UHL Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment	University Hospitals of Leicester NHS NHS Trust **CMG: ITAPS** **Trust Ref: C3/2024**

1. Introduction

- There are increasing numbers of surgical, diagnostic and therapeutic procedures performed outside of the main theatre environment.
- These procedures may require anaesthetic interventions through monitored care, sedation, regional anaesthesia or general anaesthesia.
- The challenge for anaesthesia is to develop a framework that supports and regulates the safe delivery of anaesthetic care.
- This guidance should be applied to all non-theatre services delivered that require anaesthetic interventions.
- The physical environment can be challenging for the safe provision of anaesthesia when compared with the main theatre environment.
- Personnel should be appropriately trained resuscitation providers, basic life support (BLS) in adult areas and paediatric intermediate life support (PILS) in paediatric areas.
- The safe delivery of anaesthesia through pre-operative assessment, case selection, anaesthesia delivery, recovery and post-operative care should not be compromised.
- Staff working in these areas should be familiar with procedure-specific risks such as radiation exposure and infection control.
- Compliance with the safe surgery checklist is obligatory.

2. Guideline Standards and Procedures

2.1.Target audience:

All staff groups providing anaesthesia to patients under the care of an anaesthetists in the non- theatre environment, including (but not restricted to) consultants, associate specialists and specialty (SAS) anaesthetists, anaesthetists in training, operating department practitioners (ODPs), anaesthetic assistants and nurses.

2.2. Target population

All ages of patients undergoing anaesthesia in the non-theatre environment under the care of an anaesthetist.

2.3. Healthcare setting

All non-theatre settings within the University Hospitals of Leicester in which anaesthesia services are provided.

Leicester Royal infirmary (LRI):

- Emergency Department (ED)
- Radiology (CT& MRI) .
- Brachytherapy unit,
- community dental suite.
- Interventional Radiology.
- Assisted Conception Unit (ACU)
- Ward 27 (Paediatric Oncology)

Glenfield Hospital (GGH):

- The Imaging suite (CT& MRI).
- Interventional Radiology, including microwave ablation, ERCP and other general interventions.
- Coronary Care Unit (CCU).
- Bronchoscopy.
- Cardiac catheter suite.
- ECT at the Bradgate unit.

Leicester General Hospital (LGH):

- Radiology

2.4. Exclusions:

- Provision of services provided by a specialty other than anaesthesia.
- Patients undergoing anaesthesia within a critical care setting.
- Patients undergoing anaesthesia in a non-hospital environment.

2.5.Recommendations:

Staffing requirements

- A clinical lead for anaesthesia in the non-theatre environment (ANTE) should be appointed with adequate time provided within their job plan. They should be involved in developing the service and ensuring that safety standards are met and regular audits are conducted.
- An escalation policy for emergencies should be in place and should be understood by all medical, healthcare professional and managerial staff:

    - At LRI: cardiac arrest calls in case of cardiac arrest. In case of difficulties, will need to call the PACU consultant on #6873 from UHL landline or 07929835621.
    - At GGH:
        - Cardiac arrest call in case of cardiac arrest and in case of difficulties, will need to call the NCEPOD consultant in theatre 1.
        - Cardiac catheter suite emergencies, call should go to floor control to contact cardiac team.
    - At LGH: contact Trouble-shooter consultant or Hybrid consultant via bleep 3200

- Anaesthetists in training should be given the appropriate level of responsibility according to their competence and level of training and must be appropriately supervised at all times.
- For emergency interventional procedures in radiology department outside normal working hours for which anaesthesia services may be required, staffing this service will be provided by the emergency theatre team.
- A dedicated, skilled anaesthetic practitioner (ODP) should be available in all locations outside the operating theatre where anaesthesia is undertaken by an anaesthetist.
- Patients recovering from anaesthesia or sedation in an isolated unit should receive the same standard of care as that required in an operating theatre post- anaesthetic care unit (PACU) by appropriately trained personnel.

facilities, Equipment and services

Facilities:

- Access to lifts for easy trolley transfer should be available.
- Procedure rooms should be large enough to accommodate equipment and personnel with enough space to move safely and enable easy access to the patient at all times.
- Environments in which patients receive anaesthesia or sedation should have full facilities for resuscitation available, including defibrillator, suction, oxygen, airway devices and a means of providing ventilation.
- It should also be possible to arrange transfer of a patient from the procedure room to other areas within the institution if necessary.
- Facilities to allow access to online information, such as electronic patient records, local guidelines and clinical decision aids, should be available.
- A post-anaesthesia care unit or equivalent should be available for each patient at the end of the procedure.

Equipments:

- All patient trolleys should be capable of being tipped into the head down position and be easily transferrable to the rest of the hospital.
- Equipment for monitoring should be available at all sites where patients receive anaesthesia or sedation. For patients receiving conscious sedation, this should include pulse oximetry.
- Continuous waveform capnography should be available for all patients undergoing general anaesthesia and moderate or deep sedation.
- The anaesthetist should ensure that an adequate supply of oxygen is available before starting any procedure.
- All anaesthetic equipment should be standardised where possible in all areas providing anaesthetic services, including equipment for resuscitation and life support, and such equipment subject to a standardised programme of maintenance.
- All anaesthetic equipment should be checked before use in accordance with the Association of Anaesthetists published guidelines. Anaesthetic machine checks should be recorded in a log and theatre checklist.

- All procedures should be compliant with National Safety Standards for Invasive Procedures (NatSSIPs) and the Safe Surgery Checklist. An appropriate ‘pre list check’ of the anaesthesia systems, facilities, equipment, supplies and resuscitation equipment should be performed prior to the start of each list.
- Appropriate equipment should be available to monitor a patient’s temperature, to minimise heat loss and to provide active patient warming

Medication:

- Wherever anaesthesia or sedation is undertaken, a full range of emergency drugs including specific reversal agents should be available.
- In remote locations where anaesthesia is undertaken, drugs to treat rare situations, such as dantrolene for malignant hyperthermia, or intralipid for local anaesthetic toxicity should be located in a designated area. (see appendix).

  Robust systems should be in place to ensure reliable medicines management, including storage facilities, stock review, supply, expiry checks, and access to appropriately trained pharmacy staff to manage any drug shortages

- All local anaesthetic solutions should be stored separately from intravenous infusion solutions, to reduce the risk of accidental intravenous administration
- All drug-containing infusions and syringes should be clearly labelled.
- Prefilled syringes supplied by the pharmacy should be considered, especially in areas where anaesthesia is delivered in an emergency

Services:

- Patients should be appropriately monitored during their recovery.
- Patients should stay for at least 20 minutes in recovery after general anaesthesia or sedation and to be looked after by a trained recovery practioner.
- Patients recovering from anaesthesia or sedation in an isolated unit should receive the same standard of care as that required in an operating theatre post-anaesthesia care unit.
- Where recovery is not possible in an isolated environment, arrangements should be in place to transfer the patient to an appropriate recovery area or PACU.

- The main theatre recovery should be viewed as the backstop recovery area should there be any concern about the ability to provide high quality recovery care at the remote site.
- The care of the patient remains the responsibility of the anaesthetist up to discharge for ambulatory procedures or ward transfer for inpatient procedures.

Magnetic resonance imaging

- Essential anaesthetic equipment are located in radiology, these should be checked by the Theatre ODP's
- MRI compatible anaesthetic machine, kept in scan room and not to be moved
- Non-MRI compatible anaesthetic machine located outside the scan room.
- Remote monitoring of the patient with slave screens should be available to allow the anaesthetic team to monitor the patient from outside of the magnetic field.
- All non- essential pumps and equipment should be removed from the patient before entering the magnetic field. Infusions with extra-long giving sets to be used when MRI specific pumps are not available.
- The patient and all staff should have an MRI safety and exclusion questionnaire completed before entering the magnetic field.
- In the event of an adverse incident in the MRI scanning room, the patient should be removed from the scanning room without delay; immediate access to an anaesthetic preparation room or resuscitation area is essential.

Interventional radiology

- Interventional vascular radiology may involve treating unstable patients with severe haemorrhage. Such patients may include those with significant gastrointestinal bleeding or patients with postpartum haemorrhage. Equipment to deal with these patients should be immediately available. This includes that necessary to introduce and monitor a variety of intravascular catheters, rapid infusion devices, blood and fluid warming devices and patient warming devices.
- The hospital's protocol for major haemorrhage should be available.
- Procedure specific agents such as those required to monitor coagulation and arterial blood pressure should be available.

Gastrointestinal procedures

Anaesthetists are not usually involved in the routine sedation of patients for endoscopy, and non- anaesthetic personnel should follow the guidance on sedation provided by their respective colleges. Anaesthetic involvement may be requested for high risk patients, or complex procedures at LRI such cases are done in the emergency theatre and are dealt with in the same way as emergency surgical procedures.

- Monitoring of patients receiving anaesthesia or sedation for endoscopy provided by anaesthetic personnel should be the same as other anaesthesia services.
- High-flow nasal oxygen therapy should be available for anaesthesia-delivered sedation or general anaesthesia for high risk endoscopic procedures.
- The post-anaesthetic recovery facilities when provided for patients following anaesthesia delivered sedation or anaesthesia should be the same as other anaesthesia services.

3. Education and Training

- All anaesthetists should be fully familiarised with all remote areas of anaesthetic provision, e.g. as part of their induction process, prior to undertaking anaesthetic procedures in that location.
- Anaesthetic trainees should have successfully completed the relevant higher units of training and should be supervised at an appropriate level (1–4), which varies depending on their stage of training, their previous experience and capability, their familiarity with the specific remote site, and the complexity of the procedure.
- All anaesthetists with a job plan including sessions in non-theatre anaesthesia should be able to demonstrate continued competency through maintenance of an appropriate level of experience, and ongoing participation in relevant continuing professional development.
- Difficult tracheal intubation equipment, waveform capnography and training for the management of the emergency airway should be available.
- Sedation techniques are frequently used in the non-theatre environment along with anaesthetic techniques. Sedation is regarded as a core competency for anaesthetic practice and training/exposure should be provided to current standards at basic, intermediate and higher levels.

- Hospitals should consider involving an anaesthetist in the training of non-anaesthetists in the provision of safe sedation.
- Organisational factors such as teamwork, communication and the use of checklists when working in less familiar environments are important.
- At the team briefing, an explicit plan should be agreed for getting help if needed; e.g. in the event of high blood loss, and life-threatening loss of the airway or respiratory function.
- Environmental hazards such as radiation exposure, magnetic resonance (MR) fields and lack of a scavenging system should be considered by all staff before the start of each list.
- Documentation, to the standard used in the operating theatre, should be kept for all cases and this should include the grade and specialty of the doctor performing and supervising the anaesthetic along with the name of the supervising consultant designated to provide direct or indirect advice

4. Monitoring Compliance:

- Organisational factors such as teamwork, communication and the use of checklists when working in less familiar environments are important.
- At the team briefing, an explicit plan should be agreed for getting help if needed; e.g. in the event of high blood loss, and life-threatening loss of the airway or respiratory function.
- Environmental hazards such as radiation exposure, magnetic resonance (MR) fields and lack of a scavenging system should be considered by all staff before the start of each list.
- Documentation, to the standard used in the operating theatre, should be kept for all cases and this should include the grade and specialty of the doctor performing and supervising the anaesthetic along with the name of the supervising consultant designated to provide direct or indirect advice.

5. Supporting References

1. Guidelines for the Provision of Anaesthesia Services in the Non- theatre Environment 2023 https://www.rcoa.ac.uk/sites/default/files/documents/2023-01/Chapter 7 Guidelines for the Provision of Anaesthesia Services in the Non-theatre Environment 2023_0.pdf
2. Guidelines for the Provision of Anaesthesia Services in the Non- theatre Environment 2020 https://www.rcoa.ac.uk/sites/default/files/documents/2020-02/GPAS-2020-07-ANTE.pdf
3. Guidelines for the safe provision of anaesthesia in magnetic resonance units 2019. Anaesthesia 2019, 74, 638–650
4. AAGBI Recommendations for standards of monitoring during anaesthesia and recovery 2015 https://www.aagbi.org/sites/default/files/Standards_of_monitorin g_2015_0.pdf
5. AAGBI Safety Guidelines Immediate Post-anaesthesia Recovery 2013 https://www.aagbi.org/sites/default/files/immediate_post- anaesthesia_recovery_2013.pdf
6. Royal College of Anaesthetists and Royal College of Emergency Medicine. *Emergency Airway Management*. London, 2015 https://rcem.ac.uk/wp-content/uploads/2022/03/Emergency_Airway_Management_Joint_Statement_December_15.pdf

Royal College of Emergency Medicine and Faculty of Intensive Care Medicine. Better Together: Collaborative working between emergency and critical care. London, 2021 https://rcem.ac.uk/wp-content/uploads/2021/10/RCEM_FICM_Better_Together_Framework.pdf

7. Key Words:

Remote location, non- theatre, Sedation, radiology, MRI

CONTACT AND REVIEW DETAILS	
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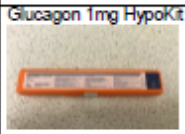
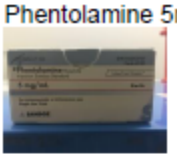
Details of Changes made during review:	

Appendix:

RARE EMERGENCY DRUG LOCATIONS WITHIN THEATRE AREAS UHL SITE: LEICESTER GENERAL HOSPITAL			
INDICATION	DRUG	LOCATION (S) Area	Cupboard
Malignant hyperthermia	 Dantrolene 20mg - don't forget the water for injection	Main theatres Labour theatre EMPCC theatre	Main drug cupboard – No1 emergency shelf Labour theatre outer CD cupboard EMPCC theatre cupboards
Rocuronium reversal	Sugammadex 200mg, 500mg 	Main th recovery Theatre 7 recovery Ortho recovery Obstetric recovery Theatre 9 recovery ICU EMPCC theatre	Black emergency box & 200mg vial stock Black emergency box 200mg vial stock in potassium cupboard 200mg vial stock in main cupboards
Local Anaesthetic toxicity	Intralipid 20% 500ml  (Note: instructions attached to bag)	Main th recovery Theatre 7 recovery Ortho recovery Obstetric recovery Theatre 9 recovery ICU Labour theatre Pain cupboard(radiology) Day case th1 Theatre 7B EMPCC theatre	Drug cupboards in the recovery areas ICU- Potassium cupboard Drug cupboards
Phaeochromo-cytoma	Phentolamine 5mg/ml 	Theatre 6 	Main Fridge (Note packaging may differ with different manufacturers)
Thrombolytic for embolism	Alteplase 20mg, 50mg 	Main theatres ICU	Main drug cupboard – No1 emergency shelf ICU- Blue cupboard
Hypo-glycaemia	Glucagon 1mg HypoKit 	Main theatres ICU  EMPCC theatre	Main theatre fridge Theatre recovery fridge Main fridge In ALL hypo boxes
Anaphylaxis	Vasopressin injection (Argipressin) 20units in 1ml 	Main theatres Theatre 7A ICU 	Fridge (Note packaging may differ with different manufacturers)

Last updated 18th May 2023 JTO/MSR

RARE EMERGENCY DRUG LOCATIONS WITHIN THEATRE AREAS UHL SITE: LEICESTER ROYAL INFIRMARY			
INDICATION	DRUG	LOCATION (S) Area	 Cupboard
Malignant hyperthermia	 Dantrolene 20mg - don't forget the water for injection	COD central drug cupboards Adult ITU Labour theatre Ward 27 theatre Eye theatre B EMCHC cardiac theatre	Main cupboard 5 – bottom shelf Drug cupboards Eye Th B CD cupboard Fluid Store
Rocuronium reversal	Sugammadex 200mg, 500mg 	COD Theatre 6 COD Recovery Labour theatre Adult ITU adult COD th. 8 & 11 Gynae theatre 17 A&E Resus Eye theatre B	Black box & 200mg vials 200mg vial stock Black emergency box
Local Anaesthetic toxicity	Intralipid 20% 500ml 	COD central drug cupboards Angio(xRay) Labour theatre Eye theatres EMCHC cardiac theatre	Main cupboard 5 – bottom shelf Drug cupboards Pink Box Eye Th Fluid Store Fluid store
Phaeochromo -cytoma	Phentolamine 5mg/ml  	COD Central Drug Fridge	LABCOLD Drug Fridge – Top Shelf

-Last updated 7th May 2021 NP

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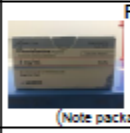
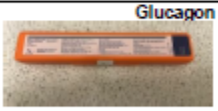
RARE EMERGENCY DRUG LOCATIONS WITHIN THEATRE AREAS UHL SITE:GLENFIELD HOSPITAL			
INDICATION	DRUG	LOCATION (S) Area	Cupboard
Malignant hyperthermia	Dantrolene 20mg - don't forget the water for injection 	Main theatre drug cupboards – corridor AICU Vanguard Theatre	1st cupboard A-Da Bay A Main cupboards Inj I-Z Ward Cupboard
Neuromuscular blocker reversal (Rocuronium reversal)	Sugammadex 200mg, 500mg 	Main theatre drug cupboards – corridor Theatre 9 Theatre recovery AICU Bay A AICU Bay B emergency cupboard CathLab Vanguard Theatre – ward Cupboard	Black emergency box 200mg vial stock Black emergency box 200mg vial stock Black emergency box Black emergency box
Local Anaesthetic Toxicity	Intralipid 20% 500ml  Note: Instructions attached to bag)	Main theatre drug cupboards – corridor AICU Vanguard Theatre	2nd cupboard Hy-Li Emergency Drug cupboards Bay A & B Ward Cupboard
Phaeochromocytoma	Phentolamine 5mg/ml  (Note packaging may differ with different manufacturers)	Main theatre central drug fridge	Fridge between theatres 1&2
Thrombolysis	Alteplase 20mg, 50mg 	Main theatre drug cupboards – corridor AICU Vanguard Theatre	1st cupboard A-Da Bay A main cupboards Bay B injection cupboard 1 Ward Cupboard
Hypoglycaemia	Glucagon 1mg HypoKit 	Main theatre central drug fridge AICU Vanguard Theatre	Fridge between theatres 1&2 Fridge Bays A,B,C Theatre 1, Theatre 2 and Ward Fridge
Anaphylaxis	Vasopressin injection (Argipressin) 20units in 1ml 	Main theatre central drug fridge AICU Vanguard Theatre	Fridge between theatres 1&2 Fridge Bays A,B,C Ward Fridge
Emergency Caesarean section drug pack	Contains: **Oxytocin** Injection 10 units/ml (10X1ml) **Misoprostol** tablets 200micrograms (10 tablets) **Carboprost** injection 250 micrograms (1 vial) **Ergometrine** Injection 500 micrograms/ml (10 amps) **Heparin** injection 5000 units/0.2ml (10 amps)	Main theatre central drug fridge AICU	Fridge between theatres 1&2 Fridge Bay A

-Last updated 26th January 2022 NP/ SP / PP