

NIL BY MOUTH (NBM) AND PERI-OPERATIVE MEDICINES USE GUIDELINE

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Approved by:	Pre-op Directorate Governance Meeting	
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This is the most current version and should be used until a revised document is in place		

Key Amendment

Date	Amendment	Approved by
21 st January 2019	Inclusion of advice for edoxaban. Additional information for the management of medicines for diabetes	Medicines Safety Committee
25 th June 2020	Document extended for 6 months during COVID-19 period.	QGC

Introduction

The term 'Nil By Mouth' is often used inappropriately and therefore can be misleading. Patients may be labelled 'Nil By Mouth' for several reasons and this may put the patient at risk of dehydration, malnutrition and the omission of essential regular medicines. Some patients are kept nil by mouth repeatedly for various investigations. As hospital in patients are often either malnourished or at risk of malnutrition even before admission it is essential that interference with nutritional intake be kept to a minimum. Careful consideration must be given to the use of the term. Examples of why patients may be nil by mouth:

- Pre or post surgery
- When the bowel is non-functional e.g. gastric outlet obstruction
- The patient is unable to swallow safely e.g. after a stroke, head injury, myasthenia gravis or reduced level of consciousness.
- Nausea or vomiting may also inhibit the intake of fluids, nutrition and oral medicines.

No patient should be without fluid input (either enteral or intravenous) for more than 10 hours. Certain groups of patients are particularly vulnerable and should not be left for long periods without hydration, correcting serum electrolytes as necessary:

- Elderly patients
- Patients who have undergone bowel preparation
- Acutely ill patients
- Breast feeding mothers
- Infants and children

If patients need to be kept NBM for longer (days) consider other methods of feeding such as nasogastric, naso-jejunal, PEG or parenteral feeding. This needs to involve multi-disciplinary team (medical and nursing staff, dieticians, pharmacists and speech and language therapists) including patients and relatives. Patients should be re-assessed at least daily to determine when regular feeding can be re-instated. Specific guidance on enteral and parenteral feeding can be found on the Trust intranet.

The National Confidential Enquiry into Peri-Operative Deaths (NCEPOD) report for 2001-02 ⁽¹⁾ found that many patients were not being given essential regular medicines before operations. The report

entitled 'Functioning as a team' says 'Of concern is the information on antianginal, bronchodilator and steroid treatment. These drugs should be given throughout the operative period and when the patient cannot take their oral drugs, there are simple topical, inhaled or parenteral replacement preparations readily available'. This recommendation is supported by an observational study by Kennedy et al ⁽²⁾ of over 1000 admissions for general and vascular surgery that found that a high number of patients scheduled for inpatient surgery took medicines unrelated to surgery, the majority of which (53%) were for cardiovascular problems. There was a higher incidence of peri-operative complications among patients who took such medicines and there was a significant association between abstinence from their regular medication and adverse outcomes. This guideline, produced as a result of a recommendation by The Royal College of Anaesthetists helps define which medicines should be administered pre and post-operatively and which should be discontinued. ⁽³⁾

- It is not appropriate to simply omit an oral medicine without first clarifying the instruction with the relevant team. It may be appropriate to give the oral medicine or to change to an alternative product using an alternative route. Failure to continue a patient's usual medication can potentially cause an exacerbation of their chronic condition or adverse effects from abrupt drug withdrawal to occur.
- When changing the route of administration of a drug care should be taken to ensure that the appropriate dose and frequency is prescribed, as these may not be the same as for the oral route. Please check with the ward pharmacist, anaesthetist Medicines Information (extension 30235) or the on-call pharmacist (available via switchboard).
- Patients are at risk of aspirating their stomach contents during general anaesthesia. Therefore minimum fasting periods for scheduled surgery are:
 - 6 Hours for solid food, infant formula or milk
 - 4 Hours for breast milk
 - 2 Hours for water, dilute squash or tea/coffee with a small amount of milkSee appendices for patient information
- As water leaves the stomach within 2 hours of ingestion, medicines can be given up to two hours before surgery with water.
- Chewing gum should not be chewed within 2 hours before anaesthesia. However, patients who have chewed gum pre-operatively should not have their surgery/procedure cancelled for this reason
- There are a few significant interactions between drugs used during surgery and routine medications that require the drugs not to be administered concurrently. The anaesthetist will usually manage this, by their choice of anaesthetic technique but the advice given in this document will help limit potential problems
- This guideline is intended to provide advice on therapy that should be continued or discontinued for patients who are 'nil by mouth' It is NOT intended to provide advice regarding the alteration to the preparation, formulation or alternative medicine for specific therapies. For this information, please contact your ward pharmacist or Medicines Information (Mon-Friday 9am to 5pm) on extension 30235.

Adjustment to routine medication during the peri-operative period

Routine medicines should wherever possible, be reviewed *prior* to surgery for:

1. Medicines that should be continued throughout the peri-operative period to prevent relapse of the treated condition or to avoid the effects of drug withdrawal.
2. Medicines that should be withheld before surgery to reduce the risks that they may impose upon the procedure.

Pre-operative assessment registered nursing staff may use this guideline to advise patients on medicines use but must refer specific cases to the surgeon and or anaesthetist for advice if they are not confident about the correct course of action. Written instruction should be given to the patient and the registered nursing staff should ensure understanding of the instructions given.

If adjustments to therapy cannot be made e.g. for emergency admissions, ensure the surgeon and anaesthetist are aware of the patients medication history.

Protocol for managing anticoagulants when operation cancelled following temporary cessation of oral anticoagulants

When a patient who is taking oral anticoagulants is listed for planned surgery this information must be clear on the booking form so that cancellation of surgery after cessation of oral anticoagulants is avoided unless on clinical grounds.

When a patient who is taking oral anticoagulants is listed for planned surgery clear advice will be given to the patient at the time of the pre-operative assessment regarding cessation of medicines. In the event their surgery is cancelled the patient should contact the consultant for their care should advice not be given at the time of cancellation.

On the rare occasion where the patient has ceased taking their oral anticoagulants in preparation for surgery and their operation is cancelled it is the responsibility of the consultant or operating surgeon to give appropriate advice to the patient, this will depend on the indication for the anticoagulation and the date if the rescheduled surgery. Advice can be sought by the consultant or operating surgeon from cardiology or haematology.

PERI-OPERATIVE MEDICINES USE GUIDANCE

Medication	Advice	Comments
ACE Inhibitors E.g. captopril, enalapril, fosinopril, lisinopril, ramipril, trandolapril.	Withhold on day of surgery unless stopping is medically contra-indicated (i.e. in cases of congestive heart failure, poorly controlled hypertension or if specifically mentioned by POA consultant anaesthetist)	ACE inhibitors may be associated with intraoperative haemodynamic instability. For elective surgery they should ideally be withheld on the day of surgery but restarted as soon as is reasonable afterwards. If a patient does continue their ACEi this should not automatically preclude surgery - this decision should be taken on a case by case basis.
Allopurinol	Continue	Must ensure patient is able to take with sufficient water to prevent oesophageal lodging.
Alpha blockers e.g. doxazosin, tamsulosin	Decision to continue on clinical grounds	Consider indication e.g. if for hypertension, continue for blood pressure control; if for urinary retention and patient catheterized, may be withheld if patient at risk of hypotension. Alpha blockers should be discontinued post TURP if prescribed for urinary retention.
Aminosalicylates e.g. Mesalazine (Asacol, Pentasa)	Continue unless bowel surgery then omit on day of procedure	Preparations for alternative routes of administration are available if indicated. Review need to continue therapy according to surgical procedure.

Analgesia - Opioid	See comments	Patients should not be left without analgesia. Pre-operatively, the patient's usual analgesia should be continued and the anaesthetist informed of the regimen. Post-operatively, alternative routes of administration may be used if the patient is unable to take oral medicines. Please seek advice from the anaesthetist/pharmacist/Acute Pain Control Guidelines as appropriate.
Angiotensin II antagonists e.g. losartan, candesartan	Withhold on day of surgery unless stopping is medically contra-indicated (i.e. in cases of congestive heart failure, poorly controlled hypertension or if specifically mentioned by POA consultant anaesthetist)	Angiotensin II antagonists may be associated with intraoperative haemodynamic instability. For elective surgery they should ideally be withheld on the day of surgery but restarted as soon as is reasonable afterwards. If a patient does continue their Angiotensin II Antagonist this should not automatically preclude surgery - this decision should be taken on a case by case basis.
Anti-androgens e.g. bicalutamide, cyproterone, finasteride	Continue	
Anti-anginal therapy e.g. isosorbide mononitrate, nicorandil	Continue	Alternative routes of administration are available if the patient is nil by mouth post-operatively, please seek advice from pharmacy.
Anti-arrhythmics E.g. amiodarone, digoxin, disopyramide, flecainide, verapamil.	Continue	Anti-arrhythmic drugs should generally be continued to prevent relapse of the arrhythmia. However, amiodarone can safely be omitted for a few days as it has a very long half-life. Digoxin, amiodarone and verapamil can be given by injection if the patient is unable to take orally. Consult the pharmacist for dosage advice. Omit therapy if the patient is bradycardic (<50 beats per minute)

Anticoagulants (Oral)	Warfarin, phenindione	See comments	<p>Refer to Trust guideline WAHT-HAE-002. Oral anticoagulants increase the risk of bleeding complications and should, ideally, be stopped 5 days before surgery to allow the INR to fall below 1.5. Continuing anticoagulation with LMWH or unfractionated heparin can be given in the interim as appropriate, either at prophylactic or full treatment dose, according to the clinical indication. If it is not possible to stop oral anticoagulation, the effects can be reversed within 12 hours with oral vitamin K, 6-8 hours with IV vitamin K or immediately with Beriplex (on specialist advice). Epidural analgesia will require an INR ≤ 1.5</p> <p>Patients who attend hospital and may need theatre should be given iv vitamin K as soon as possible as this may prevent the need for PCC if they require an operation later in their hospital stay</p>
	Dabigatran etexilate - Pradaxa®	See comments	<p>Refer to Trust guideline WAHT-HAE-002.</p> <p>Patients on dabigatran should have their PT and APTT measured prior to a surgical procedure.</p> <p>The manufacturer does not recommend concomitant use with post-op indwelling epidural/spinal catheters. Other forms of central neuraxial blockade or regional anaesthesia for surgery are not contraindicated. If an epidural catheter is placed, withhold the re-introduction of dabigatran until 24 hours after epidural removal.</p> <p>The risk of epidural or spinal haematoma may be higher with the concomitant use of other medicines affecting haemostasis. Prior to neuraxial intervention consideration should be given to the potential benefit versus the risk in anticoagulated patients or in patients to be anticoagulated for thromboprophylaxis.</p> <p>The first dose of dabigatran may be given 2-4 hours after cessation of surgery if haemostasis satisfactory. If there is a concern over bleeding, the re-introduction of dabigatran should be delayed but consider the use of prophylactic LMWH if the delay is >24 hours.</p> <p>Dabigatran is contraindicated in patients with severe renal impairment (creatinine clearance < 30 ml/min) These patients should therefore receive reduced dose low molecular weight heparin or unfractionated heparin as detailed in the Guidelines for Thromboprophylaxis for Adult</p>

Inpatients Undergoing Surgery (WAHT-SUR-007) Please refer to the Summary of Product Characteristics for more detailed information on dosing in mild renal impairment and in patients aged >75 years.

For patients requiring surgery whilst taking Dabigatran, therapy should be stopped as detailed in the table below.

Renal function (CrCL in ml/min)	Estimated half- life (hours)	Stop dabigatran before elective surgery	
		Standard risk	High risk of bleeding or major surgery
≥ 80	~ 13	24 hours before	2 days before
≥ 50-< 80	~ 15	2 days before	3 days before
≥ 30-< 50	~ 18	3 days before	4 days before (> 48 hours)
<30	~27	5 days before	5 days before

Emergency Surgery

If it is not possible to stop therapy as described above, the blood bank should be informed to allow time for cross matching of blood, platelets and the thawing of FFP if there is excessive bleeding during surgery. Where life-threatening bleeding is present the use of prothrombin complex concentrate and/or recombinant factor VIIa (NovoSeven) should be considered. Epidural or spinal anaesthesia should be avoided. Consideration should be given to the use of tranexamic acid (contra-indicated in urinary tract bleeding). There is no indication for the routine use of FFP or platelets without major haemorrhage as these will not reverse the effects of the drug

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Anticoagulants (Oral)	Rivaroxaban - Xarelto®	See comments	<p>Refer to Trust guideline WAHT-HAE-002 Patients on rivaroxaban should have their PT and APTT measured prior to a surgical procedure.</p> <p>The manufacturer advises the risk of epidural or spinal haematoma may be increased by the post-operative use of indwelling epidural catheters or the concomitant use of medicinal products affecting haemostasis. Prior to neuraxial intervention the physician should consider the potential benefit versus the risk in anticoagulated patients or in patients to be anticoagulated for thromboprophylaxis.</p> <p>For epidural catheter removal, ensure at least 18hours between the last dose of Rivaroxaban and epidural catheter removal. Rivaroxaban may be restarted after at least 6 hours post removal of epidural catheter.</p> <p>Give the first dose 6-10 hours post surgery provided haemostasis satisfactory unless traumatic epidural or spinal in which case give first dose 24 hours post procedure.</p> <p>In patients with severe renal impairment (creatinine clearance < 30 ml/min) rivaroxaban plasma levels may be significantly increased which may lead to an increased bleeding risk. These patients should therefore receive reduced dose low molecular weight heparin or unfractionated heparin as detailed in the Guidelines for Thromboprophylaxis for Adult inpatients Undergoing Surgery (WAHT-SUR-007)</p>
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			<p>For patients undergoing surgery, rivaroxaban, should be stopped as advised below:</p> <table border="1"> <thead> <tr> <th rowspan="2">Renal function (CrCL in ml/min)</th> <th colspan="2">Timing of last dose before elective surgery</th> </tr> <tr> <th>Standard risk</th> <th>High risk of bleeding or major surgery</th> </tr> </thead> <tbody> <tr> <td>≥ 80</td> <td>24 hours before</td> <td>2 days before</td> </tr> <tr> <td>≥ 50-< 80</td> <td>2 days before</td> <td>3 days before</td> </tr> <tr> <td>≥ 30-< 50</td> <td>3 days before</td> <td>4 days before</td> </tr> <tr> <td><30</td> <td>5 days before</td> <td>5 days before</td> </tr> </tbody> </table> <p>Emergency Surgery If it is not possible to stop therapy as described above, the blood bank should be informed to allow time for cross matching of blood, platelets and the thawing of FFP if there is excessive bleeding during surgery. Where life-threatening bleeding is present the use of prothrombin complex concentrate and/or recombinant factor VIIa (NovoSeven) should be considered. Epidural or spinal anaesthesia should be avoided. Consideration should be given to the use of tranexamic acid (contra-indicated in urinary tract bleeding). There is no indication for the routine use of FFP or platelets without major haemorrhage as these will not reverse the effects of the drug.</p>	Renal function (CrCL in ml/min)	Timing of last dose before elective surgery		Standard risk	High risk of bleeding or major surgery	≥ 80	24 hours before	2 days before	≥ 50-< 80	2 days before	3 days before	≥ 30-< 50	3 days before	4 days before	<30	5 days before	5 days before
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	Edoxaban (Lixiana)	See comments	<p>Refer to Trust guideline WAHT-HAE-002 Patients on Edoxaban should have their PT and APTT measured prior to a surgical procedure</p> <p>For patients undergoing surgery, edoxaban, should be stopped as advised below:</p> <table border="1" data-bbox="898 448 2132 738"> <thead> <tr> <th data-bbox="898 448 1160 491">Renal Function</th> <th data-bbox="1160 448 1668 491">Procedure with low bleeding risk</th> <th data-bbox="1668 448 2132 491">Procedure with high bleeding risk</th> </tr> </thead> <tbody> <tr> <td data-bbox="898 491 1160 619">CrCl >50mL/min</td> <td data-bbox="1160 491 1668 619">Stop 24 hours before procedure. No edoxaban to be taken on day of procedure.</td> <td data-bbox="1668 491 2132 619">Stop 2 days before procedure. No edoxaban to be taken on day of procedure.</td> </tr> <tr> <td data-bbox="898 619 1160 738">CrCl 15-50mL/min</td> <td data-bbox="1160 619 1668 738">Stop 2 days before procedure. No edoxaban to be taken on day of procedure.</td> <td data-bbox="1668 619 2132 738">Stop 3 days before procedure. No edoxaban to be taken on day of procedure.</td> </tr> </tbody> </table>			Renal Function	Procedure with low bleeding risk	Procedure with high bleeding risk	CrCl >50mL/min	Stop 24 hours before procedure. No edoxaban to be taken on day of procedure.	Stop 2 days before procedure. No edoxaban to be taken on day of procedure.	CrCl 15-50mL/min	Stop 2 days before procedure. No edoxaban to be taken on day of procedure.	Stop 3 days before procedure. No edoxaban to be taken on day of procedure.
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	Apixaban Eliquis®	See comments	<p>Refer to Trust guideline WAHT-HAE-002</p> <p>Elective surgery Apixaban has a half-life of 10-15 hours but is only partially renally excreted (~30%). For procedures with a high risk of bleeding the drug should be discontinued for 48 hours, procedures with a lower risk of bleeding should be discontinued for 24 hours. A normal PT and APTT suggests that the anticoagulant effect of the drug has worn off. Apixaban can be restarted when haemostasis is secure and there is no further risk of bleeding, if there is a delay of >24 hours in restarting the apixaban the patient should be assessed to receive thromboprophylaxis with low molecular weight heparin. Apixaban should not be given until epidural catheters have been removed for 5 hours.</p> <p>Emergency surgery If patient requires emergency surgery ideally it should be delayed as long as clinically possible to allow maximal reversal of the apixaban. Consideration should be given to activated charcoal</p>		
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			<p>if there is no contra-indication. Prior to surgery the blood bank should be informed to allow time for cross matching of blood, platelets and the thawing of FFP if there is excessive bleeding during surgery. When surgery does take place, if there is bleeding, then there should be early use of blood, platelets and FFP. Where life-threatening bleeding is present the use of prothrombin complex concentrate and/or recombinant factor VIIa (NovoSeven) should be considered. Epidural or spinal anaesthesia should be avoided. Consideration should be given to the use of tranexamic acid (contra-indicated in urinary tract bleeding). There is no indication for the routine use of FFP or platelets without major haemorrhage as these will not reverse the effects of the drug.</p> <p>Dental procedures Apixaban at standard dose is approximately equitant to an INR of 2.5. Therefore dental procedures that previously would have been safely performed while on warfarin can be performed without interruption of apixaban. It is reasonable to schedule the surgery as long after the apixaban as possible to achieve lowest drug levels during the time of operation and to avoid having the next dose for 4 hours after the procedure.</p>
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Anticoagulants (parenteral)	Low molecular weight heparin e.g. enoxaparin	See comments	<p>If the patient is to have an epidural catheter, ensure at least 12 hours between prophylactic dose and 24 hours for treatment dose enoxaparin administration and the insertion of the epidural catheter. This is to reduce the risk of epidural haematoma. For epidural catheter removal, ensure this is at least 12 hours after enoxaparin administration. Once the epidural catheter has been removed, allow at least 4-6 hours before administering the next dose.</p>
	Fondaparinux	See comments	<p>If the patient is to have an epidural catheter, fondaparinux may be given 6 to 12 hours postoperatively. For epidural catheter removal, ensure at least 36 hours between the last dose of fondaparinux and removal of the epidural catheter. Fondaparinux may then be restarted 12 hours post removal of the epidural catheter.</p>

Antidiabetic medicines (see appendix 4)	Sulphonylureas e.g. gliclazide, glipizide	See comments	Omit on the morning of procedure and see appendix 3. NB glibenclamide has renally excreted active metabolites which may result in a prolonged duration of action. Consider stopping pre-operatively.
	Metformin	See comments	<p>For Surgical patients undergoing a short starvation period (no more than one missed meal) metformin should be continued as normal. For patients with longer starvation periods, stop metformin when the preoperative fast begins and restart postoperatively once the patient is eating again. Use with caution in patients at risk of renal impairment e.g. in dehydration or the co-prescribing of potentially nephrotoxic agents. See WAHT-ANA-019</p> <p>For patients undergoing IV contrast with normal renal function (creatinine clearance >60ml/minute), there is no need to omit metformin. For patients with renal impairment, stop metformin for 48 hours following the procedure. Restart metformin when renal function is satisfactory.</p>
	Glitazones e.g. pioglitazone	Continue	
	Acarbose	See comments	Continue unless patient starved (omit if NBM as tablets must be taken with food)
	GLP-1 agonist e.g. exenatide	Continue	
	DPP-4 inhibitors e.g. sitagliptin	See comments	Continue unless more than one meal missed . Stop if VRII commenced and restart when patient is eating and drinking
	Meglitinide (repaglinidine or nateglinide)	See comments	Omit morning dose if NBM. Stop if VRII commenced and restart when patient is eating and drinking

	SGLT2 inhibitors e.g. canagliflozin, dapagliflozin	See comments	Omit on day of surgery and restart when the patient is eating and drinking normally Action induces an osmotic diuresis, which may reduce intravascular volume and decreased blood pressure.
Anti-epileptics E.g. phenytoin, carbamazepine, sodium valproate.		Continue	Anti-epileptics should be continued since abrupt withdrawal may precipitate seizures. Patients may have reduced requirements for general anaesthesia. Alternative routes of administration are available if the patient is nil by mouth post-operatively.
Anti-muscarinic drugs Orphenadine, Prochlorperazine, Trihexyphenidyl		Continue	Withhold if patient is presenting with intestinal obstruction or post operative ileus or urinary retention post catheter removal
Anti-Parkinsonian Drugs e.g. cabergoline, madopar, sinemet.		Continue	These drugs should be continued wherever possible as per the patient's usual regimen (at the times determined by the patient/carer) as uncontrolled symptoms reduce mobility and impede recovery. Alternative medication is available to relieve rigidity and tremor if the patient is (truly) unable to take oral medication after surgery. Avoid pethidine and tramadol with selegiline. Do NOT prescribe metoclopramide or prochlorperazine in Parkinson's Disease (domperidone may be given in patients without cardiovascular risk factors)

Anti-platelet Drugs	Aspirin	See comments	<p>For patients with coronary artery stents, each case must be considered with liaison between the surgeon, anaesthetist and cardiologist. See flow diagram for management at the end of this document</p> <p>In general, aspirin/clopidogrel/prasugrel/ticagrelor should be stopped when the risks of postoperative bleeding are high or where the consequences of even minor bleeding are significant e.g. retinal. This must be balanced against the risk of precipitating thromboembolic complications if these are stopped, particularly in those with unstable angina. If low dose aspirin, clopidogrel, prasugrel or ticagrelor are to be stopped, this is generally done 7 days (14 days for ticlopidine) before surgery to allow recovery of adequate platelet function. Restart antiplatelet therapy as soon after surgery as possible (ensuring that any epidural catheter has been removed first). See appendix 4 regarding timing advice relating to spinal/epidural anaesthesia</p> <p>Cilostazol has a platelet aggregation inhibitory effect leading to a possible increased bleeding risk. For patient's at risk of peri-operative bleeding, cilostazol should be stopped 5 days before surgery.</p>
	Cilostazol	See comments	
	Clopidogrel	See comments	
	Prasugrel	See comments	
	Ticagrelor	See comments	
	Ticlopidine	See comments	
	Dipyridamole	See comments	
	Platelet glycoprotein IIb/IIIa receptor antagonists	See comments	Time to normal platelet aggregation once discontinued is approximately 8 hours for eptifibatide and tirofiban and 24 to 48 hours for abciximab

<p>Anti-psychotics & Anxiolytics E.g. diazepam, chlorpromazine, sulphiride. (Not clozapine)</p>	<p>Continue</p>	<p>Generally continued to avoid relapse of the condition. Antipsychotics may reduce anaesthetic requirements and potentiate arrhythmias.</p>
<p>Anti- TNF e.g. etanercept</p>	<p>See comments</p>	<p>Discuss use with primary prescriber. The British Society for Rheumatology Guidelines state: In RA patients on anti-TNF, the potential benefit of preventing post-operative infections by stopping treatment should be balanced against the risk of a perioperative flare in RA activity. If anti-TNF is to be stopped prior to surgery, Consideration should be given to stopping at a time 3–5 times the half-life for the relevant drug before surgery (for etanercept this is approximately 2 weeks, for others discuss with Medicines Information ext 20235) Anti-TNF should not be restarted after surgery until there is good wound healing and no evidence of infection.</p>
<p>Aromatase inhibitors Anastrozole, Exemestane, Letrozole</p>	<p>Continue</p>	<p>Prescribe VTE prophylaxis and compression stockings</p>
<p>Asthma medication e.g. Inhaled bronchodilators</p>	<p>Continue</p>	<p>It is important that the patient is as stable as possible before surgery. The usual inhaled treatment is given before surgery and an extra dose of bronchodilator may be given with the pre-medication. Nebulised therapy may be used as an alternative.</p>
<p>Azathioprine</p>	<p>Continue</p>	<p>Review need to continue therapy according to surgical procedure and indication. Consider stopping immunosuppressive therapy if patient develops a significant systemic infection</p>
<p>Baclofen</p>	<p>Continue</p>	<p>Abrupt withdrawal may lead to hallucinations, psychotic reactions, convulsions and tachycardia.</p>

<p>Benzodiazepines e.g. diazepam, temazepam</p>	<p>Continue</p>	<p>Abrupt withdrawal may lead to withdrawal symptoms</p>
<p>Beta-blockers e.g. atenolol, bisoprolol, metoprolol, sotalol.</p>	<p>Continue</p>	<p>In patients with hypertension, anesthesia and surgery may provoke tachycardia and increase blood pressure. Beta-blockers may help to suppress these effects and reduce cardiovascular complications e.g. myocardial infarction and are therefore usually continued peri-operatively.</p>
<p>Bisphosphonates e.g. alendronate, risedronate</p>	<p>Continue</p>	<p>Must be able to take with a full glass of water whilst standing or sitting upright for 30 minutes. If unable to do so, omit dose.</p>
<p>Calcium channel blockers e.g. amlodipine, felodipine</p>	<p>Continue</p>	<p>Should be given to prevent hypertension and angina.</p>
<p>Clozapine</p>	<p>See comments</p>	<p>Clozapine should be stopped 24 hours before surgery. Therefore, if the patient is on the morning list – do not give on the day before surgery as well as the day of surgery itself. There are no withdrawal problems from doing this. If patient is unable to take clozapine for more than 2 days due to being ‘nil by mouth’ the drug must be gradually re-titrated up from the starting dose (25mg 1-2 times a day) – contact Pharmacy for advice.</p> <p>Please ensure the patient brings a suitable supply into hospital. Clozapine is no longer stocked at WAHT but a supply may be obtained from Lloyds Pharmacy if the patient does not have their own (this may result in a delay in therapy).</p>

Contraceptives	Combined (COC)	See comments	Oestrogen containing oral contraceptives should be discontinued 4-6 weeks before major elective surgery and all surgery to the legs to reduce the risk of thromboembolism. Alternative contraception e.g. progestogen only pill, should be discussed with the patient but due to the risk of pregnancy, document all decisions and exclude pregnancy prior to surgery. COC should not be restarted until the first menses that occur at least two weeks after the patient is fully mobile following surgery. Alternatively, ensure adequate thromboprophylaxis with compression stockings and LMWH.
	Progesterone only	Continue	Ensure thromboprophylaxis prescribed.

<p>Corticosteroids e.g. prednisolone.</p>	<p>Continue</p>	<p>Continue usual steroid dose on morning of surgery. Risk of HPA axis suppression if patients have been on steroids for 1-2 weeks before surgery or have been on steroids within the last 6 months. Dose and duration of steroids will determine the risk, as will the type of surgery. Stress due to surgery is associated with an increased cortisol production. Therefore, these patients will require IV hydrocortisone cover. Usual dose in major surgery is 50mg of hydrocortisone given pre-operatively, intra-operatively if necessary and every 6-8 hours for 2-3 days after surgery. Normal pre-operative steroid cover should be re-started 2 days after surgery (no gradual dose reduction is needed from post-operative cover). 20mg iv hydrocortisone is equivalent to 5mg oral prednisolone but consider dose increase in major surgery to allow for normal stress response.</p>
<p>Ciclosporin</p>	<p>Continue</p>	<p>If patient NBM: Non-transplant patient = omit dose Transplant patient = obtain specialist advice</p>
<p>Cilostazol</p>	<p>See Comments</p>	<p>Due to cilostazol's platelet aggregation inhibitory effect, there is a possible increased bleeding risk. For patient's at risk of peri-operative bleeding, cilostazol should be stopped 5 days before surgery.</p>
<p>Clonidine</p>	<p>Continue</p>	<p>Abrupt withdrawal may precipitate hypertensive crisis. Alternative route may be used if patient is NBM</p>
<p>Dementia medication e.g. donepezil, galantamine, rivastigmine</p>	<p>See comments</p>	<p>Donepezil, galantamine and rivastigmine as cholinesterase inhibitors, are likely to exaggerate succinylcholine-type muscle relaxation during anaesthesia. Decision to stop or continue to be made on clinical grounds</p>
<p>Digoxin</p>	<p>Continue</p>	<p>IV route may be used if the patient is unable to take oral therapy. Seek advice from Pharmacy regarding dose adjustment</p>

Diuretics	Thiazides e.g. bendroflumethiazide.	Continue	Thiazide and loop diuretics need not be omitted. Any electrolyte imbalance should be corrected before surgery.
	Loop diuretics e.g. frusemide		Withhold if patient dehydrated but seek advice if patient has cardiac failure.
	Potassium sparing diuretics e.g. amiloride, spironolactone	See comments	Omit potassium-sparing diuretics on the morning of surgery as reduced kidney perfusion in the immediate post-operative period may predispose to hyperkalaemia.
Drugs of dependence e.g. methadone		See comments	Should be given to prevent symptoms of withdrawal. Suggest that the usual dose is continued after surgery and the patient's pain managed separately. Seek advice from the anaesthetist
Erythropoietin e.g. darbepoetin		Continue	Possible increased risk of thrombosis, ensure appropriate thromboprophylaxis
Gabapentin		Continue	
Glucosamine		See comments	Glucosamine may affect blood glucose control. Glucosamine and chondroitin may have an anticoagulant effect and should therefore be discontinued two weeks prior to surgery.

Herbal Medicines This list is not exhaustive, please contact medicines information on 30235 for further information	Ephedra	Discontinue	Risk of MI and stroke from tachycardia and hypertension. Potential to interact with MAOI's. Discontinue at least 24 hours before surgery, ideally 2 weeks before.
	Echinacea	Discontinue	Discontinue as far in advance as possible before surgery. Possible increased risk of infection and poor wound healing.
	Garlic	Discontinue	Possible increased risk of bleeding especially in combination with other anti-platelet drugs. Discontinue at least 7 days before surgery.
	Ginkgo	Discontinue	Possible increased risk of bleeding especially in combination with other anti-platelet drugs. Discontinue at least 7 days before surgery.
	Ginseng	Discontinue	Possible increase risk of bleeding. Discontinue at least 7 days before surgery.
	Kava	Discontinue	Possible increased sedation with anaesthetics. Discontinue at least 24 hours before surgery.
	St John's Wort	Discontinue	Interaction with a number of drugs including warfarin and steroids. Refer to BNF for other interactions. Discontinue at least 5 days before surgery.
	Valerian	Discontinue	Possible increased sedation with anesthetics. Reduce dose slowly over several weeks before surgery. If this is not possible continue until day of surgery. Withdrawal symptoms may develop during post-operative period.

Hormone Replacement Therapy (HRT)	See comments	Preferably discontinue 4 weeks prior to <i>major</i> surgery or where there is a high risk of a thromboembolic event. If not, HRT may be continued peri-operatively but thromboprophylaxis is recommended.
Hydroxychloroquine	Continue	Hydroxychloroquine may exert an antiplatelet effect as described by some studies on its use for thromboprophylaxis. However, due to its long elimination half-life it is not practical to stop this pre-operatively
Insulin	See comments	See appendix 3. Variable Rate Intravenous Insulin Infusion (VRIII) is usually not necessary for patients with a planned short starvation period (no more than one meal will be missed) If VRIII is required, this should stop when the patient is able to eat and drink normally
Iron supplements	See comments	Continue unless bowel surgery then discontinue 7 days pre-operatively.
Levothyroxine, liothyronine	Continue	
Lithium	See comments	Ideally, stop lithium 24 hours before <i>major</i> surgery (but it may be continued in minor surgery) due to risk of toxicity in the peri-operative period due to changing lithium blood levels. If it is not possible to stop, ensure adequate fluid intake during and after surgery. Monitor U+Es regularly. Measure lithium blood levels if necessary. Lithium may be restarted soon after the operation.
Methotrexate	See comments	Withhold dose if due within 48 hours of major surgery. Continue weekly dose if possible to prevent condition flare. If active infection present withhold dose. NB authority to prescribe rests with senior clinician (consultant or SpR)

Monoamine Oxidase Inhibitors (MAOIs) e.g. phenelzine		Discontinue	MAOIs may result in hypertensive crisis with the concurrent use of interacting drugs e.g. pethidine, pentazocine. They are usually withdrawn 2 weeks before surgery. If necessary, they can be substituted with a short acting MAOI such as moclobemide (which can be withheld on the morning of surgery). If withdrawal is not possible, avoid pethidine and pentazocine. Phentolamine can be used to lower the blood pressure in the event of a hypertensive crisis. Inform the anaesthetist of any patients taking an MAOI.
Moclobemide		See comments	Omit on the morning of surgery but continue post-op. Ensure anaesthetist aware patient taking moclobemide
NSAIDs	Conventional e.g. ibuprofen, diclofenac,	See comments	Possible increased risk of bleeding. If the risks of postoperative bleeding are high or where the consequences of even minor bleeding are significant e.g. retinal, stop NSAIDs 3 days before surgery to allow platelet function to recover.
	COX-2 inhibitors e.g. celecoxib	Continue	
Pentosan polysulfate		See comments	Pentosan has anticoagulant and antiplatelet effects so the risk of bleeding must be considered. Elimination half-life of pentosan of up to 27 hours has been measured. Ensure the anaesthetist is aware that the patient is taking pentosan.
Selective Serotonin Re-uptake Inhibitors (SSRI) E.g. fluoxetine, paroxetine		Continue	Abrupt withdrawal may lead to withdrawal symptoms such as headache, dizziness, paraesthesia, anxiety and nausea. There is a risk of serotonin syndrome with the concurrent administration of pethidine. NB. Be aware of drug interactions with SSRIs.

<p>Statins e.g. simvastatin, atorvastatin</p>	<p>See comments</p>	<p>May be continued if patient has good renal and hepatic function. NB risk of myopathy and rhabdomyolysis. Omit if LFTs are deranged, creatinine kinase is raised or interacting medicines prescribed.</p>
<p>Tamoxifen</p>	<p>See comments</p>	<p>For patients with <i>breast cancer</i> undergoing major surgery, tamoxifen therapy should be stopped 4 weeks pre-operatively. Ensure adequate thromboprophylaxis with LMWH and compression stockings (especially if tamoxifen has been continued) as there is an increased risk of thromboembolism post-operatively. Tamoxifen should be restarted two weeks postoperatively if the patient is fully mobile.</p> <p>For patients being treated for <i>infertility</i>, tamoxifen should be discontinued 6 weeks pre-operatively and restarted only when the patient is fully mobile.</p>
<p>Theophylline, aminophylline</p>	<p>Continue</p>	<p>Alternative preparations are available, consult pharmacist. Check plasma theophylline concentration for patients at risk of arrhythmias.</p>
<p>Tricyclic Antidepressants E.g. amitryptiline, dosulepin, lofepramine</p>	<p>Continue</p>	<p>Abrupt withdrawal may lead to withdrawal symptoms such as headache, dizziness, paraesthesia, anxiety and nausea. TCAs may increase the risk of ventricular arrhythmias and hypertension during surgery. For patients with a high cardiovascular risk planned for major surgery, TCAs may be withdrawn slowly 2 weeks before surgery to reduce this risk. This may not be possible in severely depressed patients. If therapy continued, ensure the anaesthetist is aware and monitor patients for withdrawal symptoms if doses missed in the post-operative period.</p>
<p>Ulcer-healing medicines e.g. ranitidine, omeprazole, lansoprazole</p>	<p>Continue</p>	
<p>Vitamin and mineral supplements</p>	<p>Continue</p>	
<p>Warfarin</p>	<p>See oral anticoagulants</p>	

Please note that the key documents are not designed to be printed, but to be used on-line. This is to ensure that the correct and most up-to-date version is being used. If, in exceptional circumstances, you need to print a copy, please note that the information will only be valid for 24 hours and should be read in conjunction with the key document supporting information page

MONITORING TOOL

Key control:	Checks to be carried out to confirm compliance with the policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: <i>(Responsible for also ensuring actions are developed to address any areas of non-compliance)</i>	Frequency of reporting:
WHAT?	HOW?	WHEN?	WHO?	WHERE?	WHEN?
No patient will be without fluid input (enteral or parenteral) for more than 10 hours	Care and comfort rounds	Hourly	Nursing staff	Nurse manager	Daily
Essential regular medicines will not be omitted pre-operatively from surgical patients (unless there is a clinical reason to do so)	Audit	Annual	Pharmacy	Medicines Optimisation Committee	Annual

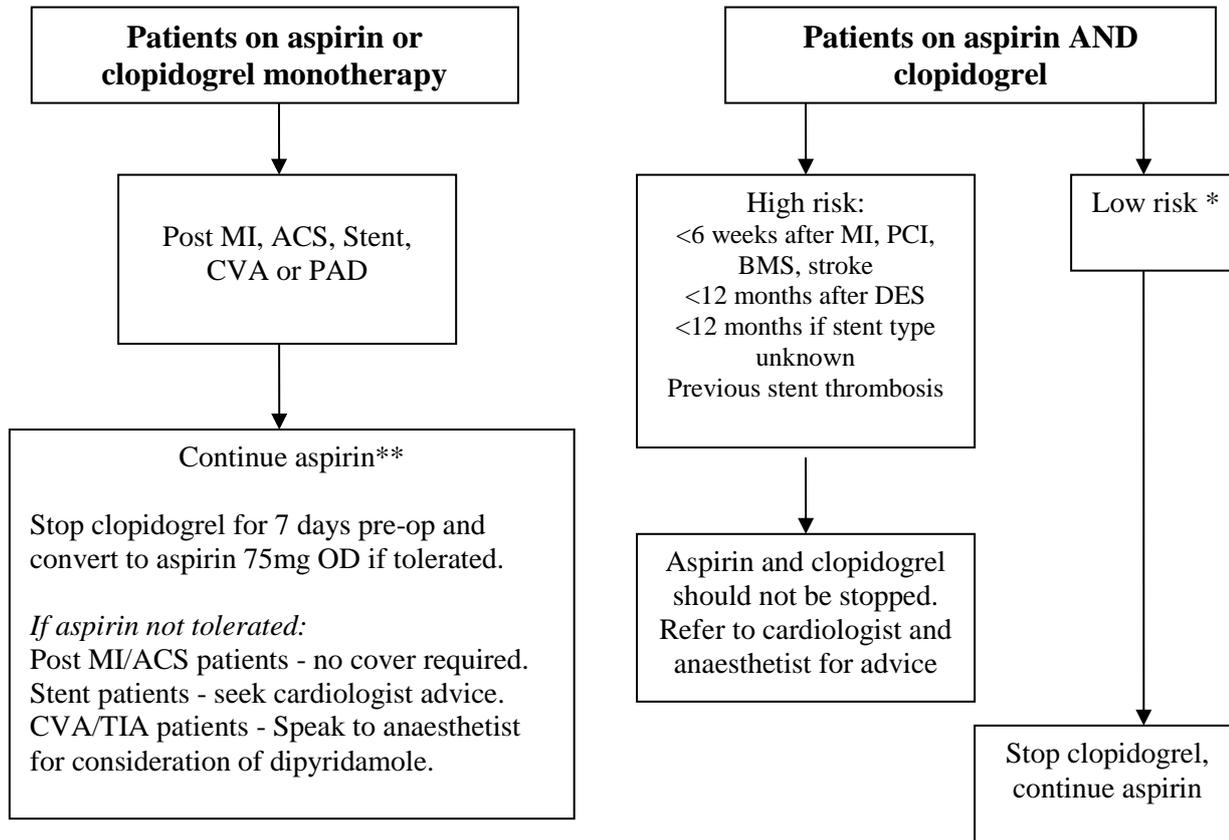
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Peri-operative antiplatelet therapy



Algorithm for pre-operative management of patients taking antiplatelet therapy.

MI = myocardial infarction; ACS = Acute coronary syndrome; PAD = peripheral arterial disease; PCI = percutaneous coronary intervention; BMS = bare metal stent; DES= drug eluting stent.

*Examples of low risk situations: >6 weeks if BMS only implanted, stroke, uncomplicated MI without stent, PCI without stenting.

**The risk/benefit ratio for stopping aspirin or clopidogrel must be evaluated for each case individually (e.g. considering the type of surgical procedure and patient risk factors) For elective patients without high bleeding risk, the risks of stopping aspirin/clopidogrel may outweigh the benefits. If the patient has had previous interventional cardiology procedures (stent), the risk of stopping antiplatelets is usually higher than the bleeding risk. If aspirin/clopidogrel is stopped pre-operatively, early post-operative re-commencement is important.

Appendix 1 – Ward notices

Fasting / Nil by mouth policy for patients before anaesthesia or sedation where consciousness will be impaired.

- No food may be taken for 6 hours before the procedure.
(infants may be given breast milk up to 4 hours before anaesthesia or sedation)
- Water or dilute squash should be consumed up until 2 hours before the procedure. Tea and coffee with a small amount of milk is also acceptable. Essential medicines should also be given at this time. Please refer to the ‘Nil by Mouth and Peri-operative medicines use guideline’ for more information (available on the intranet).
- For 2 hours before the procedure, no food or drinks may be consumed or chewing gum chewed. However, a small amount (30ml) of water to take tablets prescribed as a premed may be permitted.

In practice:

For patients on a **morning list**, they must stop eating at 2am. They may drink water, dilute squash, or tea/coffee with a small amount of milk until 6am. After 6am they should not drink anything unless asked to take a premed by the nursing staff and must not chew gum. If surgery is delayed, patients may be offered a drink up to two hours before the expected time of surgery.

For patients on an **afternoon list**, they must stop eating at 7am. They may drink water, or tea/coffee with a small amount of milk until 11am. After 11am they should not drink anything unless asked to take a premed by the nursing staff and must not chew gum. If surgery is delayed, patients may be offered a drink up to two hours before the expected time of surgery.

Patients listed on an **all day list** should be treated as if they are on a morning list unless the surgeon and anaesthetist decide otherwise. Patients may be offered a drink up to two hours before the expected surgery on the advice of the surgeon/anaesthetist.

Appendix 2

Patient Guidance about starvation / NBM to be inserted into patient invitation letters.

For patient on morning operating lists:

You may be having your procedure under anaesthetic or sedation.

It is very important that you follow these instructions:

We advise you to eat a main meal on the evening before your operation and also have a snack late evening. You are allowed to eat until 2am on the day of your operation.

Drinks such as water, diluted squash, tea and coffee with a small amount if milk are allowed until 6am. It is *recommended* for you to have a drink *before* 6am

For patients on afternoon operating lists:

You may be having your procedure under anaesthetic or sedation.

It is very important that you follow these instructions:

You are allowed to eat until 7am on the day of your operation. We advise you to eat a light breakfast e.g. tea and toast before 7am.

Drinks such as water, diluted squash, tea and coffee with a small amount if milk are allowed until 11am. It is *recommended* for you to have a drink *before* 11am

For patients on all day operating lists:

Use the morning list guidance unless instructed otherwise by anaesthetist and surgeon.

Appendix 3

Guideline for the perioperative management of insulin in Adult diabetic patients undergoing surgery

If only one meal is likely to be missed, give insulin as shown in Table.
If more than one meal is likely to be missed, commence a VRIII and intravenous fluids.

Insulin	Day before admission	Day of surgery (am) [Morning list]	Day of surgery (pm) [Afternoon list]	Whilst VRII in place
Once daily (evening)	Decrease dose by 20%	Check blood glucose on admission	Check blood glucose on admission	Give 80% of usual dose
Once daily morning	Decrease dose by 20%	Reduce usual dose of long acting insulin by 20%. Check blood glucose on admission	Reduce usual dose of long acting insulin by 20%. Check blood glucose on admission.	Give 80% of usual dose
Twice daily fixed mixture	Give usual insulin	Halve usual morning dose. Check blood glucose on admission. Take usual evening dose	Halve usual morning dose. Check blood glucose on admission. Take usual evening dose	STOP
Basal bolus regimen	Give usual insulin	Omit the morning and lunchtime short acting insulins. Stop until eating and drinking normally If the dose of long acting basal insulin is usually taken in the morning then the dose should be reduced by 20%*	Take usual morning insulin dose(s). Omit lunchtime dose. Check blood glucose on admission	STOP short acting insulin and GIVE 80% of usual basal insulin dose
Twice daily separate injections of short acting and intermediate acting	Give usual insulin	Calculate the total dose of both morning insulins and give half as intermediate acting only in the morning. Check blood glucose on admission. Leave the evening meal dose unchanged	Calculate the total dose of both morning insulins and give half as intermediate acting only in the morning. Check blood glucose on admission. Leave the evening meal dose unchanged	STOP
Any other regimen	Consult diabetes team	Consult diabetes team	Consult diabetes team	Consult diabetes team

Check CBG pre-operatively and hourly until the patient is able to eat. If CBG rises to 12mmol/l or more, commence CVRIII and intravenous fluids using CVRIII using the dedicated prescription chart. Once able to eat, recommence usual insulin and discontinue any IV treatment 1 hour after SC insulin injection.

Appendix 4

Guidance on ORAL HYPOGLYCAEMICS Short starvation period (no more than one missed meal)

Oral hypoglycaemic	Day before admission	Day of surgery (AM list)	Day of surgery (PM list)
Acarbose	Take as normal	Omit Morning dose if NBM	Give morning dose if eating
Meglitinide (repaglinidine or nateglinide)	Take as normal	Omit morning dose if NBM	Give morning dose if eating
*Metformin (Procedure not requiring contrast media)	Take as normal	Take as normal	Take as normal
Sulphonylurea (e.g. Glibenclamide, Glicazide, Glipizide)	Take as normal	Omit AM dose	Omit AM and PM doses
DPP IV inhibitor (e.g. sitagliptin, Vidagliptin, Saxagliptin)	Take as normal	Take as normal	Take as normal
GLP-1 analogue (e.g. Exenatide, Liraglutide)	Take as normal	Take as normal	Take as normal
Pioglitazone	Take as normal	Take as normal	Take as normal
SGLT-2 Inhibitors (e.g. Dapagliflozin)	Take as normal	Omit on day of surgery	Omit on day of surgery

Patients expected to miss more than one meal should have a VRIII. However, patients on lifestyle alone or on once daily metformin, should only start a VRIII if their capillary blood glucose levels are greater than 12mmol/L on 2 consecutive occasions.

If patient is commenced on VRII, all oral diabetes medicines should be withheld with the exception of GLP-1 analogues e.g. exenatide.

Appendix 5

Suggested time intervals for antithrombotic administration before and after spinal/epidural or catheter removal

Medicine	Time interval to discontinue before spinal/epidural or catheter removal	Time interval to (re)commence after spinal/epidural or catheter removal
Aspirin and NSAIDs	Nil	Nil
Clopidogrel	7 days	4 hours after catheter removal
Prasugrel	7-10 days	6 hours after catheter removal
Ticagrelor	5 days	6 hours after catheter removal
Cilostazol	42 hours	5 hours after catheter removal
Unfractionated heparin prophylaxis (subcutaneous)	4-6 hours	>1 hour
Unfractionated heparin (iv)	Stop infusion 2-4 hours before (check APTT)	>1 hour
LMWH (prophylactic dose)	12 hours	4 hours
LMWH (treatment dose)	24 hours	4 hours
Fondaparinux (for prophylaxis)	36 hours	6 hours after surgery/CNB 12 hour after catheter removal
Warfarin	INR≤1.5	4 hours after catheter removal
Dabigatran (started postop.)	Use is contraindicated by the manufacturers with postop. Indwelling epidural catheters	6 hours
Rivaroxaban (started postop.)	18 hours	6 hours
Apixaban (started postop.)	20-30 hours	5 hours

Important:

- All patients **must** have a motor and sensory block assessment prior to antithrombotic medication being given
- If the patient has motor or sensory block do not give antithrombotic drugs. Contact the Acute Pain team.
- Clopidogrel should not be given whilst epidural catheter is in place. If this does occur, contact Acute Pain team immediately.



Nil By Mouth

Name:.....

Nil by Mouth from:.....

Regular Mouthcare is Essential





Nil By Mouth

Name:.....

May have food until:.....

May have fluid until:.....

Ensure all required medicines have been given.

Regular mouthcare is essential