Caboolture Hospital is a 216-bed hospital providing services in:

- obstetrics and gynaecology
- general surgery
- general medicine
- day surgery, including paediatric ENT
- critical care including coronary care
- emergency medicine
- gastroenterology
- paediatrics, and
- mental health.

Caboolture Hospital is in a process of expansion and renovation, and will double in size by 2022.

It is an easy commute from the city northwards along the Bruce Highway; approximately 60km and 45 minutes when traffic is light.

Welcome to the Department of Anaesthesia. We hope your time in the district will be rewarding and enjoyable.
Administrative Details:

Most pre-commencement communication is through the Medical Workforce Unit 5433 8939 who send out all access forms which require signatures and acceptance. Computer issues - Internet, Email and Network and Auslab access will be set up with logons and passwords which should be forwarded or given to you at hospital orientation. You will be able to complete some mandatory training modules online before commencement.

A payroll number is issued your commencement/appointment letter is signed by the DMS and forwarded to Senior Medical Payroll division.

On Arrival

At the start of the Hospital Employment Year there will be Hospital Orientation for all new doctors, which will include introductions to key staff members, code of conduct, workplace health & safety, infection control, fire safety, administration details and an introduction to our hospital policy of Patient and Family Centred Care (PFCC or Caring Together).

If you are starting at a time of year when there is no Hospital Orientation, then proceed directly to unit orientation.

Present to the anaesthetic office on level 2 at 8:00am on the first morning of your term and meet Dr Ken Eastern or one of the anaesthetic consultants. You should also meet the Anaesthetic Support Officer, Aimee Brooks (5433 8378). She will be able to assist with a lot of practical details. Dr Simone Malan-Johnson (SOT) will orientate you to the department.

You should be Introduced to the:
Anaesthetic consultants
Key nursing staff

Find out the times of:
Pain rounds
Peri-operative clinics
Theatre sessions
Tutorials and departmental meetings (see below)

Find out where:
Weekly allocation rosters are posted
Daily theatre lists are available
You will need to sort out the following:
- Dect phone
- Identification & access card
- Access to Auslab if you are a new Q Health employee
- ask about a locker in the change room
- On-call accommodation will be provided for Consultants who reside more than 25 minutes from the Hospital. There is a sleeping room available for registrars on call.

Familiarise yourself with:
Theatre layout
On-call and handover procedures
Rosters and where to find them
Exits
Fire and evacuation procedures

**Anaesthetic Staff**

We have 11 SMOs, 9 of whom are staff specialists. Some are part-time; we have a total of 8.6 full time equivalents.

We have 7 registrar positions, of which one is an ED registrar We also have one intern or JHO allocated for 10 weeks at a time. QARTS trainees rotate every 6-12 months

Medical students also rotate through the department regularly.

<table>
<thead>
<tr>
<th>Departmental Staff</th>
<th>Special Interests</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Director</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ken Eastern</td>
<td></td>
<td>7110</td>
</tr>
<tr>
<td><strong>Staff Specialists- Anaesthetics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simone Malan- Johnson (P/T)</td>
<td>Medical education</td>
<td>8819</td>
</tr>
<tr>
<td>Sunethra Samarakoon (P/T)</td>
<td>Pain management</td>
<td>8368</td>
</tr>
<tr>
<td>Shanti Kulasinghe</td>
<td>Perioperative medicine</td>
<td>5904</td>
</tr>
<tr>
<td>Hitesh Nischal</td>
<td>Scholar Role Tutor</td>
<td>8306</td>
</tr>
<tr>
<td>Kavitha Erinjippurath</td>
<td>Obstetrics</td>
<td>5884</td>
</tr>
<tr>
<td>Michael Hussey</td>
<td></td>
<td>8871</td>
</tr>
<tr>
<td>Gunjan Chawla</td>
<td>Simulation</td>
<td>8947</td>
</tr>
<tr>
<td>Piret Vaugh</td>
<td>Obstetrics</td>
<td>5499</td>
</tr>
<tr>
<td>Dr Bruce Lloyd (SMO)</td>
<td></td>
<td>5976</td>
</tr>
<tr>
<td>Dr Glenn Hurtado (SMO)</td>
<td></td>
<td>5974</td>
</tr>
</tbody>
</table>
Dress code

- You should be dressed appropriately as a professional person for interviewing patients at the peri-operative clinic.
- You should always wear an ID badge.
- In theatre you must obey the hospital policy on clothing in theatre. This means you must take off clothes worn outside theatre each time you enter the theatre suite. Outside the OT you may wear a gown over theatre clothes, but you must change into fresh theatre clothes when your return.

Departmental teaching sessions:

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday Mornings 7:30 – 9:00</td>
<td>Departmental Meeting</td>
</tr>
<tr>
<td></td>
<td>alternates between M&amp;M,</td>
</tr>
<tr>
<td></td>
<td>journal presentations</td>
</tr>
<tr>
<td></td>
<td>formal presentations</td>
</tr>
<tr>
<td>Tuesday afternoons 13:30 – 16:00</td>
<td>Registrar tutorials</td>
</tr>
<tr>
<td></td>
<td>protected time</td>
</tr>
<tr>
<td></td>
<td>at Redcliffe or Caboolture</td>
</tr>
</tbody>
</table>

The work day:

“Knife to skin” time is 8:30am

- The scheduled start time (08.30 and 13.00) should be considered a knife to skin time wherever possible. It follows that for spinals, epidurals and other special techniques you will need to begin earlier to achieve the list start time.
**Each morning**

- Check the whiteboard for details of nurse allocation for anaesthetics, and where you should be.
- Consultants, if you are on day call, note who the OT Nursing Coordinator is.
  - You should check your anaesthetic machine, draw up your drugs, meet your first patient and cannulate him / her in good time for an 8:30 start.
  - Emergency drugs: We do not encourage you to draw up syringes of metaraminol, ephedrine or phenylephrine routinely for every theatre list due to the cost of wasted drugs. Prepare these medications judiciously for those patients where hypotension is very likely (e.g. spinal or epidural anaesthesia such as on a Caesarian Section list), or where it may be catastrophic, (e.g. elderly patients with significant cardiac disease, patients with aortic stenosis, bowel anastomoses where optimal perfusion is important). Pre-drawn syringes of metaraminol are usually available.

**It is important that the first case on a list starts on time and there are minimal delays between cases on a list.**

**Friday morning surgical lists**

Start time is 09:00 after the Departmental meeting.

**Afternoon lists: 13.00**

The anaesthetic start time should be 12:45, or earlier if a more complex anaesthetic setup is required for major cases. Surgery should be able to begin by 13:00.

From 08.00 on weekdays, a Registrar/JHO assists the Anaesthetic Consultants with theatre lists, ward work and clinics as allocated by a weekly Department roster.

The Anaesthetic Consultant Coordinator rostered on duty is the contact person for the department, and is responsible for delegating staff for anaesthesia for emergency cases, and birth suite calls for epidurals. **The anaesthetic coordinator can be reached at extension 8212 at all times. After hours, this extension will reach the anaesthetic registrar on call.**

**It is departmental etiquette to check in with the co-ordinator when you have finished your day’s list. Make sure there is nothing else to be done before you leave for the day.**
How the Department runs:

**Booked lists:**

Booked lists are usually organised a week in advance. Changes then need to be arranged between the anaesthetist, surgical team and nurse in charge.

The weekly anaesthetic roster is arranged the previous week and circulated on Fridays. Dr Eastern is in charge of rostering.

**Elective Cases:**

**Pre-operative Assessment**

- Patients with significant co-morbidities, or having major surgery attend PAC at least one week prior to their date for admission. They are then admitted on the day of admission. Day procedure patients who are relatively well (ASA I or II) are assessed on the day of the procedure.
  - See Appendix 2: Peri-operative triage
  - See Appendix 3: Peri-operative investigations
- At this clinic the patients are seen by a member of the anaesthetic department and by the perioperative nurses. The aim is to adequately prepare the patient for the operation and the visit to hospital. All patients are required to fill in a check-list of past medical and surgical conditions, allergies, drugs etc. They are also provided with a list of the common and serious risks of anaesthesia.
- Patients are assessed for medical fitness and suitability, and investigations are organised where and when necessary.
- Information is given on the type of anaesthetic and patient preference is noted. Consent for the relevant and appropriate type of anaesthesia is obtained.
- If the operation requires epidural and/or spinal anaesthesia, this must be discussed with the patient. There is a Queensland Health information sheet on spinals and epidurals that may be used to assist this discussion.
- All patients sign a day surgery agreement document to show that they understand the importance of fasting, and of being accompanied on discharge.
- Post operative pain relief is discussed, such as PCA, epidural or other, and recorded on the anaesthetic sheet.
- If there are concerns about a patient’s condition, if the patient is ASA III, or if the patient is for major surgery, then the relevant consultant must be notified.
Any patient with a potential anaesthetic problem should be brought to the attention of a peri-operative clinic nurse. The Patient’s anaesthetic record will then be photocopied and kept on file. These records are inserted into the mail tray of the case consultant anaesthetist each Friday and marked as an “Anaesthetic Alert”.

Caesarean Sections

- The merits of epidural and/or spinal must be discussed with the patient. (The Queensland Health information sheet should be read, and discussed if either or both of these techniques are chosen)
- For elective LSCS, a prescription for Ranitidine 150 mg is given, (to be taken pre-operatively, 2x 150mg orally BD pre-op, the first tablet to be taken the night before the LSCS, the second to be taken on the morning of operation with a sip of water)
- Sodium citrate 30mls orally is given on leaving the ward
- Hb is checked
- Group and hold is currently not done routinely for elective LCSCs according to statistics and risk vs cost data.
- Elective Caesarean Sections are usually performed on a regular list. Other booked sections need to be arranged with the coordinator anaesthetist when they are booked with OT.
- Elective Caesarean Sections should be under epidural, CSE or spinal anaesthesia unless there is a contraindication.
- This rule can be considered for patients with a retained placenta unless severe blood loss contraindicates this method.
- All Emergency Sections are organised with the Registrar on duty who must communicate immediately with the Consultant on call.
- If an epidural catheter is in situ it will probably be used for the anaesthetic for the Caesarean section, with a “top-up” of lignocaine or ropivacaine. Postoperative analgesia may be effected by 3 mg epidural Morphine before the catheter is removed.

INFORMING THE CONSULTANT

Consultants will wish to be notified regarding potential problems with patients on their list. In particular please contact them during the clinic regarding the following:

- emergency Caesarians
  - ASA III or IV cases
- Potentially difficult intubation (Mallampati 3-4 or past history)
- Cardiac/respiratory/endocrine/musculoskeletal disabilities etc
- Drug allergies and anaesthetic problems
- Acute intercurrent illnesses (URTI’s etc.)
- Other problems
Emergency Cases:

In hours these are booked with the anaesthetic co-ordinator. After hours they should be booked with the anaesthetic registrar on call.

We do not have a dedicated Emergency theatre every day. Immediate emergencies are arranged in a spare theatre if enough staff are available, otherwise they “crash” one of the elective lists. Less urgent cases wait until elective lists are done at the end of the afternoon.

Cases are done on a degree of urgency basis and thereafter upon in order of booking. As a rule, only life or limb threatening cases should be done after 9:00pm. After 9:00pm there are no recovery staff, and only one team to run theatre cases and recovery.

Post operative care:

- Prescribing post-operative pain relief and fluid and electrolyte management is an anaesthetic responsibility for ward patients for the first overnight stay.
- It is recommended that you visit your patients post-operatively in the second stage recovery, to ensure there are no problems (and to learn about the efficacy of your anaesthetic technique), as well to foster good public relations. It also provides the patient with an opportunity to express his/her appreciation for your services.
- Complications related to an anaesthetic should be reported to the department. e.g. PONV, spinal headaches, drug reactions, dental problems, and any suspected complications of regional anaesthesia. Adverse events should be recorded on Riskman.
- Occasionally day surgery patients will require admission to the ward for an overnight stay. The relevant surgical or gynaecological PHO needs to be informed when this occurs, and any ongoing treatment discussed, as he/she will be responsible for the patient’s discharge.

Labour ward epidurals:

Requests for these are made via the anaesthetic co-ordinator in hours and via the anaesthetic registrar out of hours.

Labour ward is situated on the same floor as theatres (i.e. level 2).

For each Epidural inserted:
1. Risks and benefits should be explained to the patient &/or partner, and documented in the patients chart.
2. Details of the procedure should be recorded in the patient’s chart.
3. An Epidural Management Form should be completed. This details the conduct of the epidural and gives instructions for the epidural infusion rate.
and concentration, suggested top ups, observations to be recorded and instructions for resuscitation.

4. A Blue Acute Pain Service form should be completed and placed in the Pain Box in the birth suite, or in recovery room.

**Maintenance (PCEA):**
A premixed infusion of Ropivacaine 0.2% + Fentanyl 2 mcg/ml is the common choice for an initial bolus dose and maintenance. Each patient who received an epidural or spinal should be seen for the first 24 hours on the acute pain service ward rounds. Please remember to record all data regarding obstetric spinals and epidurals and Caesarian sections in the ABS data bank.

**Neuraxial techniques and low platelets**

<table>
<thead>
<tr>
<th>Platelets</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;100</td>
<td>No contra-indication for epidural</td>
</tr>
<tr>
<td>&lt;100</td>
<td>Epidural should be performed by consultant (suggest 18G Tuohy needle)</td>
</tr>
<tr>
<td>&gt;= 80</td>
<td>Epidural should be performed by consultant with confirmed normal coagulation profile and ROTEM</td>
</tr>
<tr>
<td>&lt; 80</td>
<td>No epidural, for remifentanil PCA</td>
</tr>
</tbody>
</table>

Spinal can be performed if platelets > 70

**Acute Pain Service**

Daily acute pain rounds are undertaken. An acute pain service nurse is available weekdays, on weekends it is solely up to the anaesthetic department. We follow up all PCAs, patients who have received a spinal or epidural, or regional block. Cover is provided for acute post-operative pain and other acute pain problems.

Please communicate changes to nursing staff on the wards and the parent medical/surgical team.

An entry should be written in the patient’s chart, and on the relevant PCA or PCEA chart.

Problems are referred to the anaesthetist allocated to acute pain service for that day, and after hours to the registrar on call.
Overnight Accommodation for Registrars:

This is in the on-call rooms on Level 1. The key and entry badge is kept in the department office. There are 4 bedrooms and a small sitting room with a television. Cooking facilities are minimal. Meals can be ordered from the hospital canteen (8636) until 7 p.m.

Emergency Equipment- Where is it?

The difficult intubation trolley and Cmac is between theatre 3 &4
The defibrillator and emergency trolley is in recovery
The Malignant Hyperthermia kit is in recovery

Drugs

The anaesthetic carts in each theatre are laid out in a standardised manner.

Fridge drugs are all kept in recovery room.

Controlled drugs are signed out from recovery. Please only sign out for each case as you do them. Please record discarded amounts of controlled drugs, either in the Drug Book, or the anaesthetic record, or both.

Any controlled drugs that are discarded should be thrown into the locked red bins.

The endoscopy theatre has its own drug cupboard and books for signing out.
Appendix 1: Pre-operative assessment

Anaesthetic Pre-Operative Assessment

Help List for Residents & PHOs

Prepared by Dr Hans Muller, Staff Anaesthetist, Redcliffe Hospital, Redcliffe-Caboolture Health Service Anaesthetic Department
June 2000
Reviewed by Dr Simone Malan-Johnson, staff specialist, Caboolture Anaesthetic Department, January 2016

AIM

- To establish if the patient is fit for anaesthesia and the proposed operation, and in the most optimal condition possible in the time available?
- To be informed of specific conditions and risks in order to plan anaesthesia and post-operative care.
- To review medications, and advise the patient how to manage their medications peri-operatively, for example which medications to omit pre-op and for how long.
- To establish a rapport, reassure the patient and answer any questions they may have.

PRE-OPERATIVE QUESTIONNAIRE

- Go through the pre-operative questionnaire with the patient, paying particular attention to any other symptoms, system by system.
- Ask about regular medications, and emphasise to the patient the importance of not skipping any of their regular medicines, including on the day of surgery. Emphasise that even if they are not allowed breakfast, they still need to take the medication with up to half a glass of water. There are a few exceptions to this general rule; Warfarin, Insulin, oral hypoglycaemics, Aspirin, Novel oral anticoagulants (e.g.
Rivaroxaban) glucosamine, Gingko biloba, and garlic can all increase the risk of bleeding. There are specific guidelines for the management of peri-operative warfarin, NOACs, and diabetic medications.

- **Ask about allergies and previous adverse drug reactions**, including any from a previous operation.
- **Ask about previous anaesthetics and operations**, aiming to find out if anything went wrong during the peri-operative period.
- **Ask about smoking, alcohol and recreational drugs**, and advise the patient that it is highly desirable that he/she should not drink or smoke for at least one whole day before coming into hospital.
- **Ask about any recent infections, colds or flu**. It is best to not have an elective operation within 2 weeks of a recent viral/bacterial infection.
- **Ask the patient if he/she has any questions concerning the anaesthetic**. Time spent answering questions and giving reassurance is very important in the management of peri-operative anxiety.

**PRE-OPERATIVE EXAMINATION**
Pay particular attention to the airway, respiratory and cardiovascular systems.

The **airway is examined** as follows:
- mouth opening and ability to protrude the lower teeth in front of the upper teeth to check TMJ function
- the oropharynx is examined through the maximally opened mouth and the degree of visibility of pharyngeal structures is assessed (Mallampatti). This gives an indication of tongue size relative to tongue space
- the range of movement of the cervical spine (both flexion and extension) is assessed;
- the distance between the thyroid notch and the symphysis menti (chin) is assessed by means of the number of finger-breadths (Sternomentale distance; should be at least 4 fingers)
- Are there any loose teeth, dentures, or crowns?
- assess if the mandible looks small and underslung, of if the patient has prominent upper teeth or a protuberant maxilla

If any of the above signs is abnormal, discuss your findings with your Consultant.

**PRE-OPERATIVE INVESTIGATIONS**
See appendix on peri-operative investigations.

All patients scheduled for anything more than minor surgery have a recent Group and Hold ordered (Each G&H is only valid for two weeks). For major cases blood should be crossmatched.

**PRE-MEDICATION**
In Caboolture no anxiolytic premeds are given routinely.
Consider a premed in children, and extremely anxious patients.
If there is a heart murmur, antibiotic prophylaxis needs to be considered.

Informing your patient:
In the majority of cases it is sufficient to explain that a GA involves having a drip, and that the anaesthetic will be injected into the drip, whilst the patient breathes oxygen from a mask. Upon waking he/she will be in recovery and any possible problems (eg. pain, nausea) will be immediately attended to. If the operation is more than minor a PCA may be planned and it is a good idea to spend time explaining to the patient how a PCA works.

Patients having a general anaesthetic should have some explanation given of the likelihood of an LMA: “a tube that goes into the back of the mouth to stop the tongue obstructing their breathing” and/or an Endotracheal tube: “a tube that goes done into their windpipe to look after their breathing”. The possibility of a sensation in their throat post operatively that something has been there should be explained. **A warning of dental damage should be given if there is poor dentition or any possibility of difficult extubation.**

If there is any possibility of a regional procedure the procedure should be presented to the patient with some explanation of advantages eg post operative analgesia, reduced respiratory and cardiovascular complications, lower aspiration risks, as well as possible side effects/complications of the block. The information/consent sheet must be given to the patient.

If a patient requests a particular type of anaesthetic or voices a dislike of a particular type of anaesthetic record it on the anaesthetic sheet, but don’t promise anything. Say something like “the final decision will be up to you and the Anaesthetist looking after you on the day.”

**Document your discussion, including risks mentioned.**

**ASA CLASSIFICATION**

I Healthy patient
II Mild systemic disease, controlled on medication. No functional limitation.
III Severe systemic disease, optimally controlled on medications, but still has some functional limitation.
IV A severe systemic disease that is a constant threat to life.
V A moribund patient who is unlikely to survive 24hrs with or without surgery.
E Any of the above categories undergoing emergency surgery, when the opportunity for preop workup is limited.
Triage guidelines for pre-anaesthetic evaluation at Caboolture Hospital

1. Statement:
Appropriate triage of patients undergoing anaesthesia ensures appropriate investigation, assessment and optimisation 1. Traditional models of assessing all patients by an anaesthetist face to face prior to surgery in many cases is unnecessary, does not lead to better outcomes and may be inconvenient and expensive 2.

2. Purpose and scope:
To provide guidance on the assessment method for patients undergoing elective surgery at Caboolture Hospital excluding patients undergoing gastroenterology endoscopic procedures, obstetric and paediatric patients. All patients undergoing gastroscopy or colonoscopy (i.e. booked by gastroenterology or surgery) should follow criteria on back of Metro-north Gastroenterology Procedure Request Form for referral for anaesthetics review

3. Triage Guidelines for pre-anaesthetic evaluation
It is important to note that all patients will be assessed by an anaesthetist prior to their procedure in line with Australian and New Zealand College of Anaesthetists (ANZCA) recommendations. The purpose of triaging is to decide when and how that assessment should take place (on the day of surgery or prior to the day of surgery).

Prior to the day of surgery, the assessment may be face to face, via telephone when the patient cannot attend the pre-anaesthetic clinic.

4. Related documents
Caboolture perioperative investigations guideline
SWAPNet Triage guideline
SWAPNet Preoperative Investigations Guideline
SWAPNet Pre-anaesthetic Evaluation Framework Implementation Guideline
Adult Integrated Pre-Procedure Screening Tool
ANZCA guidelines on Pre-Anaesthesia Consultation and Patient Preparation (PS07)
Diabetes Australia Best Practice Guidelines

5. The traffic light streaming system:
Use of traffic light streaming system as Triage assessment tool

Red stream: This group of patients requires assessment by an anaesthetist prior to the day of surgery. This may be based on the surgical complexity or patient co-morbidities

Amber stream: This group of patients requires escalation of their triage to the anaesthetist or require further information/investigation prior to a red or green stream being allocated.
Green stream - This group of patients will not require assessment by an anaesthetist prior to the day of surgery.

6. **Clinical information to support triage decision making**

Clinical information to support triage decision making can come from multiple sources:

- Theatre booking forms, clinical information systems - The Viewer, Electronic Discharge Summary, Automated Anaesthetic Record Keeping System (AARK), GP/ Specialist’s summaries, AIPPST

Adult Integrated pre-procedure screening tool (AIPPST) should be completed by the patient when they are booked for surgery. It forms an essential part of the triage process. Failure to complete this documentation may delay triage or lead to inappropriate triage.

7. **Recommendations for specific surgery grades**

<table>
<thead>
<tr>
<th>Surgical grade</th>
<th>Procedures done at Caboolture Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>Excision of skin lesion, Myringotomy tube, Hysteroscopy</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Hernia Repair, Lap cholecystectomy, Surgery on breast except mastectomy</td>
</tr>
<tr>
<td>Major/Complex</td>
<td>Hysterectomy, Thyroidectomy, Colonic resection, Mastectomy</td>
</tr>
</tbody>
</table>

**Major or Complex Surgery**-

Patients undergoing major or complex surgery will be assessed by an anaesthetist prior to the day of surgery. This consultation will allow for risk assessment, optimisation and the discussion of possible anaesthetic techniques and their associated risks.

**List of operations always requiring face to face assessment by an anaesthetist**

- Hysterectomy
- Thyroidectomy
- Colonic resection
- Mastectomy

**Minor and Intermediate surgical severity classifications**

Not all patients undergoing Minor or intermediate surgery need to be seen by an anaesthetist prior to the day of surgery. The Adult Integrated Pre-Procedure Screening Tool provides questions that trigger the need for an assessment by an anaesthetist prior to the day of procedure.

8. **Triaging using Adult Integrated Pre-Procedure Screening Tool**

To enable a patient to progress down the green pathway, they must have answered ‘No’ to all the questions in the AIPPST or ‘Yes’ with a corresponding green pathway response.

Any red response results in the patient entering the red pathway and a booked PAC appointment with an anaesthetist. If a patient ticks ‘yes’ without a corresponding green or red response, they will be
designated as **amber** and require clinical triage by an anaesthetist to determine if they enter the green or red pathway. All amber patients ultimately enter either the red or green pathway.

Patients not requiring assessment by an anaesthetist prior to the day of surgery (Green stream) will be contacted by a member of staff by telephone to

- make sure clinical information provided is correct
- confirm fasting instructions – based on Australian and New Zealand College of Anaesthetist guidelines
- answer any questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Green Pathway</th>
<th>Red Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you, or any of your blood relatives ever had a problem with an anaesthetic</td>
<td>Nausea/Vomiting&lt;br&gt;Low Blood pressure&lt;br&gt;Slow to wake up</td>
<td>Suxamethonium apnoea&lt;br&gt;Malignant Hyperthermia&lt;br&gt;ICU admission&lt;br&gt;Anaphylaxis&lt;br&gt;Difficult airway</td>
</tr>
<tr>
<td>Difficulty swallowing, opening your mouth or moving your neck</td>
<td>Difficulty swallowing</td>
<td>Difficulty opening mouth or moving neck limiting movements</td>
</tr>
<tr>
<td>Difficulty walking up more than two flights of stairs</td>
<td>Difficulty due to leg, back pain</td>
<td>Chest pain or breathlessness at normal speed</td>
</tr>
<tr>
<td>Dentures</td>
<td>Any response</td>
<td></td>
</tr>
<tr>
<td>Loose or chipped teeth</td>
<td>Any response</td>
<td></td>
</tr>
<tr>
<td>High blood pressure</td>
<td>&lt;180/100</td>
<td>&gt;180/100</td>
</tr>
<tr>
<td>Angina</td>
<td>Occasional and controlled with NTG spray, no recent increase in frequency, control supported by cardiologist letter</td>
<td>Weekly or more frequently or increasing frequency</td>
</tr>
<tr>
<td>Arrhythmias or palpitations</td>
<td>Controlled AF, Heart rate less than 100. Controlled palpitations on medications</td>
<td>Uncontrolled AF(HR&gt;100) or uncontrolled cardiac symptoms e.g. chest pain, palpitations, syncope, dyspnoea</td>
</tr>
<tr>
<td>Heart attack</td>
<td>&gt;12 months ago, and can walk 2 flights of stairs</td>
<td>Within 12 months</td>
</tr>
<tr>
<td>Heart surgery/pacemaker / defibrillator inserted</td>
<td>Surgery &gt;12 months ago, and can walk 2 flights of stairs&lt;br&gt;Asymptomatic after Pacemaker/defibrillator and device checked within 6 months</td>
<td>Surgery within 12 months&lt;br&gt;Symptoms e.g. palpitations or syncope even with pacemaker/defibrillator and device not checked within last 6 months</td>
</tr>
<tr>
<td>Other heart problem</td>
<td>Any response- These patients will fall into <strong>AMBER</strong> stream</td>
<td></td>
</tr>
<tr>
<td>Heartburn or acid reflux</td>
<td>Any response</td>
<td></td>
</tr>
<tr>
<td>Liver disease / hepatitis / jaundice</td>
<td>Treated or previous or Mild with normal liver functions</td>
<td>Any other response</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>Treated or previous or mild with normal kidney functions</td>
<td>Other responses e.g. end-stage kidney disease, fluid restriction, on dialysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15.</td>
<td>Blood clots in the legs or lungs</td>
<td>Previous DVT no longer on anticoagulants</td>
</tr>
<tr>
<td>16.</td>
<td>Diabetes</td>
<td>Fasting BSL 6-7 and or Hba1c &lt;8.5</td>
</tr>
<tr>
<td>17.</td>
<td>Asthma</td>
<td>Well controlled, occasional attacks, or no hospital admissions within 3 months</td>
</tr>
<tr>
<td>18.</td>
<td>COPD</td>
<td>Ability to climb 2 flights of stairs and no admission or acute exacerbation within 3 months</td>
</tr>
<tr>
<td>19.</td>
<td>Sleep apnoea</td>
<td>Mild OSA not requiring CPAP or mod to severe and compliant on CPAP</td>
</tr>
<tr>
<td>20.</td>
<td>Stroke or TIA</td>
<td>Not within 6 months and recovered</td>
</tr>
<tr>
<td>21.</td>
<td>Epilepsy</td>
<td>Well controlled and seizure free within 6 months</td>
</tr>
<tr>
<td>22.</td>
<td>Arthritis</td>
<td>Any response except when arthritis limiting jaw or neck movements</td>
</tr>
<tr>
<td>23.</td>
<td>Bleeding, bruising disorder</td>
<td>Mild not on meds</td>
</tr>
<tr>
<td>24.</td>
<td>Anaemia, previous blood transfusion</td>
<td>History of blood transfusion or treated anaemia</td>
</tr>
<tr>
<td>25.</td>
<td>Have you ever smoked tobacco</td>
<td>Any response except heavy smoking with symptoms of wheeze, or acute on chronic productive cough</td>
</tr>
<tr>
<td>26.</td>
<td>Do you drink alcohol</td>
<td>Any response except when liver damage present or other complications</td>
</tr>
<tr>
<td>27.</td>
<td>Do you take recreational party drugs</td>
<td>Occasional user</td>
</tr>
<tr>
<td>28.</td>
<td>Could you be pregnant</td>
<td>No- confirmed on test</td>
</tr>
<tr>
<td>29.</td>
<td>Do you suffer from anxiety, depression other psychiatric disorders</td>
<td>Mild anxiety, depression or psychiatric disorders controlled with or without medications</td>
</tr>
<tr>
<td>30.</td>
<td>Other medical conditions or disability not mentioned</td>
<td>These patients will fall in to amber group</td>
</tr>
</tbody>
</table>

At the time of booking, along with triage, collection of extra clinical information based on patients’ responses on AIPPST to support triage and order of investigations will be done. A separate guideline on perioperative investigations has been created. The information collected will help Anaesthetist in the pre-anaesthetic clinic to plan further and will avoid further delays. Patients falling into red stream should be asked verbally to see their respective doctor (GP or Specialist) for optimization of their condition. The same will be followed up by the anaesthetist in the pre-anaesthetic clinic. Similarly, patients with poor dentition should be asked to see Dentist.
9. **Special circumstances**

Recent anaesthetic-

Patients who have undergone an anaesthetic evaluation for a similar procedure in the last 12 months are unlikely to need a further assessment if their health status has not changed.

Chronic pain patients-

Chronic pain patients on multiple pain medicines are likely to benefit from face to face consultation prior to the day of the procedure.

High BMI patients-

Any patient with BMI>40 will go face to face consultation prior to the day of the procedure.

Recent URTI and LRTI

Patients who have respiratory tract infections producing fever and cough with or without chest signs on auscultation should not undergo elective surgery under GA due to the increased risk of post-operative pulmonary complications.

10. **Clinical references**


(Adapted from SWAPNET guidelines- Dr Hitesh Nischal)
Appendix 3:

Preoperative investigations guideline

1. Statement
Preoperative investigations should not be ordered routinely. Perioperative investigations should be tailored to the individual patient’s needs and the surgery they are undergoing.

2. Purpose
   1. To provide guidance in the management of preoperative investigations
   2. To ensure an individual approach to preoperative management
   3. To reduce unnecessary ordering of tests and investigations where not indicated.

3. Scope
This guideline applies to perioperative testing for all adult patients undergoing elective surgery at Caboolture Hospital. The guideline is based on patient’s co-morbidities and the complexity of the surgical procedure being undertaken.

4. Related documents
Caboolture Triage Guidelines for Pre-anaesthetic Evaluation
SWAPNet Pre-anaesthetic Evaluation Framework Implementation Guideline
SWAPNET Triage Guidelines for Pre-anaesthetic Evaluation
Adult Integrated Pre-Procedure Screening Tool
ANZCA guidelines on Pre-Anaesthesia Consultation and Patient Preparation (PS07)

5. Guideline for pre-operative investigations
Pre-operative evaluation is an important component of the peri-operative management of elective surgery patients and ideally should occur following referral for surgery. Ordering of preoperative tests occurs before surgical procedures to check for conditions that may affect treatment. This can assist the anaesthetist and surgeon to make decisions regarding the course of treatment and pre and / or post-operative management. Perioperative tests can sometimes be ordered unnecessarily, this can cause delays in treatment and inefficiency in planning surgical care. Inappropriate ordering of routine preoperative tests can also lead to high costs of health care.

This guideline covers routine preoperative tests for adults who are having elective surgery. It aims to reduce unnecessary testing by providing guidance on which tests to offer before minor, intermediate and major or complex surgery.

6. Recommendations relevant to all patients

6.1 Pregnancy testing
All women of childbearing age should be sensitively questioned on the day of surgery as to whether there is a possibility that they could be pregnant.

Women who could possibly be pregnant should be informed of the risks and a pregnancy test should be discussed.

Pregnancy tests should be carried out on all women who may be pregnant with their consent. Any relevant discussions should be documented in the clinical notes.

There should be locally agreed policies on the administration and checking of pregnancy tests prior to surgery.
6.2 HBA1c

Should not be carried out on patients without known diabetes.

Should be checked in patients with diabetes HBA1c (if their diabetes is stable) and it hasn’t been checked in the last 6 months.

Should be checked in patients with diabetes HBA1c (if their diabetes is unstable) and it hasn’t been checked in the last 3 months. Stable diabetes is when fasting Blood sugar levels are usually under 7mmols/l

6.3 Chest X-ray

Should not be routinely performed prior to surgery.

6.4 Resting 2D Echocardiography

Should not be ordered routinely.

Recommended in patients with clinically suspected moderate or greater degrees of valvular heart disease as well as known or suspected moderate to severe pulmonary hypertension, if an Echo has not been performed within the past 12 months or a significant change clinical status or physical examination as occurred².

Should be discussed with a medical practitioner before an investigation is ordered.

6.5 Polysomnography/sleep studies

Surgery should not be delayed or cancelled to formally diagnose OSA in patients identified as high risk of OSA preoperatively unless there is evidence of uncontrolled systemic disease or additional problems with ventilation or gas exchange.

Screening tools such as STOP-Bang, P-SAP, Berlin and ASA checklist can be used as preoperative screening tools to identify patients with suspected OSA⁴.

7. Recommendations for specific surgery grades and ASA grades

7.1 Surgical grades

<table>
<thead>
<tr>
<th>Surgical grade</th>
<th>Procedures done at Caboolture Hospital</th>
</tr>
</thead>
</table>
| Minor              | Excision of skin lesion  
                    | Myringotomy tube  
                    | Hysteroscopy  
                    | Endoscopy /colonoscopy (excluded from guidelines) |
| Intermediate       | Hernia Repair  
                    | Lap cholecystectomy  
                    | Surgery on breast except mastectomy |
| Major/Complex      | Hysterectomy  
                    | Thyroidectomy  
                    | Colonic resection  
                    | Mastectomy |
### 7.2 ASA grades

<table>
<thead>
<tr>
<th>ASA Grade</th>
<th>Description</th>
<th>Medical Co-morbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA 1</td>
<td>A normal healthy patient</td>
<td>No medical co-morbidities</td>
</tr>
<tr>
<td>ASA 2</td>
<td>A patient with mild systemic disease</td>
<td>Eg. Controlled hypertension. Diabetes without end organ damage, well controlled asthma</td>
</tr>
<tr>
<td>ASA 3</td>
<td>A patient with severe systemic disease</td>
<td>Eg. Poorly controlled diabetes, Severe COPD, Morbid Obesity, CVA</td>
</tr>
<tr>
<td>ASA 4</td>
<td>A patient with severe systemic disease that is a constant threat to life</td>
<td>Eg. Recent CVA/MI, Severe valvular heart disease,</td>
</tr>
</tbody>
</table>

### 7.3 Minor surgery

<table>
<thead>
<tr>
<th>Test</th>
<th>ASA 1</th>
<th>ASA 2</th>
<th>ASA 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Blood Count</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
</tr>
<tr>
<td>Coagulation Screen</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
</tr>
<tr>
<td>(If clotting status needs to be tested prior to surgery consider using point of care testing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal Function</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>yes in patients at risk of AKI</td>
</tr>
<tr>
<td>ECG</td>
<td>Yes if patient aged over 65 and if no ECG in last 12 Months</td>
<td>Yes if patient aged over 65 and if no ECG in last 12 Months</td>
<td>Yes if no ECG in last 12 months</td>
</tr>
<tr>
<td>Spirometry</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
</tr>
</tbody>
</table>
## 7.4 Intermediate surgery

<table>
<thead>
<tr>
<th>Test</th>
<th>ASA 1</th>
<th>ASA 2</th>
<th>ASA 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Blood Count</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>yes for people with cardiovascular or renal disease if any symptoms not recently investigated</td>
</tr>
<tr>
<td>Coagulation Screen</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>yes in patients with chronic liver disease</td>
</tr>
<tr>
<td>(If clotting status needs to be tested prior to surgery, consider using point of care testing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal Function</td>
<td>Not Routinely</td>
<td>yes in patients at risk of AKI</td>
<td>Yes</td>
</tr>
<tr>
<td>ECG</td>
<td>Yes if patient aged over 65 and if no ECG in last 12 Months</td>
<td>Yes if patient aged over 65 and if no ECG in last 12 Months and in patients aged under 65 with diabetes, cardiovascular or renal comorbidities</td>
<td>Yes</td>
</tr>
<tr>
<td>Spirometry</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>yes only to diagnose respiratory disease if contributing to ASA status</td>
</tr>
</tbody>
</table>


7.5 Major or complex surgery

<table>
<thead>
<tr>
<th>Test</th>
<th>ASA 1</th>
<th>ASA 2</th>
<th>ASA 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Blood Count</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Coagulation Screen</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>Yes in patients with chronic liver disease</td>
</tr>
<tr>
<td>(If clotting status needs to be tested prior to surgery consider using point of care testing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal Function</td>
<td>Yes in patients at risk of AKI</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ECG</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Spirometry</td>
<td>Not Routinely</td>
<td>Not Routinely</td>
<td>Yes only to diagnose respiratory disease if contributing to ASA status</td>
</tr>
</tbody>
</table>

7.6 Patients at risk of AKI

Increased risk of acute kidney injury is associated with:

- Intra peritoneal surgery
- Chronic kidney disease
- Diabetes
- Heart failure
- Age greater than 65
- Liver disease

8. Other

1. Iron studies- part of ERAS, Anaemic pt, surgery for colon cancer
9. Clinical references


3. Routine preoperative tests for elective surgery; NICE Guidelines (April 2016)


Adapted from SWAPNet – Dr Hitesh Nischal
Appendix 4:

Proposed Medication Procedure
Peri-procedural Management of Anticoagulants and Anti-platelets

The information provided in this document is intended to guide best practice for best patient outcomes. Pre-operative medication management should always include risk/benefit analysis accounting for the individual patient and procedure they are having performed.

Purpose and intent
Provide guidelines on the management of patients who are on oral anticoagulant therapy (warfarin, rivaroxaban, apixaban or dabigatran) and/or anti-platelet therapy (aspirin, clopidogrel, ticagrelor, prasugrel, ticlodipine) before and after elective and emergency procedures at Caboolture, Kilcoy Hospitals and Woodford Correctional Centre.

Scope and target audience
All medical, nursing and pharmacy staff at Caboolture, Kilcoy Hospitals and Woodford Correctional Centre.

Procedure / process

Disclaimer
Currently there is very little high quality, evidence-based information on the cessation and resumption of therapeutic anticoagulation in patients undergoing a surgical procedure. The decision to withhold and resume therapeutic anticoagulation in surgical patients should be made on a case-by-case basis in consultation with the surgeon, treating physician, and anaesthetist, with careful consideration of the risk of thromboembolism and bleeding¹.

The decision to withhold or continue antiplatelet therapy should be made on a case-by-case basis. This decision should be guided by the risk of thrombosis which may carry an extreme risk of death or further coronary events, as well as the risk of bleeding, which may carry a risk of paradoxical myocardial ischaemia². In situations where both bleeding and thrombosis risk are high consultation between the surgeon, physician and anaesthetist should occur.
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</thead>
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</tr>
<tr>
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<tr>
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<td>13</td>
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<tr>
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<td>14-15</td>
</tr>
<tr>
<td>Appendix 2 – warfarin instructions</td>
<td>16</td>
</tr>
<tr>
<td>References</td>
<td>17</td>
</tr>
</tbody>
</table>
**Anticoagulants**

**Thromboembolism risk**

Anticoagulants are indicated to reduce the risk of thromboembolism most commonly in patients with prosthetic valves, atrial fibrillation and in those who have previously experienced a venous thromboembolism. Table 1 stratifies patients as high risk, intermediate risk and low risk depending on the indication for their anticoagulation.

In patients who are at high risk of thromboembolism bridging anticoagulation is strongly recommended. In patients at intermediate risk, the decision to use bridging anticoagulation should be made on a case by case basis taking into consideration the risk of thromboembolism and risk of bleeding associated with the surgery. In patients at low risk, bridging is not recommended (For patients with mechanical heart valves consultation with the patient’s cardiologist or cardiac surgeon should occur).

For patients who have a transiently increased risk of thromboembolism delaying surgery should be considered. An example of a patient whose risk of thromboembolism is transiently increased is someone who has experienced VTE during the last 3 months. For these patients, the risks and benefits of proceeding and delaying the procedure should be considered.

For patients whose indication for anticoagulation is not listed in table 1, clinical judgement is required to assess the patient’s risk of thromboembolism.

**Bleeding risk**

Generally, a patient with no risk factors for bleeding, who is having an elective procedure with a low risk of bleeding, can continue warfarin without interruption. Non–vitamin K oral anticoagulant (DOAC) therapy is usually withheld on the day of the procedure.

The periprocedural risk of bleeding is influenced by the location and nature of the procedure, as well as patient-related risk factors for bleeding.

When assessing **procedural bleeding risk**, consider the ability to achieve haemostasis, the likelihood of the procedure causing major bleeding, and the clinical consequence of bleeding should it occur. In Appendix 1, the bleeding risk of procedures commonly performed at Caboolture Hospital have been categorised as high or low risk to assist with assessment of bleeding risk.

Factors that increase the **patient-related bleeding risk** include history of bleeding (particularly if this occurred with a similar procedure), a supratherapeutic international normalised ratio (INR), high alcohol intake, and factors included in risk indices such as the HAS-BLED score (hypertension, abnormal kidney or liver function, prior stroke, history of bleeding, labile INR, age, other drugs). If possible, address correctable patient-related risk factors before proceeding with elective procedures.
Table 1. Risk of a periprocedural thromboembolic event in a patient with a mechanical heart valve, atrial fibrillation or venous thromboembolism

<table>
<thead>
<tr>
<th></th>
<th>High risk of ATE or VTE [NB1]</th>
<th>Intermediate risk of ATE or VTE [NB2]</th>
<th>Low risk of ATE or VTE [NB3]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanical heart valve</strong></td>
<td>any mechanical mitral valve caged ball or tilting disk valve in mitral or aortic position stroke or TIA in the past 6 months</td>
<td>bileaflet mechanical aortic valve with major risk factors for stroke</td>
<td>bileaflet mechanical aortic valve without major risk factors for stroke</td>
</tr>
<tr>
<td><strong>Atrial fibrillation</strong></td>
<td>CHADS₂ score of 5 or 6 [NB5] stroke or TIA in the past 3 months rheumatic valvular heart disease</td>
<td>CHADS₂ score of 3 or 4 [NB5]</td>
<td>CHADS₂ score of 0 to 2 and no prior stroke or TIA [NB5]</td>
</tr>
<tr>
<td><strong>VTE</strong></td>
<td>VTE in the past 3 months severe thrombophilia deficiency of protein C, protein S or antithrombin antiphospholipid antibodies multiple thrombophlias</td>
<td>VTE in the past 3 to 12 months recurrent VTE nonsevere thrombophilia active cancer</td>
<td>VTE more than 12 months</td>
</tr>
<tr>
<td><strong>Bridging</strong></td>
<td>Strongly recommended</td>
<td>On a case by case basis taking into consideration bleeding risk.</td>
<td>Not recommended (for patients with mechanical heart valves consultation with the patient’s cardiologist or cardiac surgeon should occur)</td>
</tr>
</tbody>
</table>

ATE = arterial thromboembolism; TIA = transient ischaemic attack; VTE = venous thromboembolism

NB1: High risk is more than 10% per year risk of ATE, or more than 10% per month risk of VTE.

NB2: Intermediate risk is 4 to 10% per year risk of ATE, or 4 to 10% per month risk of VTE.

NB3: Low risk is less than 4% per year risk of ATE, or less than 2% per month risk of VTE.

NB4: Major risk factors for stroke = atrial fibrillation, previous thromboembolism, hypercoagulable condition, left ventricular ejection fraction <30%, or more than one mechanical valve.

NB5: See table 2 for advice on calculating CHADS₂ score
<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Congestive heart failure*</td>
</tr>
<tr>
<td>H</td>
<td>Hypertension**</td>
</tr>
<tr>
<td>A₂</td>
<td>Age over 75 years</td>
</tr>
<tr>
<td>D</td>
<td>Diabetes</td>
</tr>
<tr>
<td>S₂</td>
<td>Stroke (ischemic), TIA or thromboembolism</td>
</tr>
</tbody>
</table>

*Congestive heart failure - The presence of signs and symptoms of either right or left ventricular failure or both, confirmed by non-invasive or invasive measurements demonstrating objective evidence of cardiac dysfunction. E.g. LVEF < 40%.

**Hypertension – (BP > 140/90 mmHg on two consecutive occasions, history of hypertension in the past 10 years or on pharmacological management.
How to Bridge – for patients on warfarin

Before Surgery

All patients prescribed warfarin must have their renal function checked within two weeks of their perioperative management appointment (and results must be available).

If temporary interruption of warfarin therapy is required, the international normalised ratio (INR) should be less than 1.5 on the day of the procedure, to reduce the risk of bleeding. To achieve an INR of less than 1.5 on the day of the procedure:

- For patients whose target INR is 2-3 stop warfarin 5 days prior to the procedure.
- For patients whose target INR is 2.5-3.5 stop warfarin at least 5 days prior to the procedure.

INR results should be checked two days after stopping warfarin and daily thereafter until INR is no longer therapeutic. When the INR is less 2 or 2.5 (depending on clinical context) bridging therapy should be initiated.

Table 3. Recommended dosage regimens of preprocedural bridging therapy

<table>
<thead>
<tr>
<th>Agent</th>
<th>Renal function (CrCl)</th>
<th>Indication</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enoxaparin (by subcutaneous injection)</td>
<td>Greater than 30mL/min</td>
<td>AF or VTE</td>
<td>1.5mg/kg daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prosthetic heart valves or severe thrombophilia</td>
<td>1mg/kg twice daily</td>
</tr>
<tr>
<td>Unfractionated heparin (by intravenous infusion)</td>
<td>Less than 30mL/min</td>
<td>All indications</td>
<td>As per QH IV heparin nomogram</td>
</tr>
</tbody>
</table>

For all patients whose warfarin is stopped pre-operatively a ‘warfarin instructions’ document must be completed during preadmission anaesthetic clinic (See Appendix 2).

These ‘warfarin instructions’ must be given to the patient and a copy should be stored in the medical record. For patients being bridged with subcutaneous enoxaparin all sections of the ‘warfarin instructions’ document must be completed.

For patients who don’t require bridging therapy and for patients being bridged with intravenous heparin only the lines labelled ‘Before your procedure, take your last dose of warfarin before your procedure on…’, ‘Do not take warfarin on…’ and ‘Present to hospital on…’ must be completed. Patients undergoing bridging with intravenous heparin should be bridged as per this procedure. If an alternative plan is preferred by the surgeon/proceduralist, anaesthetist and cardiologist/cardiac surgeon then this should be documented in the medical record.

When considering the use of enoxaparin for bridging it is important to take in to account the patient’s comorbidities, body weight, ability to self-administer and monitoring requirement (Table 4).

Pre-operative bridging in high thrombotic risk individuals with enoxaparin and heparin are outlined in Tables...
5A and 5B respectively\textsuperscript{4}. Low thrombosis risk requires no bridging and the management of warfarin is outlined in Table 6\textsuperscript{4}.

<table>
<thead>
<tr>
<th>Table 4. Special Considerations for Enoxaparin Bridging Therapy\textsuperscript{4,9}</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Where active or remote history of heparin-induced thrombocytopenia, do not use heparin or low molecular weight heparin. Seek haematology advice.</td>
</tr>
<tr>
<td>• Enoxaparin should not be used in severe renal impairment (i.e. CrCl 30mL/min or less).</td>
</tr>
<tr>
<td>• Use actual body weight to calculate enoxaparin dosage (rounded down to the nearest 10kg). For patients with extremes of body weight (i.e. less than 50kg or BMI greater than 35kg/m\textsuperscript{2}) or where calculated dose is greater than 100mg BD, UFH is recommended instead of LMWH.</td>
</tr>
<tr>
<td>• Assess the patient’s ability to self-administer enoxaparin as an outpatient, or make sure they are able to arrange with a carer, GP or community services to administer enoxaparin.</td>
</tr>
<tr>
<td>• Consider monitoring the level of anti-factor Xa (blood taken at 4 hours post dose) during bridging therapy to ensure appropriate dosing in high risk patients, i.e. those with moderate renal impairment (CrCl 30 – 50mL/min) or who are obese or morbidly obese.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 5A. Pre-operative Bridging with Subcutaneous Enoxaparin in High Risk Patients\textsuperscript{3,4}</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-op Day 6</strong></td>
</tr>
<tr>
<td>Last dose of warfarin</td>
</tr>
<tr>
<td>Check INR - if sub therapeutic, start enoxaparin</td>
</tr>
<tr>
<td>Enoxaparin should be stopped 24 hours before surgery</td>
</tr>
<tr>
<td>If INR above 1.5, notify surgeon</td>
</tr>
</tbody>
</table>
### Table 5B: Pre-operative Bridging with IV Heparin Infusion in High Risk Patients\(^3,4\)

<table>
<thead>
<tr>
<th>Pre-op Day 6</th>
<th>Pre-op Day 5</th>
<th>Pre-op Day 4</th>
<th>Pre-op Day 3</th>
<th>Pre-op Day 2</th>
<th>Pre-op Day 1</th>
<th>Day of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last dose of warfarin</td>
<td>No warfarin</td>
<td>Admit patient Check INR - if sub therapeutic, start heparin IV</td>
<td>Check INR if sub therapeutic, start IV heparin</td>
<td>Start heparin IV if not already done so Continue to monitor INR</td>
<td>Continue heparin IV</td>
<td>Stop heparin IV infusion 4-6 hours before surgery Check INR If INR above 1.5, notify surgeon</td>
</tr>
</tbody>
</table>

### Table 6: Recommendation for Low Risk Patients on Warfarin\(^4\)

1. If usual target INR 2 – 3, stop warfarin on Day 5 pre-op.
2. Check INR on the day of operation; notify the surgeon if INR is greater than 1.5.

**After surgery\(^1,3-6,8,9\)**

Unless contraindicated, apply VTE prophylaxis if clinically indicated until therapeutic anticoagulation is established according to Caboolture and Kilcoy Hospitals Procedure ‘Venous Thromboembolism (VTE) Prophylaxis for Adult Inpatients’\(^11\).

All patients who required bridging prior to their procedure should be bridged after surgery until their INR is greater than 2. For patients who require bridging, the dose the patient was receiving prior to the procedure (if it was appropriate) should be initiated 24-48 hours post procedure if haemostasis is satisfactory. Patients receiving intravenous heparin for bridging should not receive a bolus dose when the infusion is restarted.

As a general rule, therapeutic anticoagulation can be restarted 24 hours after low risk bleeding procedures and 48 hours after high risk bleeding procedures. **The final decision on the appropriate time frame to re-initiate therapeutic anticoagulation should be made at the discretion of the treating team.** Documentation of the plan to re-initiate anticoagulation should be included in the medical record in the days post procedure.

Continue therapeutic heparin or enoxaparin until INR is above 2 or otherwise specified by the treating team, then cease heparin or enoxaparin.

For all patients, warfarin should be restarted on day 1 post procedure unless the patient is bleeding or nil by mouth. Restart on pre-operative warfarin maintenance dose, if it was appropriate. Do not reload. Monitor INR daily and manage warfarin dosing as per the Statewide Guidelines for anticoagulation using warfarin - adult\(^12\).
How to Bridge – for patients on DOACs (Direct Oral Anticoagulants)

Management of factor Xa inhibitors and dabigatran during the perioperative period is discussed in two state wide guidelines:

**Factor Xa inhibitors (PDF 292 kB)**—Guideline for managing patients on a factor Xa inhibitor - Apixaban (Eliquis) or Rivaroxaban (Xarelto)

**Dabigatran (PDF 416 kB)**—Guidelines for Managing Patients on Dabigatran (Pradaxa) Who Present to Hospital

These guidelines should be followed to manage patients on these agents.

For patients undergoing elective surgery serum creatinine must be checked in the two weeks prior to attending preadmission anaesthetic clinic and the results should be made available during clinic to aid clinical decision making.

These state wide guidelines don’t outline how to assess bleeding risk and so for advice regarding bleeding risk associated with common procedures at Caboolture hospital see Appendix 1.
Anticoagulants and Emergency Surgery

Warfarin: patients on warfarin who require emergency surgery are categorised into one of two groups: patients with no active bleeding or patients with life threatening bleeding. In patients requiring immediate reversal where there is no active bleeding, prothombinex-VF can be given (dosing as above). Most cases can be reversed without the need for fresh frozen plasma. If prothombinex is unavailable then prescribe FFP 15ml/kg. In patients with life-threatening bleeding administer prothombinex-VF 50IU/kg, Vitamin K 5-10mg IV and FFP 150 to 300mL. If prothombinex-VF is unavailable then increase FFP to 15mL/kg.

Heparin: Waiting four to six hours is preferable, however in the case of urgent surgery reversal with protamine sulphate may be required.

Low molecular weight heparins: Waiting up to twelve hours is preferable, however in the case of urgent surgery with some benefit will be gained with partial reversal by protamine sulphate.

Dabigatran: in the presence of dabigatran should be delayed until at least 48 hours if possible. In the presence of bleeding haematology advice should be sought. Management may include:

- Oral charcoal if within 2 hours of last dose
- Tranexamic acid IV 15mg/kg followed by an infusion of 1mg/kg/hr
  - Idarucizumab as guided by on call haematology
- Factor 7a (50 mcg/kg) with a repeated dose in the case of severe haemorrhage
- Haemodialysis
  - Can remove up to 60% of plasma dabigatran

Rivaroxaban and Apixaban: surgery should be delayed until 48hrs since the last dose has elapsed. In the presence of significant bleeding the following should be performed:

- FBC, renal function, crossmatch and coagulation studies
- Activated charcoal if within 2 hours of ingestion
- Aggressive fluid replacement as both agents are renally excreted
- Platelet infusion if platelet count <70x10^9/mL
- In severe bleeding consider: prothrombinex 50 IU/kg, tranexamic acid 1g followed by infusion of 1mg/kg/hr and factor 7 50mcg/kg, which may be repeated
- Dialysis is not helpful
Antiplatelets\textsuperscript{15-18}

Antiplatelet cessation is a decision made on the basis of thrombosis risk. Each agent has its own unique indications and cessation times (Figure 1). In the context of a recent thrombotic event (less than 12 months), discussion with the treating physician is recommended.

**Figure 1 Flow-chart describing peri-operative management of anti-platelets**

For most patients who have undergone PCI longer than 12 months ago dual anti-platelets are usually no longer indicated. Advice from the patient’s cardiologist regarding indefinite cessation of the second antiplatelet agent should be sought.

For patients on single agent ticagrelor, clopidogrel, prasugrel, ticlopidine these agents should be ceased as per the above flow diagram and replaced with aspirin (if aspirin is not contraindicated).
Antiplatelet agents and Emergency Surgery

Only after 48-72 hours post irreversible APA cessation will a clinically significant improvement in platelet function be seen. The extent of dysfunction caused by APAs can be measured through platelet function tests. If platelet function is greater than 50%, surgical bleeding as a result of platelet dysfunction is unlikely. In the event of emergency surgery being required prior to this time or in the presence of excessive bleeding secondary to APA, both platelet transfusion and factor 7a supplementation have shown clinical efficacy.
ROTEM guided management of critical bleeding

For the use of ROTEM for the management of critical bleeding in the presence of anticoagulant or antiplatelet agents the normal treatment algorithm is recommended. ROTEM is not useful for the therapeutic monitoring of heparin, LMWH, heparinoids, or NOACs. The ROTEM may be abnormal but does not correlate with therapeutic or over-coagulation. The Townsville Hospital Intensive Care Unit: ROTEM introductory package (PDF 1MB)

Criteria: patients with haemorrhage and haemodynamic instability for whom a MTP (massive transfusion protocol) is activated e.g. major trauma, ruptured AAA, obstetric haemorrhage

Sample collection: Blue top citrate tube (labelled at bedside) delivered to ICU

**Do not treat patient unless clinically significant bleeding**

Physiological targets: temp ≥ 36  pH ≥ 7.2  iCa ≥ 1mmol/L  Hb >70g/L

Consider intraoperative cell saver (HEPTEM required when heparin in cell saver)

---

### Step One

- **FIBTEM A10 ≤톤10mm** (Obstetric ≤12mm)
  - Low fibrinogen

- **Critical bleeding: FIBTEM A10 < 8mm** (Obstetric ≤10mm)
  - Critically low fibrinogen

### Step Two

- **FIBTEM A10 ≥ 10mm + EXTEM A10 ≤40mm**
  - Poor platelet contribution

### Step Three

- **FIBTEM A10 ≥ 10mm + EXTEM CT >90 sec**
  - Low coagulation factors

### Step Four

- **EXTEM ML >15%**
  - Hyperfibrinolysis

Targets:
- **FIBTEM A10 ≥ 15mm**
- **EXTEM A10 > 50mm**
- **EXTEM CT > 60 sec**

### Cryoprecipitate 1U/kg
- Apheresis cryo: 1U/10kg (factors I, VIII, XIII, VWF)

### Two consultant approval:
- Fibrinogen conc/RiaSta (factor only): 1g/25kg
- Alternative: Cryo 20U

### Platelets 1 pooled bag (10ml/kg)

### FFP 2-4U (15ml/kg) or Prothrombinex 12.5U/kg
- (contains only factors II, IX, X, VII)

### Tranexamic acid 1g
- (or 15mg/kg)

---

Special situations: Warfarin – Prothrombinex 25-50U/kg, Vitamin K 5-10mg IV
- Heparin (compare INTEM & HEPTEM) – protamine
- ROTEM is not used to detect or monitor direct thrombin inhibitors, warfarin, LMWH, von Willebrand disease, Gpiib/iii or other platelet inhibitors (e.g. aspirin) due to low sensitivity to these agents.

Repeat ROTEM test 10 minutes after therapy
Appendix 4a - Patient Risk Stratification for bleeding based on procedure type

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Bleeding risk*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gynecological Procedures</td>
<td></td>
</tr>
<tr>
<td>Vaginal hysterectomy</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic sterilisation</td>
<td>High</td>
</tr>
<tr>
<td>Sterilisation by open abdominal approach</td>
<td>High</td>
</tr>
<tr>
<td>Manual removal of placenta</td>
<td>High</td>
</tr>
<tr>
<td>Salpingectomy, bilateral</td>
<td>High</td>
</tr>
<tr>
<td>Sacrospinous colpopexy</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic salpingectomy, bilateral</td>
<td>High</td>
</tr>
<tr>
<td>Repair of anterior and posterior vaginal compartment, vaginal approach</td>
<td>High</td>
</tr>
<tr>
<td>Total laparoscopic abdominal hysterectomy</td>
<td>High</td>
</tr>
<tr>
<td>Repair of posterior vaginal compartment, vaginal approach</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic ovarian cystectomy, unilateral</td>
<td>High</td>
</tr>
<tr>
<td>Excision of lesion of pelvic cavity</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic salpingectomy with removal of tubal pregnancy</td>
<td>High</td>
</tr>
<tr>
<td>Emergency lower segment caesarean section</td>
<td>High</td>
</tr>
<tr>
<td>Elective lower segment caesarean section</td>
<td>High</td>
</tr>
<tr>
<td>Diagnostic hysteroscopy</td>
<td>Low</td>
</tr>
<tr>
<td>Dilation &amp; curettage of uterus [D&amp;C]</td>
<td>Low</td>
</tr>
<tr>
<td>Insertion of intrauterine device [IUD]</td>
<td>Low</td>
</tr>
<tr>
<td>Endoscopic destruction procedures on uterus</td>
<td>Low</td>
</tr>
<tr>
<td>Cystoscopy</td>
<td>Low</td>
</tr>
<tr>
<td>Suction curettage of uterus</td>
<td>Low</td>
</tr>
<tr>
<td>Gynaecological examination</td>
<td>Low</td>
</tr>
<tr>
<td>Dilation of cervix</td>
<td>Low</td>
</tr>
<tr>
<td>Curettage of uterus without dilation</td>
<td>Low</td>
</tr>
<tr>
<td>Removal of intrauterine device [IUD]</td>
<td>Low</td>
</tr>
<tr>
<td>Large loop excision of transformation zone [LLETZ]</td>
<td>Low</td>
</tr>
<tr>
<td>Polypectomy of uterus via hysteroscopy</td>
<td>Low</td>
</tr>
<tr>
<td>Papanicolaou smear study</td>
<td>Low</td>
</tr>
<tr>
<td>Myringotomy with insertion of tube, bilateral</td>
<td>Low</td>
</tr>
<tr>
<td>Sling procedure for stress incontinence, female</td>
<td>Low</td>
</tr>
<tr>
<td>General Surgical Procedures</td>
<td></td>
</tr>
<tr>
<td>Repair of umbilical hernia</td>
<td>High</td>
</tr>
<tr>
<td>Repair of inguinal hernia, unilateral</td>
<td>High</td>
</tr>
<tr>
<td>Exploratory laparotomy</td>
<td>High</td>
</tr>
<tr>
<td>Division of abdominal adhesions</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic repair of inguinal hernia, unilateral</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic division of abdominal adhesions</td>
<td>High</td>
</tr>
<tr>
<td>Repair of incisional hernia</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic repair of inguinal hernia, bilateral</td>
<td>High</td>
</tr>
<tr>
<td>Gastrectomy or fundoplication procedure</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopic cholecystectomy and intraoperative cholangiogram (IOC)</td>
<td>High</td>
</tr>
<tr>
<td>Procedure</td>
<td>Risk</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Laparoscopic appendicectomy</td>
<td>High</td>
</tr>
<tr>
<td>Incision and drainage of abscess of skin and subcutaneous tissue</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of soft tissue, not elsewhere classified</td>
<td>Low</td>
</tr>
<tr>
<td>Anorectal examination</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of breast</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of skin and subcutaneous tissue of other site</td>
<td>Low</td>
</tr>
<tr>
<td>Haemorrhoidectomy</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of skin and subcutaneous tissue of other site of head</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lymph node of axilla</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of skin and subcutaneous tissue of ear</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of skin and subcutaneous tissue of leg</td>
<td>Low</td>
</tr>
<tr>
<td>Incision and drainage of abscess of soft tissue</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of skin and subcutaneous tissue of neck</td>
<td>Low</td>
</tr>
<tr>
<td>Rubber band ligation of haemorrhoids</td>
<td>Low</td>
</tr>
<tr>
<td>Excision of lesion of skin and subcutaneous tissue of nose</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Dental Procedures</strong></td>
<td></td>
</tr>
<tr>
<td>Sectional removal of unspecified number of teeth or root canal</td>
<td>Low</td>
</tr>
<tr>
<td>Radiography of teeth</td>
<td>Low</td>
</tr>
<tr>
<td>Comprehensive oral examination</td>
<td>Low</td>
</tr>
<tr>
<td>Adhesive restoration of posterior tooth, 1 surface, direct</td>
<td>Low</td>
</tr>
<tr>
<td>Removal of calculus from surfaces of teeth</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Where do these fit?</strong></td>
<td></td>
</tr>
<tr>
<td>Fibreoptic colonoscopy to caecum</td>
<td>Low</td>
</tr>
<tr>
<td>Suture of first or second degree tear of perineum</td>
<td>Low</td>
</tr>
<tr>
<td>Spinal injection of other or combined therapeutic substance(s)</td>
<td>High</td>
</tr>
<tr>
<td>Suture of third or fourth degree tear of perineum</td>
<td>High</td>
</tr>
<tr>
<td>Spinal injection of local anaesthetic</td>
<td>High</td>
</tr>
<tr>
<td>Laparoscopy</td>
<td>High</td>
</tr>
</tbody>
</table>

*High bleeding risk= 2 day haemorrhage risk of >1.5%; Low risk= 2 day haemorrhage risk of <1.5%

The above list represents procedures at Caboolture Hospital that account for 80% of surgeries conducted at the hospital.

**Other surgeries where bleeding risk must be considered:**
- Total Thyroidectomy
- GI Endoscopy procedures?
Appendix 4b

Warfarin instructions

Patient details

URN
Family name:
Given name(s):
Address:
Date of birth:

Before your procedure, take your last dose of warfarin on: ……./……/………… (date)

Do not take warfarin on:……./……/………… ("rest day" date)

Have daily INR blood tests starting on ……./……/………… (date) until your INR is less than ……….. (bottom end of INR target range) then start ………………………………. (medicine)

Dosing instructions:

Take your last dose of ……………………… (medicine) on ……./……/………… (date) in the morning

Present to hospital on: ……./……/…………

☐ INR blood forms given to patient for blood tests pre-operatively (given to patient)

Notes:

Signed:……………………….


References

1. UpToDate. ‘Perioperative management of patients receiving anticoagulants’
2. Perioperative Ischemic Evaluation 2
3. TG. ‘General principles of periprocedural management of antithrombotic therapy’
4. TPCH procedure. ‘Medication – Peri-procedural Management of Anticoagulants’
5. 2017 AHA/ACC Focused update on the 2014 AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease’
6. UpToDate. ‘antithrombotic therapy for prosthetic heart valves: management of bleeding and invasive procedures’
7. (Per https://chadsvasc.org/)
8. PAH guideline. Chapter 17: DRUG USE IN SURGERY
9. QH guideline. ‘Guideline for Anticoagulation and Prophylaxis Using Low Molecular Weight Heparin (LMWH) in Adult Inpatients’
12. QH guideline. ‘Guidelines for Anticoagulation using Warfarin – Adult’
13. QH guideline. ‘Guideline for managing patients on a factor Xa inhibitor – Apixaban (Eliquis®) or Rivaroxaban (Xarelto®)’
14. QH guideline. ‘Managing patients on dabigatran (Pradaxa®)’
15. TPCH procedure. ‘Medication – Pre-operative Medication Management’
16. UpToDate. ‘Noncardiac surgery after percutaneous coronary intervention’
17. ‘2016 ACC/AHA Guideline Focused Update on Duration of Dual Antiplatelet Therapy in Patients With Coronary Artery Disease’
18. ‘2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS’
### ASGE guidelines on anticoagulation for endoscopic procedures

#### Condition risk for thromboembolism

<table>
<thead>
<tr>
<th>Procedure risk</th>
<th>Condition risk for thromboembolism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>Discontinue warfarin 3 to 5 days before procedure. Consider herapin while INR is below therapeutic level. Discontinue warfarin 3 to 5 days before procedure. Reinstitute warfarin after procedure.</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>No change in anticoagulation. Elective procedures should be delayed while INR is in supratherapeutic range.</td>
</tr>
</tbody>
</table>

#### Procedure risk

<table>
<thead>
<tr>
<th>Procedure risk</th>
<th>High-risk procedures</th>
<th>Low-risk procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypectomy</td>
<td>Diagnostic (EGD ± biopsy, Flex sig ± biopsy)</td>
<td>ERCP without sphincterotomy</td>
</tr>
<tr>
<td>Biliary sphincterotomy</td>
<td>Biliary/pancreatic stent without endoscopic sphincterotomy</td>
<td></td>
</tr>
<tr>
<td>Pneumatic or bougie dilation</td>
<td>Endosonography without fine needle aspiration</td>
<td></td>
</tr>
<tr>
<td>PEG placement</td>
<td>Laser ablation and coagulation</td>
<td>Treatment of varices</td>
</tr>
<tr>
<td>Endosonographic guided fine needle aspiration</td>
<td></td>
<td>Enteroscopy</td>
</tr>
</tbody>
</table>

#### Condition risk

<table>
<thead>
<tr>
<th>Condition risk</th>
<th>High-risk conditions</th>
<th>Low-risk conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial fibrillation associated with valvular heart disease</td>
<td>Deep vein thrombosis</td>
<td>Uncomplicated or paroxysmal</td>
</tr>
<tr>
<td>Mechanical valve in the mitral position</td>
<td>nonvalvular atrial fibrillation</td>
<td>Bioprosthetic valve</td>
</tr>
<tr>
<td>Mechanical valve and prior thromboembolic event</td>
<td></td>
<td>Mechanical valve in the aortic position</td>
</tr>
</tbody>
</table>

**Aspirin and other NSAID use**

In the absence of a pre-existing bleeding disorder, endoscopic procedures may be performed in patients taking aspirin or other NSAIDs.

---

## Appendix 5: Factor Xa Inhibitors

<table>
<thead>
<tr>
<th>Factor Xa inhibitor</th>
<th>TGA approved indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixaban</td>
<td>Prevention of venous thromboembolism (VTE) in adult patients who have undergone elective total hip or total knee replacement surgery</td>
</tr>
<tr>
<td></td>
<td>Prevention of stroke and systemic embolism in patients with non-valvular atrial fibrillation and at least one additional risk factor for stroke</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>Prevention of VTE in adult patients who have undergone major orthopaedic surgery of the lower limbs (elective total hip, treatment for up to 5 weeks; elective total knee replacement, treatment for up to 2 weeks)</td>
</tr>
<tr>
<td></td>
<td>Treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE) and for the prevention of recurrent DVT and PE</td>
</tr>
<tr>
<td></td>
<td>Prevention of stroke and systemic embolism in patients with non-valvular atrial fibrillation and at least one additional risk factor for stroke</td>
</tr>
</tbody>
</table>

### Dosage of apixaban for different levels of renal function

<table>
<thead>
<tr>
<th>Indication</th>
<th>VTE prevention in total hip replacement (THR) and total knee replacement (TKR)</th>
<th>Stroke prevention in atrial fibrillation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine clearance ↓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater than or equal to 30 mL/min</td>
<td>2.5 mg twice a day 32–38 days for THR 10–14 days for TKR</td>
<td>5 mg twice a day OR 2.5 mg twice a day in patients with at least two of the following characteristics: greater than or equal to 80 years body weight less than or equal to 60 kg serum creatinine greater than or equal to 133 micromol/L</td>
</tr>
<tr>
<td>Less than 30 mL/min</td>
<td>Apixaban is contraindicated</td>
<td></td>
</tr>
</tbody>
</table>
Dosage of rivaroxaban for different levels of renal function

<table>
<thead>
<tr>
<th>Creatinine clearance ↓</th>
<th>VTE prevention in total hip replacement (THR) and total knee replacement (TKR)</th>
<th>Stroke prevention in atrial fibrillation</th>
<th>Treatment of DVT and PE and prevention of recurrent DVT and PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than or equal to 50 mL/min</td>
<td>10 mg once daily Five weeks for THR Two weeks for TKR</td>
<td>20 mg once daily</td>
<td>15 mg twice daily for three weeks, followed by 20 mg once daily</td>
</tr>
<tr>
<td>30–49 mL/min</td>
<td>10 mg once daily Five weeks for THR Two weeks for TKR</td>
<td>15 mg once daily</td>
<td>15 mg twice daily for three weeks, followed by 20 mg once daily</td>
</tr>
<tr>
<td>15–29 mL/min</td>
<td>10 mg once daily <strong>Use with caution</strong></td>
<td>Rivaroxaban is contraindicated</td>
<td></td>
</tr>
<tr>
<td>Less than 15 mL/min</td>
<td>Rivaroxaban is contraindicated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Monitoring / Pathology testing**

There is variable and limited ability to measure factor Xa inhibitor levels in Queensland Health facilities. This is a rapidly changing area and local advice should be sought on availability of relevant coagulation tests and their sensitivity to the effect of the specific factor Xa inhibitor being taken. Monitoring with INR cannot be used. APTT is prolonged, dose-dependent; however, because of reagent insensitivity or nonlinearity it is not recommended to assess the effect of factor Xa inhibitors. A normal thrombin clot time is expected with the presence of factor Xa inhibitors.

The Prothrombin Time (PT) cannot be used to completely exclude the presence of a factor Xa inhibitor and is not useful for monitoring or dose adjustment. Usually, a normal PT (12–15 seconds) excludes the presence of therapeutic factor Xa inhibitor levels. However, the PT can also be influenced by concomitant use of other anticoagulants and vitamin K deficiency.

Factor Xa inhibitors can be assayed using anti-factor Xa testing if set up correctly for the specific medication. Consult with Haematology Service to confirm if anti-factor Xa tests specific for the factor Xa inhibitor taken by the patient are available at your facility.

Routine testing for the effect of factor Xa inhibitors is generally not conducted during treatment because they have predictable pharmacokinetic profiles, enabling fixed-dose regimens. In the following situations laboratory testing may be helpful in assessing patients on factor Xa inhibitors; however, there is limited evidence to guide interpretation of these concentrations:
- the peri-operative setting
- acute coronary syndrome (ACS)
- in the event of bleeding or recurrent thrombosis
- elderly patients due to a higher risk of bleeding
- when hepatic or renal function is deteriorating or if renal impairment with CrCl less than 30 mL/min
- when parenteral anticoagulants are being considered for a patient taking a factor Xa inhibitor
- patients with extremes of body weight because low body weight has a high bleeding risk and obesity may have poor efficacy
- patients on potentially interacting medications (i.e. concomitant administration of strong inducers or inhibitors of CYP3A4 or P-glycoprotein)
- in case of overdose or if there are concerns about compliance.
Management peri-operatively of patients admitted to hospital on a factor Xa inhibitor

Semi-acute or elective surgery
Assess the risk of bleeding against the risk of thrombosis as factor Xa inhibitors may not need to be discontinued for minor procedures.

If the factor Xa inhibitor needs to be withheld, plan ahead as there is no known treatment available for immediate reversal.

Factor Xa inhibitors have predictable pharmacokinetics, a relatively short half-life and a rapid onset of action after oral administration so bridging with another anticoagulant is not required when discontinued before or initiated after surgery.

As factor Xa inhibitors undergo both hepatic and renal excretion, hepatic function and renal function will determine the withholding time prior to surgery and this should be checked pre-admission. The patient should be advised when to withhold their medication pre-operatively. In situations where complete haemostasis is required, APTT, PT and anti-factor Xa should be checked pre-operatively.

Discontinuation of factor Xa inhibitor

<table>
<thead>
<tr>
<th>Renal function (CrCl, mL/min)</th>
<th>Half-life (hours)</th>
<th>Minimum time frame to withhold factor Xa inhibitor prior to surgery after last dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than or equal to 50 mL/min</td>
<td>Apixaban: 8–15</td>
<td>Low bleeding risk&lt;sup&gt;Ψ&lt;/sup&gt; 3 days High bleeding risk&lt;sup&gt;Ψ&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Rivaroxaban: 5–9 (11–13 if elderly)</td>
<td></td>
</tr>
<tr>
<td>Less than 50 mL/min</td>
<td>Apixaban: unknown</td>
<td>3 days</td>
</tr>
<tr>
<td></td>
<td>Rivaroxaban &gt;9</td>
<td>4 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hepatic function (Child-Pugh Score)</th>
<th>Half-life (hours)</th>
<th>Minimum time frame to withhold factor Xa inhibitor prior to surgery after last dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild impairment (Child-Pugh A)</td>
<td>Apixaban: unknown</td>
<td>Low bleeding risk&lt;sup&gt;Ψ&lt;/sup&gt; 1 day 2 days High bleeding risk&lt;sup&gt;Ψ&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Rivaroxaban: 8</td>
<td></td>
</tr>
<tr>
<td>Moderate impairment (Child-Pugh B)</td>
<td>Apixaban: unknown</td>
<td>At least 2 days  At least 4 days</td>
</tr>
<tr>
<td></td>
<td>Rivaroxaban: 12–16</td>
<td></td>
</tr>
<tr>
<td>Severe impairment (Child-Pugh C)</td>
<td>Unknown</td>
<td>5 days  At least 7 days</td>
</tr>
</tbody>
</table>

<sup>Ψ</sup> Examples of surgery associated with low risk of bleeding include electrophysiology procedures, cardiac catheterisations, surgery with no additional patient-specific risk factors.

<sup>Ψ</sup> Examples of surgery associated with high risk of bleeding include surgery involving a major organ, procedures requiring complete haemostasis (e.g. spinal anaesthesia) or when additional risk factors for bleeding are present (e.g. advancing age, co-morbidities such as major cardiac, respiratory or liver disease, and concomitant use of anti-platelet therapy).

Urgent surgery

Stop factor Xa inhibitor.

- Check full blood count, electrolytes (including calcium), renal function and coagulation screen (APTT, PT, anti-factor Xa and fibrinogen assay); indicate time of last factor Xa inhibitor dose on request form.

- Consider delaying surgery, if appropriate, until coagulation screen is normal or until sufficient time for drug clearance (see above).

Where urgent life-saving surgery cannot be delayed, consult with Haematology Service over measures to control bleeding perioperatively.

Epidural and spinal anaesthesia are contraindicated.
Cross-match blood.

**Recommendations regarding epidural and spinal catheter**
- Epidural and spinal anaesthesia are contraindicated unless factor Xa inhibitors have been eliminated as indicated by the absence of anti-factor Xa activity (i.e. anti-factor Xa level of zero) or sufficient time for drug clearance (see high bleeding risk above).
- Factor Xa inhibitors should not be recommenced in patients who have an epidural or spinal catheter in place.
- Factor Xa inhibitors should not be restarted within 24 hours of removal of spinal or epidural catheter; a longer delay should be considered if there are multiple punctures or traumatic insertion of spinal or epidural catheter.

**Restarting factor Xa inhibitors after surgery**
The timing of recommencement of therapy is based on the nature of surgery, haemostatic state and urgency of restarting anticoagulant therapy. In complicated cases, seek specialist advice.
- Do not restart a factor Xa inhibitor in severe renal impairment (i.e. CrCl equal to or less than 30 mL/min).
- Do not restart a factor Xa inhibitor in severe hepatic impairment (i.e. Child-Pugh C).
- In general, Table E provides a guide to the timing for restarting factor Xa inhibitors after surgery.
- If haemostasis is not satisfactory and clinically significant bleeding is present, a delay in restarting a factor Xa inhibitor is appropriate.
- Consider using an alternative short acting and reversible anticoagulant (e.g. unfractionated heparin) if the risk of thrombosis is greater than the risk of wound bleeding.

<table>
<thead>
<tr>
<th>Factor Xa inhibitor</th>
<th>Suggested timing for restarting factor Xa inhibitor after surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low bleeding risk surgery</td>
</tr>
<tr>
<td>Apixaban</td>
<td>Resume 24 hours after surgery</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td></td>
</tr>
</tbody>
</table>

**Venous Thromboembolism (VTE) prophylaxis**
Do not commence pharmacological VTE prophylaxis (e.g. heparin, dalteparin, enoxaparin) if patient is taking a factor Xa inhibitor. If a factor Xa inhibitor is ceased, and VTE prophylaxis is indicated, start pharmacological prophylaxis when coagulation screen is normal or sufficient time has elapsed for drug clearance (Summarised from Department of Health: Guideline for managing patients on a factor Xa inhibitor)
## APPENDIX 6: PCA Guidelines

<table>
<thead>
<tr>
<th>Opioid</th>
<th>Concentration</th>
<th>Dose Range</th>
<th>Background</th>
<th>Lock out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>1 mg / ml</td>
<td>&lt; 65 – 1-2 mg</td>
<td>Not Recommended</td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 65 – 1 mg</td>
<td>Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Oxycodone</td>
<td>1mg / ml</td>
<td>1-2mg</td>
<td>Not recommended</td>
<td>5 Minutes</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>20 mcg / ml</td>
<td>20 – 40 mcg</td>
<td>0 – 40 mcg *</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Tramadol</td>
<td>10 mg / ml</td>
<td>20 mg</td>
<td>Not Recommended</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Pethidine</td>
<td>10mg / ml</td>
<td>10 mg</td>
<td>Not Recommended</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Remifentanil</td>
<td>20mcg :1ml</td>
<td>10 – 40 mcg</td>
<td>Not Recommended **</td>
<td>2-3 minute</td>
</tr>
</tbody>
</table>

## PCEA Guidelines

<table>
<thead>
<tr>
<th>Solution</th>
<th>Additive</th>
<th>PCEA Dose</th>
<th>Background</th>
<th>Lock out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ropivacaine 0.2% (200ml premix)</td>
<td>Fentanyl 400mcg</td>
<td>5 mls</td>
<td>5-12 mls</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Bupivacaine 0.125%</td>
<td>Fentanyl 400 mcg</td>
<td>5 mls</td>
<td>5-8 mls</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Levo-bupivacaine 0.125 %</td>
<td>Fentanyl 400 mcg</td>
<td>5 mls</td>
<td>5-8 mls</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Levo-bupivacaine 0.0625%</td>
<td>Fentanyl 400 mcg</td>
<td>5 mls</td>
<td>8-12 mls</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Normal Saline 100mls</td>
<td>Pethidine 100mg</td>
<td>5 mls</td>
<td>None</td>
<td>15 minutes</td>
</tr>
</tbody>
</table>
**APPENDIX 7:**

eTG Therapeutic Guidelines for Surgical Antibiotic Prophylaxis:

<table>
<thead>
<tr>
<th>Procedure (adults)</th>
<th>Antibiotic Prophylaxis</th>
</tr>
</thead>
</table>
| **Colorectal surgery, appendicectomy.**  
_For low risk patients, the anaerobic cover provided by Metronidazole may be omitted:_  
• Upper GI surgery – patients with normal gastric acidity & motility, no obstruction, no bleeding & no malignancy or previous gastric surgery  
• Biliary tract surgery – patients less than 60yrs of age, non-diabetic & for elective cholecystectomy with low risk of exploration of the common bile duct | 1.) metronidazole 500 mg (child: 12.5 mg/kg up to 500 mg) IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision  
• PLUS EITHER  
  1. cephalozin 2 g (child: 30 mg/kg up to 2 g) IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision  
  OR  
  2. gentamicin (adult and child) 2 mg/kg IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision  
OR (as a single drug)  
  2. cefoxitin 2 g (child: 40 mg/kg up to 2 g) IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
| upper GI tract, biliary surgery including laparoscopic surgery | Cephalozin 2 g (child: 30 mg/kg up to 2 g) IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
| **Hernia Repair**  
• Antibiotic prophylaxis is not recommended for hernia repair without prosthetic material. | Antibiotic prophylaxis is not recommended for hernia repair without prosthetic material (mesh).  
The role of prophylactic antibiotics in hernia repair with prosthetic material (mesh) is uncertain. If there are risk factors for postoperative infection (eg immunocompromise, advanced age, reoperation, prolonged duration of surgery, use of surgical drains), consider cephalozin 2 g (child: 30 mg/kg up to 2 g) IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
| **Gastrointestinal endoscopic procedures** | There is no evidence to support the use of antibiotic prophylaxis for patients undergoing routine upper or lower gastrointestinal endoscopy. |
| **Caesarean Section** | Cephalozin 2 g IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
| **Hysterectomy - Vaginal**  
• Before hysterectomy, screening for bacterial vaginosis (BV) and for termination of pregnancy, screening for Chlamydia trachomatis & BV. | Cephalozin 2 g IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision  
PLUS  
metronidazole 500 mg IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision.  
Cephalozin 2 g IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
| **Hysterectomy - abdominal** | Cephalozin 2 g IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
| **Breast surgery**  
The need for prophylaxis in clean surgery of the breast remains controversial. Antibiotic prophylaxis is not required for wound revision, diagnostic excisional biopsy, or lumpectomy without wire localisation.  
Prophylaxis is recommended for patients undergoing breast cancer surgery (including lymph node exploration), reduction mammoplasty, procedures involving prosthetic implantation or wire localisation, and reoperations. | Cephalozin 2 g IV, within the 60 minutes (ideally 15 to 30 minutes) before surgical incision. |
### APPENDIX 8

**Fluids available at Caboolture Hospital**

<table>
<thead>
<tr>
<th>Fluid Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat Emulsion (Plastic)</td>
<td></td>
</tr>
<tr>
<td>Emulsion 20% , 500mL , Clinoleic</td>
<td>(10)</td>
</tr>
<tr>
<td>Glucose 10% Iv infusion 500mL , AHB0163 Baxter</td>
<td>(18)</td>
</tr>
</tbody>
</table>

Glucose 3.3% - Sodium Chloride 0.3% - Potassium Chloride 20mmol/lv infusion 1L , AHK6015 Baxter (12)

Glucose 3.3% - Sodium Chloride 0.3% Iv infusion 1L , AHB1034 Baxter (12)

Glucose 4% - Sodium Chloride 0.18% - Potassium Chloride 40mmol/lv infusion 1L , AHK6033 Baxter (12)

Glucose 4% - Sodium Chloride 0.18% Iv infusion 1L , AHB1254 Baxter (12)

Glucose 5% - Sodium Chloride 0.45% - Potassium Chloride 20mmol/lv infusion 1L , AHK6024 Baxter (12)

Glucose 5% - Sodium Chloride 0.9% - Potassium Chloride 20mmol/lv infusion 1L , AHB6066 Baxter (12)

Glucose 5% - Sodium Chloride 0.9% Iv infusion 1L , AHB1064 Baxter (12)

Glucose 5% (Non-PVC) Iv infusion 500mL , AHE60063 Baxter (Aviva) (24)

Glucose 5% Infusion 250mL , AHB0062 Baxter (24)

Glucose 5% Iv infusion 100mL , AHB0087 Baxter (Single Pack IV) (48)

Glucose 5% Ivy infusion 1L , AHB0064 Baxter (12)

Glucose 50% Iv infusion 500mL , AHB0253 Baxter (18)

Glycine UromaticIrrigation 1.5% , 2,000mL , AHB7316 Baxter (6)

Hartmanns (Sodium Chloride - Lactate Compound) Iv infusion 1L , AHB2324 Baxter (12)

Mannitolv Iv infusion 20%, 500mL , AHB3025 Baxter (18)

Sodium Chloride 0.29% - Potassium Chloride 10mmol/lv infusion 100mL , AHB6008 Baxter (48)

Sodium Chloride 0.9% - Potassium Chloride 20mmol/lv infusion 1L , AHB1764 Baxter (12)

Sodium Chloride 0.9% - Potassium Chloride 40mmol/lv infusion 100mL , AHB6053 Baxter (48)

Sodium Chloride 0.9% - Potassium Chloride 40mmol/lv infusion 1L , AHB6034 Baxter (12)

Sodium Chloride UromaticIrrigation 0.9% , 3000mL , AHB7127 Baxter (4)
<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Code</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Chloride Irrigation 0.9%, 1L</td>
<td></td>
<td>AHF7124</td>
<td>10</td>
</tr>
<tr>
<td>Sodium Chloride Irrigation 0.9%, 500mL</td>
<td></td>
<td>AHF7123</td>
<td>15</td>
</tr>
<tr>
<td>Sodium Chloride Infusion 0.45%, 500mL</td>
<td></td>
<td>AHB1313</td>
<td>18</td>
</tr>
<tr>
<td>Sodium Chloride Infusion 0.9%, 100mL</td>
<td></td>
<td>AHB1307</td>
<td>48</td>
</tr>
<tr>
<td>Sodium Chloride Infusion 0.9%, 1L</td>
<td></td>
<td>AHB1324</td>
<td>12</td>
</tr>
<tr>
<td>Sodium Chloride Infusion 0.9%, 250mL</td>
<td></td>
<td>AHB1322</td>
<td>24</td>
</tr>
<tr>
<td>Sodium Chloride Infusion 0.9%, 500mL</td>
<td></td>
<td>AHB1323</td>
<td>18</td>
</tr>
<tr>
<td>Sodium Chloride Infusion 3%, 250mL</td>
<td></td>
<td>AHK6046</td>
<td>24</td>
</tr>
<tr>
<td>Water For Injection Infusion 1L</td>
<td></td>
<td>AHB0304</td>
<td>12</td>
</tr>
<tr>
<td>Water For Irrigation Irrigation 1L</td>
<td></td>
<td>AHF7114</td>
<td>10</td>
</tr>
<tr>
<td>Water For Irrigation Irrigation 500mL</td>
<td></td>
<td>AHF7113</td>
<td>15</td>
</tr>
</tbody>
</table>
APPENDIX 9

Caboolture Hospital Pharmacy, Ph: 5433 8662

**On-Call Pharmacy Service**

Caboolture Hospital Pharmacy Department operates an on-call clinical pharmacy service outside of normal business hours and on weekends. (Contactable 24 hours a day)

This service is to provide **clinical medication advice**, and also to **facilitate the supply of medications** when necessary.

The on-call pharmacist is **not** on site at Caboolture/Kilcoy Hospitals, and the facility incurs a cost for each phone call.

**Please ensure your phone call is clinically appropriate prior to calling the on-call pharmacist.**

**For CLINICAL MEDICATION ADVICE:**

- **Nursing staff** – please discuss medication issue with medical officer or after-hours nurse manager initially. If issue is unable to be resolved, the after-hours nurse manager may contact on-call pharmacist.
- **Junior Doctors** – initially please discuss medication issue with medical registrar. If issue not able to be resolved – contact on-call pharmacist via hospital switchboard.
- **Registrars/Consultants** – Please contact on-call pharmacist via hospital switchboard.

For information on prescribing discharge/outpatient items as per Pharmaceutical Benefits Scheme (PBS), please refer to [www.pbs.gov.au](http://www.pbs.gov.au).

**For medication SUPPLY:**

- **Contact After-Hours Nurse Manager**
- If product is unavailable in hospital/after-hours drug store then After-Hours Nurse Manager will contact on-call pharmacist.
- The on-call pharmacist may be required to attend the hospital to supply the item, or source the item from another facility.

**Any questions regarding this service can be referred to:**

Timothy Dunn - Director of Pharmacy
Dect: 8661 Email: Timothy.Dunn2@health.qld.gov.au
Guidelines for Perioperative Care in Elective Colonic Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations

U. O. Gustafsson • M. J. Scott • W. Schwenk • N. Demartines • D. Roulin • N. Francis • C. E. McNaught • J. MacFie • A. S. Liberman • M. Soop • A. Hill • R. H. Kennedy • D. N. Lobo • K. Fearon • O. Ljungqvist

INTERN LEARNING OBJECTIVES SPECIFIC TO ANAESTHETICS

Patient identification

- Follows the stages of a verification process to ensure the correct identification of a patient
- Complies with the organisation's procedures for avoiding patient misidentification (W.H.O checklist)
- Confirms with relevant others the correct identification of a patient

History & Examination

- Recognises how patients present with common acute & chronic problems & conditions
- Undertakes a comprehensive & focussed history
- Performs a comprehensive examination of all systems
- Airway assessment
- Elicits symptoms & signs relevant to the presenting problem or condition

Investigations

- Follows up & interprets investigation results appropriately to guide patient management

Informed consent

- Applies the principles of informed consent in day to day clinical practice
- Identifies the circumstances that require informed consent to be obtained by a more senior clinician
- Provides a full explanation of procedures to patients considering factors affecting the capacity to give informed consent such as language, age & mental state

Systems

- Works in ways which acknowledge the complex interaction between the healthcare environment, doctor & patient
- Uses mechanisms that minimise error e.g. checklists, clinical pathways
- Participates in continuous quality improvement e.g. clinical audit
Infection Control

- Practices correct hand-washing & aseptic techniques
- Uses methods to minimise transmission of infection between patients
- Rationally prescribes antimicrobial/antiviral therapy for common conditions

Pain management

- Specifies & can justify the hierarchy of therapies & options for pain control
- Prescribes pain therapies to match the patient's analgesia requirements

Fluid, electrolyte & blood product management

- Identifies the indications for, & risks of, fluid & electrolyte therapy & blood products
- Recognises & manages the clinical consequences of fluid & electrolyte imbalance in a patient
- Develops, implements, evaluates & maintains an individualised patient management plan for fluid, electrolyte and blood product use
- Maintains a clinically relevant patient management plan of fluid, electrolyte & blood product use

Performance of Procedures

- Ensures that appropriate supervision is available
- Identifies the patient appropriately
- Prepares & positions the patient appropriately
- Recognises the indications for local, regional or general anaesthesia
- Arranges appropriate equipment
- Arranges appropriate support staff & defines their roles
- Provides appropriate analgesia &/or premedication
- Performs procedure in a safe and competent manner using aseptic technique
- Identifies & manages common complications
- Interprets results & evaluates outcomes of treatment
- Provides appropriate aftercare & arranges follow-up
Skills & Procedures

- Venepuncture
- IV cannulation
- Preparation & administration of IV medication, injections & fluids
- Arterial puncture in an adult
- IV infusion including the prescription of fluids
- IV infusion of blood & blood products
- Injection of local anaesthetic to skin
- Perform & interpret an ECG
- Perform & interpret peak flow
- Airway care including bag mask ventilation with simple adjuncts such as pharyngeal airway
- NG & feeding tube insertion

COMMON CLINICAL PROBLEMS & CONDITIONS

- Sepsis
- Shock
- Anaphylaxis
- Diabetes mellitus & direct complications
- Thyroid disorders
- Electrolyte disturbances
- Malnutrition
- Obesity
- Hypertension
- Heart failure
- Ischaemic heart disease
- Cardiac arrhythmias
- Thromboembolic disease
- Asthma
- Respiratory infection
- Chronic Obstructive Pulmonary Disease
- Obstructive sleep apnoea
- Anaemia
- Bruising & bleeding
- Management of anticoagulation
- Paracetamol overdose
INTERN LEARNING OUTCOMES IN ANAESTHETIC TERM

As an intern in anaesthetics you will not be expected to take any direct responsibility for patient care. You will be an observer, with opportunities to learn and practise some procedural skills e.g. airway skills under supervision. You may be asked to help the team by performing some IV cannulations or assess straightforward patients and report back to the anaesthetic consultant and registrar. So enjoy this term which is relatively free of responsibility, and make the most of the learning opportunities available.

The following points outline some of the broad outcomes expected of interns throughout the year, as well as some of the knowledge and skills specific to anaesthetics that you should be comfortable with by the end of this term.

BROAD OUTCOMES: (As outlined in AMC Intern Outcome Statements):

- Place the needs and safety of patients at the centre of the care process. Demonstrate safety skills including effective clinical handover, graded assertiveness, delegation and escalation, infection control, and adverse event reporting.
- Communicate clearly, sensitively and effectively with patients, their family/carers, doctors and other health professionals.
- Perform and document a problem-focused medical history with a relevant physical examination.
- Safely perform a range of common procedural skills required for work as an intern.
- Prescribe medications safely, effectively and economically, including fluid, electrolytes, blood products and selected inhalational agents.
- Recognise and assess deteriorating and critically unwell
- Retrieve, interpret and record information effectively in clinical data systems (both paper and electronic).
- Apply knowledge of the culture, spirituality and relationship to land of Aboriginal and Torres Strait Islander peoples to clinical practice and advocacy.
- Participate in quality assurance, quality improvement processes.
- Provide care to all patients according to Good Medical Practice: A Code of Conduct for Doctors in Australia.
- Optimise their personal health and wellbeing.
- Self-evaluate their professional practice, demonstrate lifelong learning behaviours
- Learn and work effectively as a member or leader of an inter-professional team.

The following skills, attributes and knowledge are derived from the Australian Curriculum Framework for Junior Doctors and are relevant to Anaesthetic Practice:

PATIENT ASSESSMENT:

- Undertakes a comprehensive & focussed history
- Performs a comprehensive examination of all systems
THERAPEUTICS:

- Takes account of the actions & interactions, indications, monitoring requirements, contraindications & potential adverse effects of each medication used
- Involves nurses, pharmacists & allied health professionals appropriately in medication management
- Evaluates the outcomes of medication therapy

INFECTION CONTROL:

- Practices correct hand-washing & aseptic techniques
- Uses methods to minimise transmission of infection between patients
- Rationally prescribes antimicrobial/antiviral therapy for common conditions

FLUID AND ELECTROLYTE AND BLOOD PRODUCT MANAGEMENT:

- Identifies the indications for, & risks of, fluid & electrolyte therapy & blood products
- Recognises & manages the clinical consequences of fluid & electrolyte imbalance in a patient
- Develops, implements, evaluates & maintains an individualised patient management plan for fluid, electrolyte and blood product use
- Maintains a clinically relevant patient management plan of fluid, electrolyte & blood product use

SKILLS AND PROCEDURES:

- Venepuncture
- IV cannulation
- Preparation & administration of IV medication, injections & fluids
- Arterial puncture in an adult
- IV infusion including the prescription of fluids
- IV infusion of blood & blood products
- Perform & interpret an ECG
- Airway care including bag mask ventilation with simple adjuncts such as pharyngeal airway
- NG & feeding tube insertion

RECOGNISE AND MANAGE COMMON SIGNS AND SYMPTOMS:

- Upper airway obstruction
- Nausea & Vomiting

RECOGNISE AND MANAGE COMMON CLINICAL CONDITIONS:

- Shock
- Anaphylaxis
- Diabetes mellitus & direct complications
- Electrolyte disturbances
• Obesity
• Hypertension
• Heart failure
• Ischaemic heart disease
• Cardiac arrhythmias
• Asthma
• Respiratory infection
• Chronic Obstructive Pulmonary Disease
• Obstructive sleep apnoea
• Menstrual disorders
• Anaemia
• Bruising & bleeding
• Management of anticoagulation

GENERAL:

• Participates in continuous quality improvement e.g. clinical audit