
Surgical removal of the adenoids.

**TONSILECTOMY**
Surgical removal of the tonsils. This may also be done at the same time as removal of the adenoids, and is then called an ADENOTONSILECTOMY.

**MASTOIDECTOMY**
The surgical removal of diseased bone and drainage of debris from the mastoid area.
BONE ANCHORED HEARING AID (BAHA)
The surgical implantation of a titanium abutment which is drilled into bone behind the ear. This can then be fitted with a hearing aid or auricular prosthesis.

PINNAPLASTY
The surgical correction of prominent ears to allow them to lie flat against the head.

TRACHEOSTOMY
The surgical formation of an airway directly into the trachea. This operation is sometimes necessary from birth to allow adequate respiration but can be removed as the child’s condition improves. It is also used for acute upper airway problems which will never resolve.

COCHLEAR IMPLANT
The surgical insertion of an electronic medical device, which replaces the function of the damaged inner ear. Cochlear implants do the work of damaged parts of the inner ear (cochlea) to provide sound signals to the brain.

NEUROSURGERY

HYDROCEPHALUS
This condition produces an enlargement of the skull due to abnormal collection of cerebrospinal fluid around or in the ventricles. This condition is corrected by insertion of either a VENTRICULAR PERITONEAL SHUNT (VP SHUNT) or ENDOSCOPIC THIRD VENTRICULOCESTOMY and insertion of an External Ventricular Drain (EVD).

MENINGOCELE REPAIR (SPINA BIFIDA)
A congenital defect of non-union of one or more vertebral arches allowing protrusion of the meninges and possibly their contents, appearing as a cyst filled with cerebrospinal fluid.
CRANIOTOMIES
Surgical intervention to remove various tumours located in the brain.

CRANIOSYNOSTOSIS
Surgical correction and reconstruction of the skull to create a more normal skull shape.

SPINAL SURGERY
Complex surgery involving the insertion of titanium rods and screws to correct spinal scoliosis (Curvature of the spine). Early correction includes the application of plaster jackets to improve or delay deterioration in the child’s condition.

ORTHOPAEDIC SURGERY

CONGENITAL HIP DISLOCATION
Surgical intervention including various osteotomies and fixation with screws and plates, including immobilisation in frog plaster.

DEFORMITIES IN TALIPES
Surgical interventions including tendon transfer, osteotomy and plaster to correct the various forms of TALIPES.

ARTHROGRAM
An X-Ray film taken of a joint which has been injected with radio opaque substance to outline the bone and cartilage.

ESCHAROTOMY
Incision into skin layers to allow swelling of underlying tissues without causing further damage, usually following burn injuries.

FASCIOTOMY
An incision through the skin and into the connective tissue surrounding the muscle where swelling post fracture causes pressure in the muscle compartment.
SKIN & PLASTIC SURGERY

SPLIT SKIN GRAFT
A partial thickness of healthy skin tissue to be transplanted to a debrided area of full thickness burn or scald.

CLEFT LIP & PALATE REPAIR
Surgical correction of palate deformities and plastic reconstruction of cleft lip.
**ET Tubes**

**Oral.**
They are made of plastic and have a gentle curve to ease insertion. Adult tubes have a cuff to provide an airtight fit.

**Ring Adair Elwyn (RAE).**
RAE tubes have a preformed shape to fit the mouth or nose without kinking. They have a bend located just as the tube emerges so the tube connections to the breathing system are at the level of chin or forehead and they do not interfere with surgical access.

**Reinforced (armoured).**
Reinforced tubes are plastic or silicone. They are thicker and contain a spiral of metal wire or tough nylon. This prevent kinking or occlusion of the tube when the head or neck rotate or flexes during surgery. Anaesthetic practitioners **CAN NOT** cut this tube so there can be a risk a bronchial intubation. There are markers just above the cuff to advise the anaesthetist of the correct position of the tube.

**Laser.**
Laser tubes are used for laser surgery on the larynx or trachea. Laser tubes can withstand the laser beam. The tube has two cuffs to inflate and the anaesthetic practitioner fills these with normal saline instead of air to prevent the hazard of fire from the laser beam. The Anaesthetic practitioner covers the patient’s eyes with damp gauze swabs and padding during the surgical procedure.

**Endobronchial or Double Lumen tubes.**
During thoracic surgery there is a need to deflate one lung. This offers the surgeon easier and better surgical access, either a right hand or left hand tube is selected to allow deflation of one lung whilst the patient is ventilated using the other lung.
To calculate the size of tube needed:

The size
(age) + 4
(4)

Length
(age) + 14
(2)

Over 2 years old use the formula above.

<table>
<thead>
<tr>
<th>Preterm</th>
<th>Size 2.5</th>
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<tbody>
<tr>
<td>Birth</td>
<td>Size 3.0-3.5</td>
</tr>
<tr>
<td>6 Months</td>
<td>Size 4.0</td>
</tr>
<tr>
<td>1 Year</td>
<td>Size 4.5</td>
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</tbody>
</table>

LMA

<table>
<thead>
<tr>
<th>Weight</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>Up to 5 kg</td>
<td>Size 1</td>
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<tr>
<td>5 – 10kg</td>
<td>Size 1.5</td>
</tr>
<tr>
<td>10 – 20kg</td>
<td>Size 2</td>
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<tr>
<td>20 – 30kg</td>
<td>Size 2.5</td>
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<tr>
<td>30 – 50kg</td>
<td>Size 3</td>
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<tr>
<td>50- 70kg</td>
<td>Size 4</td>
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<tr>
<td>70 – 100kg</td>
<td>Size 5</td>
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</table>

Links to policies and procedure that are used within the theatre department at RMCH

- Trust peri-operative swab, instrument and needle count
- ANTTS guidelines
- ANTTS Policy
- Observation Policy
  [http://ac.staff.cmft.nhs.uk/media/80634/observation_policy_final_nov_2012_changed_review_date.pdf](http://ac.staff.cmft.nhs.uk/media/80634/observation_policy_final_nov_2012_changed_review_date.pdf)
- MANCHewS2 Policy
  [http://ac.staff.cmft.nhs.uk/media/243927/manchews_policy_2013_v3_final_-_ratified_dec_2013_1_.pdf](http://ac.staff.cmft.nhs.uk/media/243927/manchews_policy_2013_v3_final_-_ratified_dec_2013_1_.pdf)
- Safe Surgery/Procedures Safety Checklist Policy
- Hand Hygiene
  [http://staff.net.cmft.nhs.uk/Policies/Infection/OC2-2600-11-6-2014-09-17-27.pdf](http://staff.net.cmft.nhs.uk/Policies/Infection/OC2-2600-11-6-2014-09-17-27.pdf)

**Anaesthetic Department**

Paediatric Anaesthetic Department Intranet Page


Guidelines and protocols including:

- Analgesia for children having cleft lip and palate surgery
- Management of post-operative nausea and vomiting
- Treatment of severe local anaesthetic toxicity
- Adenotonsillectomy for obstructive sleep apnoea anaesthesia guidelines
- Anaesthesia for children with mediastinal mass
- Management of infants less than 6 months undergoing day case procedures
- Neuro embolisation
- Oral sedation guidelines
Pain

- Children’s Pain Team Intranet Page

http://cpmt.staffnet.cmft.nhs.uk/

Guidelines and protocols including:

- Analgesia for Infants
- Management of Epidurals and Local Anaesthetic Infusions
- Morphine Infusions/PCA Infusions
- Post-Operative Nausea and Vomiting in Children
Communication Tool
Communication Tool for Students and Staff Members

This tool is for staff members to utilise to communicate feedback to the student’s allocated mentor(s)

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Mentor(s) Name(s):</th>
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<tr>
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Date worked with student

Comments:

Staff Name and Signature

Student’s Signature

<table>
<thead>
<tr>
<th>Please indicate which best describes the student’s level of interest</th>
<th>Excellent</th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Communication skills</td>
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<tr>
<td>Professional attitude/ conduct</td>
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Drug Calculation Booklet
DRUG CALCULATIONS

Author – A Jackson RN (child)
FORWARD

The very words “DRUG CALCULATIONS” appear to inject feelings of fear and dread into the heart of any nurse, but like any clinical skill “practice makes perfect”.

This teaching pack will take you step-by-step through a number of formulations used on the ward when administrating medications, enabling you to practice addition, multiplication and long division in practical situations.

You will need access to a copy of the British National Formulary (BNF) to complete sections of this pack.

If you experience any difficulties with some of the mathematics needed to complete this workbook please ask any of the staff-nurses for support.

**Do Not Use A Calculator** whilst completing the exercises, the more you practice your maths the easier it becomes.
**Aims**

The aim of this teaching pack is to enable the student to utilise a number of formulations used on the ward when calculating and administrating treatment programmes.

**Objectives**

On completing this document the student will be able to:

- Demonstrate a competency in mathematics
- Convert a variety of weights
- Utilise the BNF to check the prescribing of medications

Also the student will be able to calculate:

- A child’s estimated weight
- Daily fluid requirements
- A variety of drug dosages
WEIGHT CONVERSIONS

Whilst calculating drug dosages the recommended dose may be quoted in a variety of weights.

Key
1 g = one gram
1 mg = one milligram
1 mcg = one microgram

As part of your role in calculating the correct dose for the patient, you will have to be able to convert the stated weight into the dosage weight on the drug to be administered.

Conversion rate

1 g = 1000 mg
1 mg = 1000 mcg

So to convert a weight in grammes into milligrammes, you must multiply the weight in grammes by 1000.

To convert milligrammes into grammes, you must divide the weight in milligrammes by 1000.

To multiply by 1000 the decimal place is moved to the left three places.
E.g. 1.2 g into mg

1.2 ⇒ 12 ⇒ 120 ⇒ 1200
one place two places three places

hence: 1.2 g = 1200 mg
To divide by 1000 the decimal place is moved to the right three places.
E.g. 150mcg into mg

\[
150 \rightarrow 15 \rightarrow 1.5 \rightarrow 0.15
\quad \text{one place two places three places}
\]

hence: 150mcg = 0.15mg

Convert the following weights:

- 750mg into g \quad \rightarrow \quad g
- 500mcg into mg \quad \rightarrow \quad mg
- 0.35g into mg \quad \rightarrow \quad mg
- 0.5mg into mcg \quad \rightarrow \quad mcg
- 775mcg into mg \quad \rightarrow \quad mg
- 0.05g into mg \quad \rightarrow \quad mg
- 950mg into g \quad \rightarrow \quad g
- 0.125g into mcg \quad \rightarrow \quad mcg
- 35mcg into g \quad \rightarrow \quad g
DAILY FLUID REQUIREMENTS

When a child is unable to tolerate oral intake of diet or fluids, due to their medical condition or pre- or post-operative instructions, they will be given an intra-venous infusion to replace oral input.

To calculate the daily fluid requirements of a child:

The child will receive 100mls of fluid per kg for the first 10kg of their weight.

Plus 50mls per kg for the next 10kg of their weight.

Plus 20mls per kg for every other kg of their weight.

E.g. the daily fluid requirement for a child of 27kg.

\[
\begin{align*}
100 \times 10 &= 1000\text{mls} & \text{(for the first 10kg)} \\
+50 \times 10 &= 500\text{mls} & \text{(for the next 10kg)} \\
+20 \times 7 &= 140\text{mls} & \text{(for the rest of the weight)} \\
\hline
&= 1640\text{mls} & \text{Daily fluid requirement}
\end{align*}
\]

Hence: A child of 27kg has a daily fluid requirement of 1640mls.

Once you have calculated the daily fluid requirement, you then have to calculate the hourly rate required to administer the fluids over 24 hours.

This is the infusion rate programmed into the IVAC used to give the fluids.

So to calculate the hourly infusion rate, you must divide the daily fluid requirement by 24.

E.g. \(1640 \div 24 = 68\text{ ml/hr}\)
Calculate the daily fluid requirement and hourly infusion rates for the following weights: (use the space below for your working out)

(i) For a child who weighs 39kg
   Daily fluid requirement = ____________ mls
   Given at ____________ ml/hr

(ii) For a child who weighs 17kg
     Daily fluid requirement = ____________ mls
     Given at ____________ ml/hr
DRUG DOSAGES

Whenever administering medications the dosage prescribed must be checked and compared with the suggested dosage in the British National Formulary (BNF) for the child’s age and weight.

The standard prescribed dosages for analgesia given on the ward are:

Paracetamol = 15mg per kg

Ibuprofen = 5mg per kg

Check in the BNF for the maximum recommended dose for Oromorph.

Oromorph = per kg

Calculate the dosages for paracetamol, ibuprofen and oromorph for the following children’s weights:

(i) For a child who weighs 16kg

Paracetamol = mg. Ibuprofen = mg. Oromorph mg

(ii) For a child who weighs 45kg

Paracetamol = mg. Ibuprofen = mg. Oromorph mg

(iii) For a child who weighs 85kg

Paracetamol = mg. Ibuprofen = mg. Oromorph mg

NB. Remember to check doses with the BNF.
**DRUG DOSAGES**

Most drugs are dissolved in a medium to make them easier to administer, so once the dosage has been calculated then you have to calculate the volume required to give the prescribed dose.

(i) A child is prescribed 400mg of paracetamol.

*Paracetamol is supplied as a suspension at 250mg in 5mls.*

i.e. every 5 ml of syrup contains 250 mg of paracetamol.
So to calculate the volume of syrup required to give 400mg of paracetamol, you must divide the prescribed dose by 250, then multiply the result by 5.

E.g. $\frac{400}{250} = 1.6$\hspace{1cm}1.6 \times 5 = 8

Hence: 8mls contains 400mg.

(ii) A child is prescribed 120mg of ibuprofen

*Ibuprofen is supplied as a suspension at 100mg in 5mls.*

i.e. every 5 ml of syrup contains 100 mg of ibuprofen.
So to calculate the volume of syrup required to give 120mg of ibuprofen, you must divide the prescribed dose by 100, then multiply the result by 5.

E.g. $\frac{120}{100} = 1.2$\hspace{1cm}1.2 \times 5 = 6

Hence: 6mls contains 120mg.
(iii) A child is prescribed 5mg of Oromorph

*Oromorph is supplied as a suspension at 2mg in 1ml.*
i.e. every 1 ml of syrup contains 2 mg of Oromorph.
So to calculate the volume of syrup required to give 5mg of Oromorph, you must divide the prescribed dose by 2.

E.g. 5 ÷ 2 = 2.5

Hence: 2.5mls contains 5mg.

**Calculate the volumes required to give the following doses:**

(i) 350mg of paracetamol = mls.

(ii) 280mg of ibuprofen = mls

(iii) 780mg of paracetamol = mls.

(iv) 75mg of ibuprofen = mls

(v) 80mg of paracetamol = mls.

(vi) 125mg of ibuprofen = mls

(vii) 550mg of paracetamol = mls.

(viii) 375mg of ibuprofen = mls.
ESTIMATING WEIGHTS

Following a trauma, obtaining a child’s weight could be extremely difficult, in these cases an estimation of the child’s weight is calculated from their age.

The formula for estimating a child’s weight is:

For 0-8 years of age \[ \Rightarrow (\text{AGE} + 4) \times 2 \]

Over 8 years of age \[ \Rightarrow \text{AGE} \times 3 \]

Calculate the estimated weights for the following children:

(i) a child who is 3 years old \[ = \text{kg (estimated)} \]

(ii) a child who is 7 years old \[ = \text{kg (estimated)} \]

(iii) a child who is 14 years old \[ = \text{kg (estimated)} \]

- Estimated weights are usually lower than the child’s actual weight.
MORPHINE INFUSIONS

It is common for children to be nursed post-operatively on a continuous infusion of Morphine Sulphate. This is given intravenously, diluted in 0.9% saline or 5% dextrose.

**DOSAGES**

Under the age of 6 months = 100 mcg per kg (0.1mg/kg) in 40mls of 0.9% Saline

Over 6 months of age = 200 mcg per kg (0.2mg/kg) in 40mls of 0.9% Saline

This solution is then administered at between 0-5mls/hr, the rate dependant on what is required to give the best analgesic cover.

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<tr>
<th>Rate</th>
<th>Under 6 months</th>
<th>Over 6 months</th>
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<tbody>
<tr>
<td>1 ml/hr</td>
<td>2.5 mcg/kg/hr</td>
<td>5 mcg/kg/hr</td>
</tr>
<tr>
<td>2 ml/hr</td>
<td>5 mcg/kg/hr</td>
<td>10 mcg/kg/hr</td>
</tr>
<tr>
<td>3 ml/hr</td>
<td>7.5 mcg/kg/hr</td>
<td>15 mcg/kg/hr</td>
</tr>
<tr>
<td>4 ml/hr</td>
<td>10 mcg/kg/hr</td>
<td>20 mcg/kg/hr</td>
</tr>
<tr>
<td>5 ml/hr</td>
<td>12.5 mcg/kg/hr</td>
<td>25 mcg/kg/hr</td>
</tr>
</tbody>
</table>

Dosages of over 25mcg/kg/hr (over 5mls/hr) may only be prescribed by a consultant anaesthetist.

(i) A child of 12 years of age weighing 43kg

To calculate the amount of morphine, in mg, that will be added to 40mls of 0.9% saline you need to multiply the child’s weight by 0.2 (E.g. 43 x 0.2mg = 8.6 mg)

Hence: 8.6mg in 40 ml of 0.9% saline
Morphine Sulphate comes in ampules of different strengths.
- 1 mg in 1 ml
- 10 mg in 1 ml
- 60 mg in 2 ml

E.G. If using an ampule of morphine sulphate at 10 mg in 1 ml:

To calculate the volume of Morphine Sulphate required to give 8.6 mg you must divide the dose by the concentration (i.e. 10 mg), then multiply the result by the volume it is contained in (i.e. 1 ml).

\[ 8.6 \div 10 \times 1 = 0.86 \]

Hence: 8.6 mg = 0.86 ml of 10 mg in 1 ml

Calculate the amount of morphine (in mg) to be added to 40 ml of 0.9% saline for the following children:

(i) A child who is 4 years old and weighs 19 kg

(ii) A child who is 7 years old and weighs 28 kg

(iii) A child who is 8 months old and weighs 11 kg

(iv) A child who is 4 months old and weighs 6 kg

(v) A child who is 15 old and weighs 63 kg
Calculate the volume of morphine required, for children (i), (ii), (iii) and (iv), if the ampules used were 10 mg in 1 ml.

(i)

(ii)

(iii)

(iv)

Calculate the volume of morphine required, for child (v), if the ampule used were 60 mg in 2 ml.

(v)
PUTTING IT ALL TOGETHER

For the following scenarios calculate:

- Estimated weight
- Dosages of Paracetamol, Ibuprofen and Oromorph
- Volume of Paracetamol, Ibuprofen and Oromorph
- Daily fluid requirement
- Hourly infusion rate

Scenario one

Michael is a 13 year old young man who has sustained a fractured left femur, following a fall from a roof. Michael is being kept nil by mouth until being taken to theatre for open reduction and internal fixation of his fractured femur.

Estimated weight = kg

Dosage of:

Paracetamol = mg mls
Ibuprofen = mg mls
Oromorph = mg mls

Daily fluid requirement = mls given at ml/hr
Scenario two

Abigail is a 4 year old young girl who has been admitted to the ward following a car accident. She has multiple injuries, including a compound fracture to her left tibia, closed fractures to her right tibia and fibula and superficial grazes to her legs, torso and face. The medical team is querying a head injury due to a reported loss of consciousness at the scene of the accident and consistent complaints of nausea.

Estimated weight = kg

Dosage of:
Paracetamol = mg  $\rightarrow$  mls
Ibuprofen = mg  $\rightarrow$  mls
Oromorph = mg  $\rightarrow$  mls

Daily fluid requirement = mls given at ml/hr

A compound fracture has a high risk of infection due to the bone piercing the skin. Because of this Abigail has been prescribed I.V. antibiotics.

Check in the BNF for the correct dose of Flucloxacillin for Abigail’s weight.

Dosage of:
Flucloxacillin = mg
Relevant Articles
Introduction

Welcome to the vision for children and young people’s nursing. The term children’s nurse is used broadly in this document to reflect all nurses responsible for the delivery of care to children and young people. It includes registered children’s nurses, specialist community public health nurses and general nurses working within children’s services. The vision underpins the Trust Nursing and Midwifery Strategy and also reflects local and national policy and inspectorate requirements.

It is a privilege to help and support children, young people and families during difficult times and our ambition is to achieve excellence by living our nursing values every day. We will focus on four inter-related priorities:

- Deliver a high quality patient and family experience
- Lead, develop and value the children and young people’s nursing workforce
- Ensure effective communication
- Create a positive culture

These priorities align to the six values and commitments set out in the corporate Nursing and Midwifery Strategy.
Our vision creates the opportunity to re-state the core values of children and young people’s nursing, to define our personal contribution and commitment and to develop a shared identity and sense of belonging. The accompanying corporate and divisional annual delivery plans will set out actions to engage with children, families and staff so that we can understand perceptions and experiences, to agree standards and expectations, then to empower patients and families through effective communication and partnership working and to empower nurses by developing and utilising their skills effectively.

We want our vision to support the creation of a positive organisational culture where all nurses are enabled to innovate in practice and feel valued for their contribution. We want to harness the unique contribution of children’s nurses to establish the Royal Manchester Children’s Hospital and Manchester Children’s Community Services as centres of excellence.

Developing our vision

Our vision has been developed by our children and young people’s nurses, children and families through a series of workshops and discussions.

We believe that:

- We are privileged to work with children, young people and families.
- We are proud to be a children’s nurse.
- We are passionate about our profession.
- We are purposeful about our role.

What do we want our children, young people and families to say about us?

Caring, kind, open, available, present, professional, easy to talk to, good listeners, gentle, supportive, trustworthy, friendly, presentable, responsive, approachable, clear communicator, reassuring, pleasant, polite, helpful, reliable, appropriate, patient, non-judgmental, respectful, involves me, fair, protective, special, motivated, empathetic, safe, honest, challenging when appropriate, understanding, informative, sense of humour, hard working, truthful, makes you feel important, smiling, always there, sensitive, skilled, considerate, passionate, pro-active committed, adaptable, discrete, experts, accessible, compassionate, knowledgeable, positive, fun loving, confidential, punctual, understandable, makes time for you, dedicated…

Our children, young people and families

Our children’s services provide community and hospital care to children and young people who live in the city as well as tertiary care to children and young people across the North West region and beyond. There are almost 116,000 children and young people living in the city (24% of the resident population) and this number is growing rapidly. The largest proportions of children live in Cheetham Hill, Moss Side, Longsight and Gorton South where over a fifth of the population is aged under 15 years. Almost 39% of Manchester’s children and young people have a Black and Minority Ethnic (BME) background. About
Deliver a high quality patient and family experience

Our aim
We want to work in partnership with children, young people and families to ensure that every child and family experience high quality nursing care.

Children and young people's nurses want to strive for the highest quality patient experience and outcome, achieved through the delivery of family-centred, evidence-based, responsive care.

Our principles
Quality is central to everything.
Feedback must be actively sought and learning used to continuously improve our care.

Unique contribution of children and young people's nursing
Children and young people's nurses have a privileged relationship with patients and families and are uniquely placed to influence the quality of the patient and family experience. Their skills in communication and negotiation with children, young people and families enable them to gain and use patient feedback to continuously improve care.

Lead, develop and value the children and young people's nursing workforce

Our aim
We want children and young people's nurses to be proud of their contribution to patient experience.
We want to harness and develop children and young people's nursing leadership at all levels to enable recruitment and retention of a highly skilled children and young people's nursing workforce who feel valued and have access to defined career pathways.

“Leadership is not a position, it is a choice”

(Steven Covey)

Ensure effective communication

Our aims
We want to develop a culture where open and transparent, two-way communication is embedded and everyone's views are listened to and valued.
We want children, young people and families to feel well informed about the hospital environment and about their care and to be active partners in decisions about their care. We want to continuously improve care by sharing lessons learnt and to celebrate successes and share excellent practice.

Our principles
Listening is at the heart of effective communication.
Children, young people and families must have access to the right information in the right format to enable them to make informed decisions about their care.

Unique contribution of children and young people's nursing
Children and young people’s nurses are skilled at acting as advocates by being translators and conduits, liaising between children, young people, families, and healthcare professionals.

As effective communicators children and young people’s nurses are uniquely placed to use all opportunities for communication to explain complex messages clearly and in ways that make sense for children, young people and their families.
"We were particularly impressed with the way so many different disciplines were able to come together and treat our son and provide assistance. He required help from haematology, ophthalmology, immunology, urology, neurology, infectious diseases, amongst others. Nothing was too much trouble and everyone was extremely patient with us, as parents, who obviously had a number of questions on a regular basis."

*Feedback from parents June 2012*

### Create a positive culture

**Our aim:**
We want to develop a distinct and readily identifiable organisational culture, which is congruent with our vision and professional beliefs of Privilege, Pride, Passion and Purpose (Privileged to work with children, young people and families, Proud to be a children and young people’s nurse, Passionate about our profession and Purposeful about our role).

**Our principle:**
The organisation should exhibit a dominant culture which supports the organisation in its aim to remain consistent and stable as well as being adaptable and flexible in dealing with change and demand.

**Unique contribution of children and young people’s nursing:**
Nurses form the greatest proportion of the children and young people’s workforce in the organisation. They are uniquely placed to influence the development of a positive culture.

"Organisational culture is a system of shared values and beliefs about what is important, what behaviours are appropriate and about feelings and relationships internally and externally. Values and cultures need to be unique to the organisation, widely shared and reflected in daily practice and relevant to the company purpose and strategy"

*The Chartered Institute of Personnel and Development (2004)*

*Vision and Values: organisational culture and values*
Using the learner’s voice for better learning and better care

Guidance for learners

Learners have an important role in raising concerns about the standard of care (Francis Report, 2013¹). You will face unfamiliar and challenging situations, but this cannot account for witnessing problems with care delivery, the environment, clinical resources or believing someone is being put at risk, abused or neglected.

Your view is respected and will be acknowledged and acted on. You should be able to raise any questions or concerns with your placement educator and not fear reprisals or negative feedback.

If you have a concern, speak to someone:

1. Speak to your placement educator.
2. If you are not able to speak to them for any reason, talk to the placement manager or a lead clinician.
3. Contact the leads for education in practice (e.g. Practice Education Facilitator, Work Based Education Facilitator, Undergraduate Medical Education Manager, or Cadet Lead).*
4. Use the local incident reporting system* or speak to the Patient Safety team.*
5. If you are not happy to raise the issue with the placement, contact your tutor or learner support at your Education Provider.

Health Education North West and your placement and education providers work in partnership to ensure the safety and quality of the learning environment. Concerns raised by learners provide a learning opportunity and will be taken seriously, acted on and outcomes shared.

¹ Local details available in the placement work area

Health, Safety and Risk Management Policy:

Student’s Responsibilities whilst on Practice Placement
The Health and Safety at Work Act (1974) sets out the duties of employers and employees* to ensure, improve and promote, as far as it is reasonably practicable, health and safety at work. The Health and Safety Executive (1996) have outlined an Approved Code of Conduct as guidance on the implementation of the Health and Safety at Work Act.

The Higher Education Institutions (HEIs) and partnership organisations recognise their responsibility to provide effective health and safety management systems. It is equally the responsibility of each student to operate within those safe systems of work that have been put in place within the practice setting.

It is important that this document is read in relation to specific HEI and Trust policies.

As a student you are required to:

- Locate and familiarise yourself with the health, safety and risk management policy documents, including completed risk assessments, in each placement area in accordance with your Practice Assessment Document, by discussion of local policies at the placement initial interview.

- Report any breaches of health, safety and other risk management issues that may affect you or others in the practice setting, in accordance with the relevant partnership organisation and HEI policies and procedures.

- Ensure you are aware of the risk assessment system in place and control measures required to reduce or eliminate identified risks.

- Inform the following people when an additional risk assessment is required as a result of a change in circumstances, such as pregnancy, illness or injury:
  - The Programme Lead (University of Salford and Manchester Metropolitan University) or Unit Lead (The University of Manchester).
  - The Personal Tutor (University of Salford and Manchester Metropolitan University) or Academic Advisor (The University of Manchester).

*For the purposes of this policy document students will be classed as employees on placement, whilst remaining supernumary.

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Version 1: December 2011 Review Date: December 2012
You are required to notify the mentor as soon as possible, who will work with the PEF to ensure that the appropriate risk assessment is completed and implemented to ensure your health, safety and well-being within the workplace.

- Attend and complete mandatory inductions and health and safety updates within the partnership organisation and the HEI in which you are undertaking your studies.

- Follow the correct local reporting mechanisms and forward copies of the completed incident report to the HEI should you become involved in an adverse incident whilst on placement. If you are required to complete a statement, advice and support should be sought from your Personal Tutor (University of Salford and Manchester Metropolitan University) or Academic Advisor (The University of Manchester).

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References


Working with substances hazardous to health
A brief guide to COSHH

Introduction

This leaflet describes how to control hazardous substances at work, so they do not cause ill health. It will help you understand what you need to do to comply with the Control of Substances Hazardous to Health (COSHH) Regulations 2002 (as amended), which apply to the way you work with these substances.

This leaflet provides measures that you, as an employer, may need to do to protect your employees from hazardous substances at work. It will also be useful to employees and their safety representatives.

Why do I need to read this leaflet?

Every year, thousands of workers are made ill by hazardous substances, contracting lung diseases such as asthma, cancer and skin disease such as dermatitis. These diseases cost millions of pounds each year to:

- industry, to replace the trained worker;
- society, in disability allowances and medicines; and
- individuals, who may lose their jobs.

You, as the employer, are responsible for taking effective measures to control exposure and protect health. These measures can also improve production or cut waste.

Myth ‘Of course it’s safe—we’ve always done it this way.’

Reality Some diseases take years to develop. If exposure is high because the task has always been done that way, maybe it’s time for a change.

Looking after your business

Your aim in running your business is to make a profit. You know what you do, and how you are doing it. You know what ‘processes’ and ‘tasks’ are involved. You know the short cuts. Ensuring your workers remain healthy may also lead to healthy profits.

Which substances are harmful?

- Dusty or fume-laden air can cause lung diseases, eg in welders, quarry workers or woodworkers.
- Metalworking fluids can grow bacteria and fungi which cause dermatitis and asthma.
- Flours, bulbs, fruit and vegetables can cause dermatitis.
- Wet working, eg catering and cleaning, can cause dermatitis.
- Prolonged contact with wet cement in construction can lead to chemical burns and/or dermatitis.
- Benzene in crude oil can cause leukaemia.

Many other products or substances used at work can be harmful, such as paint, ink, glue, lubricant, detergent and beauty products.

1 of 10 pages
Myth: "It’s natural so it can't be harmful."

Reality: Natural materials can be harmful. For example, horsehair can cause dermatitis and ashafras, wood dust can cause asthma, stone or concrete dust can cause lung disease such as silicosis, and citrus oils can cause skin problems.

Ill health caused by these substances used at work is preventable. Many substances can harm health but, used properly, they almost never do.

Find out the dangers in your business – ask your supplier, your trade association, and check for your industry on HSE’s website: www.hse.gov.uk.

Substances can also have other dangerous properties. They may be flammable, or example solvent-based products may give off flammable vapour. Clouds of dust from everyday materials, such as wood dust or flour, can explode if ignited. This leaflet does not deal with flammability or explosion hazards (see ‘Find out more’).

**Look at each substance**

Which substances are involved? In what way are they harmful? You can find out by:
- checking information that came with the product, eg a safety data sheet;
- asking the supplier, sales representative and your trade association;
- looking in the trade press for health and safety information;
- checking on the Internet, eg HSE’s website pages for your trade.

**Think about the task**

If the substance is harmful, how might workers be exposed? By:
- breathing in gases, fumes, mist or dust?
- contact with the skin?
- swallowing?
- contact with the eyes?
- skin puncture?

Bear these in mind when you look at the tasks.

**Exposure by breathing in**

Once breathed in, some substances can attack the nose, throat or lungs while others get into the body through the lungs and harm other parts of the body, eg the liver.

**Exposure by skin contact**

Some substances damage skin, while others pass through it and damage other parts of the body. Skin gets contaminated:
- by direct contact with the substance, eg if you touch it or dip your hands in it;
- by inhalation;
- by substances landing on the skin, eg airborne dust;
- by contact with contaminated surfaces – this includes contact with contamination inside protective gloves.

**Exposure by swallowing**

People transfer chemicals from their hands to their mouths by eating, smoking etc without washing first.

**Exposure to the eyes**

Some vapours, gases and dusts are irritating to the eyes. Caustic fluid splashes can damage eyesight permanently.
**Exposure by skin puncture**

Risks from skin puncture such as butchery or needlestick injuries are rare, but can invoke infections or very harmful substances, eg drugs.

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**Safety data sheets**

Products you use may be ‘dangerous for supply’. If so, they will have a label that has one or more hazard symbols. Some examples are given here.

These products include common substances in everyday use such as paint, bleach, solvent or fillers. When a product is ‘dangerous for supply’, by law, the supplier must provide you with a safety data sheet. Note: medicines, pesticides and cosmetic products have different legislation and don’t have a safety data sheet. Ask the supplier how the product can be used safely.

Safety data sheets can be hard to understand, with little information on measures for control. However, to find out about health risks and emergency situations, concentrate on:

- Sections 2 and 16 of the sheet, which tell you what the dangers are;
- Sections 4-8, which tell you about emergencies, storage and handling.

Since 2009, new international symbols have been gradually replacing the European symbols. Some of them are similar to the European symbols, but there is no single word describing the hazard. Read the hazard statement on the packaging and the safety data sheet from the supplier.

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**European symbols**

- Skull: Very toxic
- Explo: Explosive
- High temp: High temperature
- Emery temp: Emery temperature
- Oxid: Oxidising
- Radio: Radioactive
- Oedd: Oedifying
- Corros: Corrosive
- Flammable: Flammable
- Pois: Poisonous
- Irrit: Irritant

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**Hazard checklist**

- Does any product you use have a danger label?
- Does your process produce gas, fume, dust, mist or vapour?
- Is the substance harmful to breathe in?
- Can the substance harm your skin?
- Is it likely that harm could arise because of the way you use or produce it?
- What are you going to do about it?
  - Use something else?
  - Use it in another, safer way?
  - Control it to stop harm being caused?

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Working with substances hazardous to health

1 of 10 pages
Assessing risk

Risk assessment is not just a paper exercise. It’s about taking sensible steps to prevent it happening. You need to know how workers are exposed, and to how much, before you can decide if you need to do anything to reduce that exposure. The COWI Regulations require employers to assess the risk to their employees, and to prevent or adequately control those risks. Sometimes, it is easy to judge the amount of exposure to substances and decide what you can do about it.

When the task involves very small amounts of material, even if those are harmful, whether there is little chance of it escaping, the risk is low. But the risk in a different task – such as cleaning up and disposal – will be higher because the harmful substance may be breathed in or get onto the skin.

When the task involves larger amounts of material, with obvious leaks, exposure is higher and so is the risk. Whether the substance is harmful or not; your need to control it is obvious. Decide what measures you need to take, and when.

If you have five or more employees, you must record your assessment, but even if you have fewer than five, it makes sense to write down what steps you have taken to identify the risks. And the really important part is making a list of the actions you are taking to control the risks to health. You can look at examples of risk assessments for different industries on www.hse.gov.uk/askacases/Stories.

HSE has developed a free internet tool for identifying good control practices: www.coshh-essentials.org.uk. It covers a wide range of processes and activities and also provides advice and guidance for products that have safety data sheets.

However, there may be no ‘good practice’ advice available for your process. Where this is the case, when using obvious control measures you can do the assessment yourself. In other cases, or where you are not sure, ask your supplier, trade association or other reliable information sources. You may need professional advice such as an occupational hygienist – see ‘Getting help’.

What are exposure control measures?

Control measures are always a mixture of equipment and ways of working to reduce exposure. The right combination is crucial. No measure, however practical, can work unless they are used properly.

So any ‘standard operating procedure’ should combine the right equipment with the right way of working. This means instructing, training and supervising the workers doing the tasks.

You need control measures that work and continue to work – all day, every day.
### Examples of control measures

<table>
<thead>
<tr>
<th>Substance, process</th>
<th>Control equipment</th>
<th>Way of working</th>
<th>Managing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing with solvent on rag.</td>
<td>Use a rag holder. Provide a small bin with a lid for used rags.</td>
<td>Acid skin contact. Reduce solvent vapour from used rags.</td>
<td>Check controls are used. Safe disposal.</td>
</tr>
<tr>
<td>Dust and sparks from abrasive wheel.</td>
<td>Put an enclosure around the wheel and extract the air to a safe place.</td>
<td>Check the airflow indicator. Make sure the extraction works.</td>
<td>Maintain controls. Test controls as required by law.</td>
</tr>
<tr>
<td>Fumes from cutting demolition scrap.</td>
<td>Ventilated welding helmet. Gloves. Washing facilities.</td>
<td>Work outdoors away from the fume whenever possible. Allow the fume to clear before removing helmet.</td>
<td>Check if there is any lead paint on the scrap being cut. Carry out health checks.</td>
</tr>
<tr>
<td>Cutting-fluid mist from a lathe.</td>
<td>Put an enclosure around the lathe and extract the air to a safe place. Protective goggles.</td>
<td>Use skin-care products. Make sure the extraction works. Allow time for the mist to clear from the enclosure before opening it.</td>
<td>Train workers. Check and maintain fluid quality. Test controls as required by law. Carry out health checks.</td>
</tr>
<tr>
<td>Dust from disc cutter on stone worktop.</td>
<td>Use an enclosure to extract air to a safe place. High-efficiency vacuum cleaner.</td>
<td>Cut and polish worktops inside an enclosure. Vacuum up dust.</td>
<td>Test and maintain controls. Carry out health checks.</td>
</tr>
</tbody>
</table>

### Myth
They wouldn’t sell it to us if it wasn’t safe.

### Reality
Just because something is available to buy, does not mean it is safe – you can buy cyanide for industrial use.

### Choosing control measures

In order of priority:

1. Eliminate the use of a harmful product or substance and use a safer one.
2. Use a safer form of the product, eg paste rather than powder.
3. Change the process to emit less of the substance.
4. Enclose the process so that the product does not escape.
5. Extract emissions of the substance near the source.
6. Have as few workers in harm’s way as possible.
7. Provide personal protective equipment (PPE) such as gloves, covers and a respirator. PPE must fit the wearer.

If your control measures include 5, 6 and 7, make sure they all work together.

### Control equipment

Control equipment comes in many forms. It includes ventilation to extract dust, mist and fume; glove boxes and fume cupboards; spray booths and refuges (clean rooms in dirty work areas). It also includes using water to reduce dust, and systems for diluting cooling water.

For control equipment, your supplier should provide a ‘user manual’. If you don’t have one, ask for it. And if this is impossible, you may need professional help to write one. The user manual should set out schedules for checks, maintenance and parts replacement. For example it should include:

Working with substances hazardous to health
Myth: "I've given them all masks – problem solved."

Reality: This won’t solve it. Control the source of exposure and then they might not need masks.

- a description of the system;
- the daily checks the worker or supervisor needs to carry out, eg the ventilation is turned on, the airflow indicator gives the right reading;
- the weekly or monthly checks the supervisor or owner needs to carry out, eg of equipment wear and tear, and that short cuts are not creating dangers;
- details of any thorough examination and test;
- signs of wear and control failure;
- a list of replaceable parts;
- a description of how operators should use the system so it works effectively.

Remedy defects in good time. It is pointless making checks if you take no action when something is wrong. And you are not managing health and safety properly if the ‘thorough examination and test’ produces a long list of ‘actions needed’.

Keep simple records of your checks and actions, eg in a logbook, and keep these records for at least five years.

Staying in control: Checking and maintaining

Once you’ve got control, you need to keep it. As the employer, you must make sure that the control measures equipment and the way of working keep working properly.

You should name someone to be in charge of checking and maintaining control measures. It could be you, or someone you appoint, as long as they know what they need to do, and are able to do it. That is, they are ‘competent’ to:

- check that the process isn’t emitting uncontrolled contaminants;
- check that the control equipment continues to work as it was designed;
- check that workers follow the right way of working.

Two of the most common control measures where maintenance is critical are local exhaust ventilation (LEV) and personal protective equipment (PPE).

Local exhaust ventilation (LEV)

If you use local exhaust ventilation to control exposure, it needs regular checking and thorough examination and testing at least once every 14 months or at more frequent intervals if you are using it with one of the processes listed in Schedule 4 of COSHH.

Many people, eg engineers or insurance companies can carry out thorough examination and testing of LEV. Whoever does the work must be competent – see ‘Getting help’.

Personal protective equipment (PPE)

Personal protective equipment is often used as part of control measures. This also needs checking and maintenance because, if it fails, it no longer provides protection and exposes the wearer to danger. The users need to know exactly what they are doing, and so do the supervisors.

PPE suppliers and trades associations can tell you about training in how to use it properly. See ‘Getting help’ and ‘Further information’.
Checklist for good control practice

☐ Do you design and run your processes to keep the spread of contaminants as low as possible?
☐ Do you think about all routes of exposure – breathing in, on skin or swallowing?
☐ Do you choose control measures according to the amount of substance, how it gets into the body and how much harm it will cause?
☐ Do you make sure that measures are effective, easy to use, and work properly?
☐ Do you also need to issue personal protective equipment (PPE)?
☐ Do you check regularly that measures continue to work, and keep simple records?
☐ Do you tell workers about the dangers and how to use control measures properly?
☐ Do you avoid increasing the overall health and safety risks when making changes?

Skills and experience

Competence

Ensure that whoever designs, installs, maintains and tests your control measures is competent – they have the necessary skills, knowledge and experience. You can assess the competence of equipment and service providers with questions such as:

- Have you done this sort of work before?
- What are your qualifications?
- Do you belong to a professional organisation?
- Can I speak to previous clients?

Ideally, you want someone who knows your industry, has a successful track record, and gives good value for money.

Worker involvement

Invoke your workers in developing control measures to make sure they are suitable for the way they carry out the work. Encourage them to suggest improvements, and to report anything they think might be going wrong.

Training, instruction and information

Explain to your workers, and anyone else who needs to know, what the dangers are. It is poor practice just to hand them a page of written information.

- Show workers how to use control measures properly, and how to check that they are working.
- Carry out practice drills for cleaning up spills safely – do this before any spillages happen.
- If workers need to use respirators, they also need face fitting and training.
- If they need to use protective gloves, they need to know how to put them on and take them off without contaminating their skin. See 'Find out more'.

Working with substances hazardous to health
Keeping workers healthy

Monitoring exposure

Monitoring normally means air sampling but it may also involve taking biological samples, e.g. breath or urine. Monitoring normally makes reference to ‘Workplace Exposure Limits’ (WELs), published by HSE. These limits should not be exceeded (see EH40 in ‘Find out more’).

It is wasteful to try monitoring before you have put any control measures in place (see COSHH essentials sheet C409 www.hse.gov.uk/pubns/guidance/c409.pdf on air monitoring).

Health checks

If your trade press, HSE, or other information, shows there is a problem with health in your trade, such as asthma or dermatitis, your employees may need special health checks. The most common checks are for respiratory disease such as asthma and skin disease. See ‘Find out more’.

REACH

REACH is a European Union regulation concerning the Registration, Evaluation, Authorisation and restriction of Chemicals. It came into force on 1 June 2007 and replaces a number of European Directives and Regulations with a single system.

REACH will operate alongside COSHH and is designed so that better information on the hazards of chemicals and how to use them safely will be passed down the supply chain by chemical manufacturers and importers through improved safety data sheets.

Getting help

<table>
<thead>
<tr>
<th>What and who?</th>
<th>Trade association</th>
<th>HSE</th>
<th>Consultants/service suppliers</th>
<th>Local health and safety groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good control</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Testing LEV</td>
<td>✓</td>
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<td>Training</td>
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<td>Monitoring</td>
<td>✓</td>
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<td></td>
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<tr>
<td>Health checks</td>
<td>✓</td>
<td>✓</td>
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<td></td>
</tr>
</tbody>
</table>

This is not an inclusive list, but some useful sources of information and help are:

- **The Occupational Safety and Health Consultants Register (OSHCR)**
  www.hse.gov.uk/oshcr/index.htm

  OSHCR is a register of consultants who can offer general advice to UK businesses to help them manage health and safety risks.


  BOHS is the professional body for occupational hygienists, who understand how workplace hazards affect worker health and systems to control risks to health from work. The website has a list of consultants.

- **Health & Safety Laboratory (HSL) Business Development Group, Health & Safety Laboratory, Harpur Hill, Buxton, Derbyshire SK17 6JN. Tel: 01298 218000 www.hsl.gov.uk.**

  HSL's services include specialist advice and consultancy, risk assessment, and workplace monitoring (including biological monitoring).

- **Institution of Occupational Safety and Health (IOSH) The Grange, Highfield Drive, Wigston, Leicestershire LE18 1NN. Tel: 0116 2573100 www.iosh.co.uk.**

  IOSH is the association for health and safety professionals. The website allows you to search for consultants.

- **United Kingdom Accreditation Service (UKAS) 21-47 High Street, Feltham, Middlesex TW13 6JN. Tel: 020894 17600 www.ukas.com.**

  The UKAS website has a search function to find accredited testing and inspection service providers.

- **Trade associations** Health and safety information is often produced by trade associations and published in the trade press.

- **Occupational health professionals (doctors or nurses)** Look in Yellow Pages or other trade indexes for occupational health under ‘Health and Safety Consultants’ or ‘Health Authorities and Services’, or visit www.mhasplus.nhs.uk.

- **Safety Groups UK (SGUK)** Edgaston Park, 358 Bristol Road, Edgaston, Birmingham B5 7ST. Tel: 0121 246 2011 www.safetygroupsuk.org.uk

Working with substances hazardous to health
Find out more

HSE COSHH website: www.hse.gov.uk/coshh/index.htm

A short guide to the Personal Protective Equipment at Work Regulations 1992

Cleaning the air: A simple guide to buying and using local exhaust ventilation (LEV)

D4/2006 Workplace exposure limits: Containing the list of workplace exposure limits for use with the Control of Substances Hazardous to Health Regulations 2002 (as amended) Environmental Hygiene Guidance Note EH40 (Second edition)

Fire and explosion: A brief guide to DSEAR in the workplace Leaflet INDG370(rev1)

Preventing contact dermatitis at work Leaflet INDG233(rev1) HSE Books 2007
www.hse.gov.uk/pubns/indg233.pdf

Read the label: How to find out if chemicals are dangerous Leaflet INDG382(rev1)

Respiratory sensitizers and COSHH: Breathe freely – An employer’s leaflet on preventing occupational asthma Leaflet INDG86(rev2) HSE Books 1995
www.hse.gov.uk/pubns/indg86.pdf

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet can be found at www.hse.gov.uk/pubns/indg130.htm

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