Liverpool Heart and Chest Hospital NHS
NHS Foundation Trust

Reference Number: FOI202324//083
From: Private Individual

Date: 23 May 2023

Subject: Medicines Formulary

Q1 The existing web link to your online medicines formulary has disappeared, please could you let me know the correct URL, as I have been unable to find it. If the link has been removed for ongoing maintenance/updating of the formulary and will eventually be re-instated, please could you tell me when this will happen?

A1 We no longer publish the formulary on our website.

Please see attached document for a copy of the formulary: *FOI 083 Drug Formulary Current Sept 2022*

Liverpool Heart and Chest Hospital NHS Foundation Trust
Drug Formulary
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1. GASTRO-INTESTINAL SYSTEM

1.1 Antacids

Magnesium trisilicate mixture
Gaviscon

1.2 Antispasmodics

Mebeverine
Hyoscine butylbromide
Peppermint water

Motility stimulants

Metoclopramide (Maximum of 5 days treatment only as per MHRA restrictions)
Domperidone (Restricted to Cystic Fibrosis and Palliative Care use only)
Erythromycin (unlicensed indication. IV and oral)

1.3 Ulcer healing drugs

H_2 antagonists

Ranitidine

Proton pump inhibitors

Lansoprazole (see below for dosing and duration of therapy)

Indication	Dose of Lansoprazole	Duration of Therapy
Surgical prophylaxis	30mg daily (unlicensed indication)	4 weeks
NSAID GI prophylaxis	30mg daily (unlicensed indication) http://www.npc.nhs.uk/merec/pain/musculo/merec_extra_no30.php#GIR	Duration of NSAID therapy
Benign gastric ulcer	30mg daily	8 weeks
Duodenal ulcer	30mg daily for 4 weeks then 15mg maintenance therapy	Continuous (15mg daily)
GORD	30mg daily for 4 weeks, continued for	Continuous

	a further 4 weeks if not fully healed then maintenance dose of 15-30mg daily	
NSAID associated duodenal or gastric ulcer	As for GORD above	Continuous
Zollinger-Ellison syndrome	60mg daily adjusted according to response (up to 120 mg in divided doses).	Continuous
Eradication of *H Pylori*	Consult antimicrobial guidelines	1 week
Cough associated with GORD	15-30mg twice a day before meals (unlicensed dose) https://www.brit-thoracic.org.uk/document-library/clinical-information/cough/cough-guidelines/recommendations-for-the-management-of-cough-in-adults/	8 weeks and then review

Omeprazole (IV only) for use

- Where IV therapy is required at a dose of 40mg daily
- Prophylaxis of acid aspiration during general anaesthesia at a dose of 40mg on the evening before surgery then 40mg 2-6 hours before surgery**.**
- Dose should be converted to oral lansoprazole if therapy at earliest opportunity if treatment is to continue

Discharge prescriptions MUST state duration of therapy for Proton Pump inhibitors. Consideration should be given to the possible long term side effects of proton pump inhibitors including hypomagnesaemiahttp://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON149774 and hip fracture risk http://www.bmj.com/content/344/bmj.e372.pdf%2Bhtml.

1.4 Antidiarrhoeals

Codeine Phosphate
Loperamide

1.5 Chronic bowel disorders

Consult gastroenterologist

1.6 Laxatives

Bulk forming
Fybogel

Stimulant
Senna
Glycerine suppositories
Docusate sodium
Dantron (present in co-danthramer capsules and suspension) **Terminal care only.**

Faecal softeners
Arachis oil enema

Opioid Receptor Antagonist
Naloxegol 25mg/12.5mg tablet
NICE TA 345 https://www.nice.org.uk/guidance/ta345
PanMersey APC
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS144.pdf?UNLID=107184015201672115583 6

Osmotic laxatives
Lactulose
Gastrografin (CF use only – unlicensed)
Macrogol '3350' sachets
Sodium Citrate enema
Phosphate enema

Bowel cleansing solutions
Klean Prep
Picolax

5HT4 Receptor Agonists
Prucalopride 2mg tablets – for use in chronic constipation in CF unresponsive to other treatments.
(For CF consultant use only). NICE TA211 Chronic constipation in women

Peripheral Opioid-receptor antagonist
Naloxegol 12.5mg and 25mg tablets. Indication: Opioid- induced constipation.
https://www.nice.org.uk/guidance/TA345
plus Pan Mersey hyperlink
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS144.pdf?UNLID=73470564420174615527

Peripherally acting opioid receptor antagonist
Naldemedine 200 micrograms tablets
Technology Appraisal Guidance [TA651]
Pan Mersey APC Statement: GREEN

Laxative Guidelines

Surgical Treatment/Prophylaxis in patients on opioids:

Senna 15mg at night
Lactulose 15ml bd initially and adjusted according to response

Consider changing lactulose to Macrogol '3350' One sachet bd where lactulose is ineffective or a more rapid response is required

Other points to consider

Consider increasing fluid intake and mobility and reviewing other potentially constipating medication (e.g. NSAIDs) in all cases where possible.

All laxatives are contraindicated in bowel obstruction.

Lactulose may take up to 48 hours to have an effect and is therefore not suitable for 'prn' administration or short term use.

Distal Intestinal Obstruction Syndrome in CF
(See policy - Nursing a patient with DIOS in CF)

- Initially give oral Gastrografin 100ml prn up to 500ml (unlicensed) with adequate fluid intake (1 litre of fluid is recommended per 100ml dose)
- If this fails to resolve blockage then commence
  Klean-Prep - one sachet in 1 litre of water every hour orally or via naso-gastric/PEG tube until blockage has resolved (unlicensed) plus Metoclopramide IV 10mg tds. Consider IV paracetamol 1g qds for pain relief (avoid opioid analgesia)

1.7 Haemorrhoid preparations

Anusol (suppositories or cream)

1.9 Intestinal secretions

Ursodeoxycholic acid
Creon
Pancrease

CARDIOVASCULAR SYSTEM

2.1 Positive inotropes

Adrenaline
Dobutamine
Dopamine
Dopexamine (Consultant anaesthetists only)
Isoprenaline (unlicensed use)
Milrinone
Eplerenone
Noradrenaline
Phenylephrine

2.2 Diuretics

Thiazides
Indapamide
Chlortalidone
Bendroflumethiazide
Metolazone
A licensed brand, Xaqua is now available but has different bioavailability to unlicensed version. Please prescribe by brand name and exervcise caution when switching between brands. For more detailed guidance see:
Full MHRA Advice
SPS Information
Joint UKCPA / BSH Information .

Loop diuretics
Furosemide
Bumetanide

Potassium sparing diuretics
Amiloride

Aldosterone antagonists/Mineralocorticoid receptor antagonists (MRA)
Spironolactone
Eplerenone:
Patients intolerant of spironolactone in heart failure NYHA II and LVEF less than 30% or Heart failure post MI with LVEF less than 40%

Combination diuretics
Co-amilofruse

Osmotic diuretics
Mannitol

Sodium glucose linked transporter (SGLT2) inhibitors (heart failure)

Dapagliflozin

NICE TA679

Pan Mersey statement and prescribing support documents

Empagliflozin

NICE TA773

Pan Mersey statement and prescribing support documents

2.3 Anti-arrhythmics

Adenosine
Amiodarone
Disopyramide
Flecainide
Lidocaine
Mexiletine
Propafenone
Quinidine (unlicensed use)
Verapamil
DigoxinDronedarone (Dronedarone for the treatment of non-permanent atrial fibrillation NICE TA197)

2.4 Beta blockers

Indication	Preferred drug	Other options
Secondary prevention after myocardial infarction	bisoprolol	propanolol, metoprolol
Angina	bisoprolol	atenolol, metoprolol, propranolol
Hypertension (uncomplicated)	Not indicated for first line use. In combination therapy: atenolol, bisoprolol, propranolol. For intravenous treatment after aortic dissection use labetalol	
Heart failure	bisoprolol	carvedilol, metoprolol, nebivolol
Treatment of SVT	metoprolol	esmolol
Prophylaxis of SVT	metoprolol	propranolol, bisoprolol (unlicensed indication), atenolol, sotalol (seek consultant advice)
Life-threatening arrhythmias/ Recurrent ICD shocks	Bisoprolol (unlicensed indication)	Esmolol (unlicensed indication)

Prophylaxis of AF post CABG	bisoprolol	
Treatment of AF post CABG	Amiodarone 1st line (this should be reviewed at OPD and if patient still in AF consider alternative treatment options due to adverse side effect profile) Sotalol 80mg BD	
Treatment of Long QT Syndrome (unlicensed indication) / CPVT	Nadolol 40mg and 80mg tablets	

See also Cheshire and Merseyside Heart Failure Pathway

2.5 Drugs affecting the renin-angiotensin system and other antihypertensives

Vasodilator antihypertensives
Sodium nitroprusside
Hydralazine
Diazoxide

Sildenafil
Patients with pulmonary arterial hypertension should normally be referred to the regional specialist centre (Sheffield). Any intention to treat a patient locally should be discussed with the chief pharmacist/cardiology pharmacist.

Centrally acting antihypertensives
Methyldopa
Moxonidine

Alpha blockers
Doxazosin (not MR)
Phentolamine
Phenoxybenzamine

Angiotensin Converting Enzyme (ACE) inhibitors
Ramipril
Perindopril

Angiotensin II receptor antagonists

Indication	Preferred Drug	Other Drugs
Hypertension	Candesartan	Losartan
Left Ventricular dysfunction (when ACE-inhibitor not tolerated because of cough)	Candesartan	

Sacubitril/Valsartan tablets (Entresto®)
Pan Mersey APC Sacubitril/Valsartan Statement (includes prescribing support documents)
NICE TA 388

2.6 Nitrates

Isosorbide mononitrate (10mg tabs, 20mg tabs, 60mg slow release preparations only)
Glyceryl trinitrate (Buccal preparation is unlicensed)

2.7 Calcium channel blockers

Amlodipine
Diltiazem
Verapamil

2.8 Ivabradine.

Antianginal- for the treatment of stable angina pectoris for patients in sinus rhythm who have contraindication or intolerance of beta blockers
Heart failure (NICE TA267)

2.9 Other anti-anginal drugs

Nicorandil
Ranolazine (consultant use only for the treatment of stable angina pectoris)

2.10 Anticoagulants (oral) – See Anticoagulation Policy and EP anticoagulation policy

Vitamin K antagonists
Warfarin
Acenocoumarol
Phenindione

Direct oral anticoagulants

It is for the prescribing clinician to determine which DOAC(s) are clinically appropriate for an individual patient based upon the relevant NICE technology appraisal guidance. For patients with atrial fibrillation, NICE NG196 provides guidance on when to consider changing therapy.

For patients commencing treatment for AF: subject to the criteria specified in the relevant NICE technology appraisal guidance, clinicians should use edoxaban where this is clinically appropriate. If edoxaban is contraindicated or not clinically appropriate for the specific patient

then, subject to the criteria specified in the relevant NICE technology appraisal guidance, clinicians should then consider rivaroxaban first, then apixaban or dabigatran.

Commissioning recommendations for national procurement for DOACs (January 2022)
Dabigatran
Venous thromboembolism (NICE TA 327)
Atrial fibrillation **- NICE TA249**
Idarucizumab **-** specific reversal agent for dabigatran when rapid reversal of its anticoagulant effects is required for emergency surgery/urgent procedures and in life-threatening or uncontrolled bleeding.

Rivaroxaban for the treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism - NICE TA 287
(Rivaroxaban for stroke prevention in atrial fibrillation NICE TA256)
(Rivaroxaban for preventing atherothrombotic events in people with coronary of peripheral artery disease NICE TA607)
(Rivaroxaban for treatment and prevention of venous thromboembolism NICE TA261)
(Rivaroxaban for preventing adverse outcomes after acute management of acute coronary syndrome NICE TAG335)

Apixaban
Treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism -NICE TA 341
Atrial fibrillation (NICE TA275)

Edoxaban
Deep vein thrombosis and pulomonary embolism (NICE TA354)
Atrial fibrillation (NICE TA355)

Andexanet alfa for reversing anticoagulation from apixaban, rivaroxaban or edoxaban:
NICE TA397
Pan Mersey

2.11 Anticoagulants (parenteral) See Anticoagulation Policy and EP anticoagulation policy

Heparin (unfractionated)
Enoxaparin (Low Molecular Weight Heparin)
Danaparoid Sodium (in place of heparin where heparin induced thrombocytopenia suspected - refer to Trust HITT policy)
Bivalirudin For patients undergoing
primary PCI for ST-elevation Myocardial Infarction
(**Bivalirudin for the treatment of Myocardial Infarction (persistent ST-segment elevation) NICE TA230)**

Prasugrel for the treatment of acute coronary syndromes with percutaneous coronary intervention – **NICE TAG317 – include no diabetic patients, being addressed**

2.12 Antiplatelet drugs

Aspirin
Clopidogrel (see below)
Prasugrel **(NICE TA317)**

Ticagrelor **(NICE TA236)**

See regional antiplatelet policy below:

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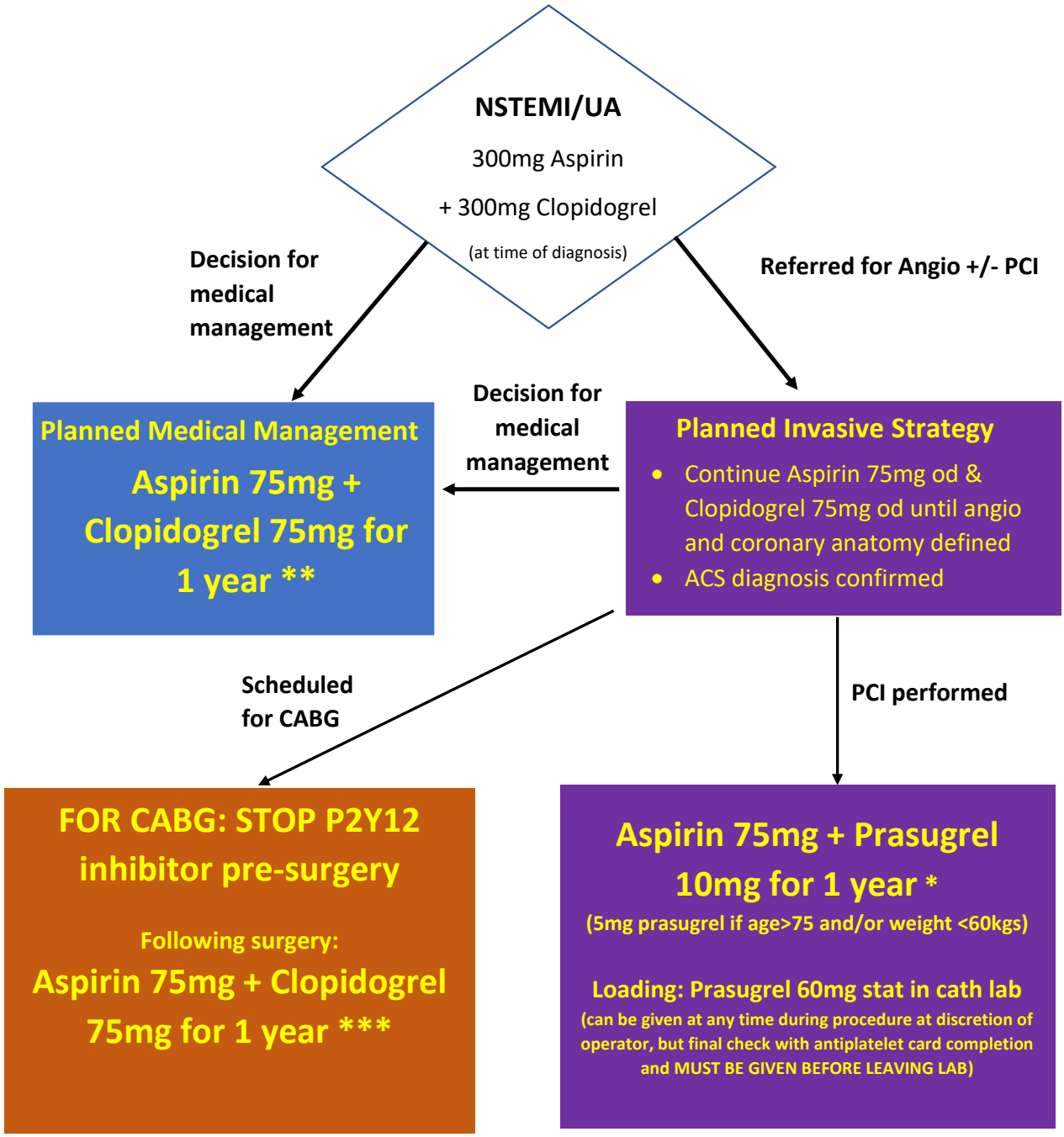
Drug Formulary

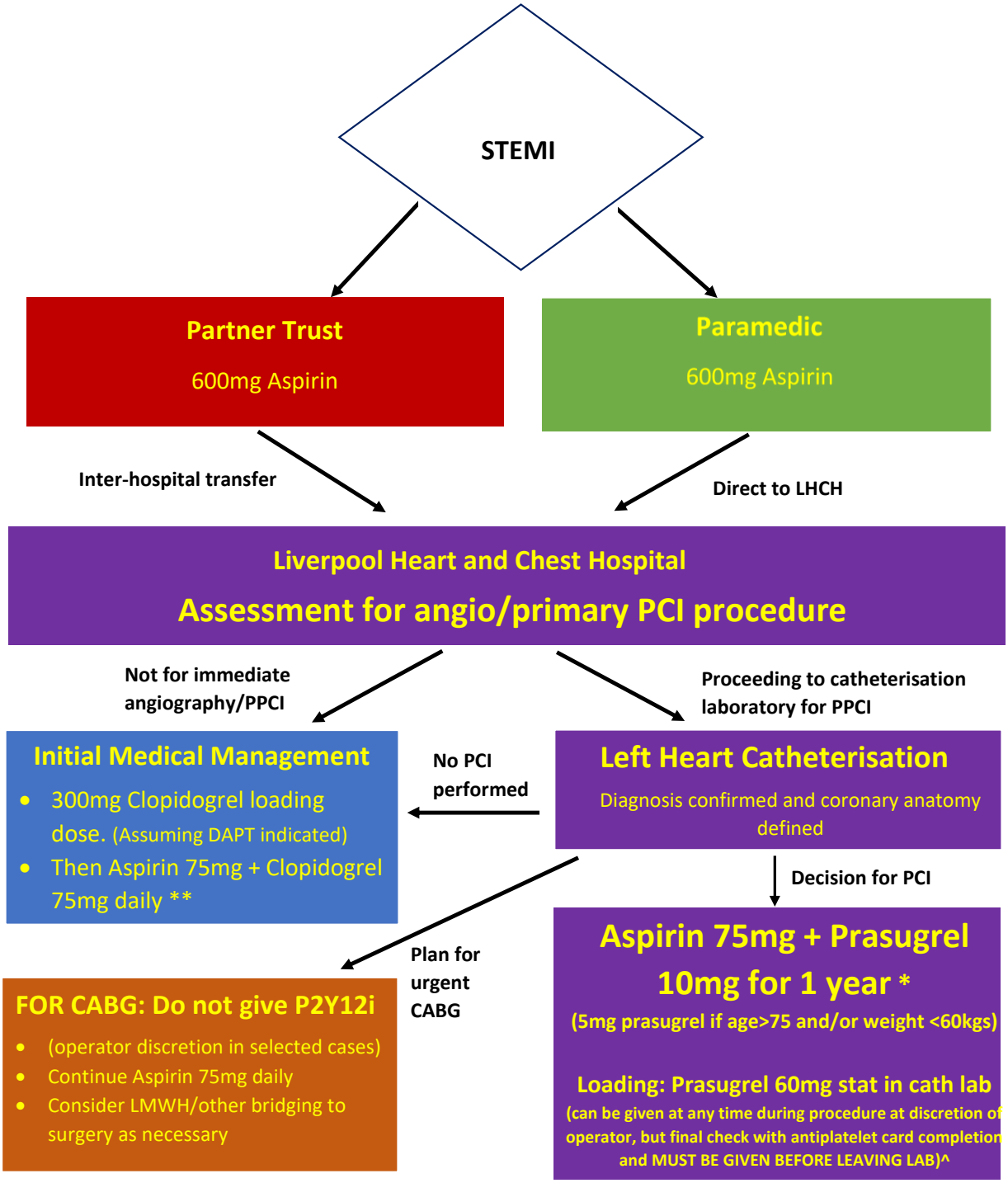
Antiplatelet protocol for patients presenting via ACS pathway



- Ideally stop p2y12 inhibitor at least 5 days pre-coronary artery bypass surgery (CABG)
- * If absolute contraindication to prasugrel OR operator determined relative contraindication (see guidance notes) use Clopidogrel 75mg od (with 600mg in lab loading dose)
- **Ticagrelor 90mg bd is an option for medically treated ACS if high ischaemic and low bleeding risk
- ***Prasugrel or Ticagrelor are options after CABG in selected cases (*see guidance notes)
- DAPT duration can be titrated to bleeding/ischaemic risk, consider PRECISE-DAPT score (*see guidance notes)

Liverpool Heart and Chest Hospital NHS Foundation Trust
Drug Formulary

Antiplatelet protocol for patients presenting via PPCI pathway



- * If absolute contraindication to Prasugrel OR operator determined relative contraindication (see guidance notes) use Clopidogrel 75mg od (with 600mg in lab loading dose)
- **Ticagrelor 90mg bd is an option for medically treated ACS if high ischaemic and low bleeding risk
- DAPT duration can be titrated to bleeding/ischaemic risk, consider PRECISE-DAPT score (*see guidance notes)
- In selected cases, such as previous coronary intervention, known IHD or unequivocal STEMI diagnosis, consider Prasugrel 60mg loading dose pre-procedure

Liverpool Heart and Chest Hospital NHS Foundation Trust
Drug Formulary

GUIDANCE NOTES ON ANTIPLATELET CHOICES

The following guidance is for patients with confirmed ACS considered appropriate for dual antiplatelet therapy (DAPT). All guidance is subject to clinical judgement and 'personalised' decisions on antiplatelet therapy, weighing up ischaemic and bleeding risk in an individual patient.

1. Choice of antiplatelet agent

a. Patients for medical management of ACS only (i.e. no PCI or CABG)
   i. First line therapy is Aspirin 75mg and Clopidogrel 75mg.
   ii. Ticagrelor 90mg bd in addition to Aspirin 75mg may be considered as an option in cases where Clopidogrel is contraindicated or undesirable (e.g. genuine allergy or known non-responder).
   iii. Prasugrel should not be used in patients being treated medically, with no knowledge of coronary anatomy, unless already established on this agent due to previous interventions.
   iv. In genuine Aspirin allergy cases, Clopidogrel 75mg monotherapy should be used.

b. Patients undergoing PCI (UA, NSTEMI or STEMI)
   i. First line therapy is Aspirin 75mg and Prasugrel 10mg following PCI (reduce Prasugrel dose to 5mg if age >75 or weight <60kg). However, HBR (high bleeding risk) patients maybe more suitable for Clopidogrel or shortened DAPT.
   ii. Prasugrel absolutely contraindicated in previous stroke/ TIA and use of Clopidogrel (or Ticagrelor) is advisable in these patients (see below for other contraindications/ cautions for use of Prasugrel)
   iii. Second line is Aspirin 75mg and Clopidogrel 75mg.
   iv. Aspirin 75mg and Ticagrelor 90mg bd as a third line option may be considered where both Clopidogrel and Prasugrel are contraindicated or undesirable.
   v. In cases of genuine Aspirin allergy: Clopidogrel 75mg monotherapy should be considered first line. Ticagrelor 90mg bd monotherapy may be considered in individual cases on individual risk/benefit, although this is currently an off licence indication.

c. Patients undergoing CABG
   i. Generally, P2Y12i is stopped pre CABG (5-7 days) but decision should be made on individual case basis depending on clinical situation.
   ii. After CABG the 1st choice of DAPT should be Aspirin and Clopidogrel for 1 year.
   iii. Prasugrel or Ticagrelor (instead of Clopidogrel) can be considered in selected cases on risk benefit/balance after CABG (e.g. younger diabetic patients with low bleeding risk). Please note this is an off-licence indication for Prasugrel.

d. Patients with concomitant or pre-existing AF (or other indication for long term anticoagulation)
   i. Antiplatelet/antithrombotic strategies should be based on individualised assessments of thrombotic and bleeding risk. (Lip GY et al. Eur Heart J 2014;35:3155–3179).
   ii. Ticagrelor and Prasugrel should not be used in combination with oral anticoagulants (i.e. NOACs or warfarin) or as part of "triple therapy".
   iii. Comprehensive guidance on strategy choices in these patients is beyond the scope of this guidance document but generally patients who undergo revascularisation for ACS (and require concomitant anticoagulation) should receive either dual therapy (e.g. clopidogrel + OAC) from outset or a short period of triple therapy (aspirin + clopidogrel + OAC) for 1-3 months initially depending on ischaemic/bleeding risk balance. Patients who are medically managed should not be prescribed triple therapy.

e. Patients who are ventilated or nil by mouth
   i. It may not be possible to administer oral Aspirin, Prasugrel or Clopidogrel in a timely manner. Consider IV/PR Aspirin pre procedure. If PCI performed and oral route not available, consider dispersible Ticagrelor via NG tube as soon as possible.

Patients in whom Prasugrel generally desirable:

- STEMI presentation
- Stent thrombosis event
- Other ACS events occurring whilst taking Clopidogrel
- Diabetic
- Previous MI: particularly recurrent ischaemic events
- Multiple/complex stenting

Tirofiban

2.13 Fibrinolytic drugs

Tenecteplase (TNK-tpa)

Administer over 5-10 seconds according to weight;

Weight (kg)	Dose (mL)
<60	6
60-69	7
70-79	8
80-89	9
90+	10

Co-therapy: IV heparin (minimum of 48hrs)
Weight <67 kg -4000 IU bolus then 800 IU/hr infusion (0.8ml/h of 1000 units/ml)
Weight > 67kg -5000 IU bolus then 1000 IU/hr infusion (1ml/h of 1000 units/ml)

Target APTT: 50-75s (1.5-2.5 times control)

Alteplase (usually reserved use for pulmonary embolism only unless tenecteplase is unable to be sourced)

Please note alteplase is recommended by NICE in acute ischaemic stroke (NICE TA 264). Alteplase is not approved for use for this indication at LHCH as all patients presenting with acute ischaemic stroke must be transferred to their local specialist centre for thrombolysis

2.14 Antifibrinolytic drugs

Aprotinin
Etamsylate
Tranexamic acid

2.15 Lipid lowering drugs

Anion-exchange resins
Colestyramine

Fibrates
Bezafibrate MR
Fenofibrate

Statins
Simvastatin
Atorvastatin

Rosuvastatin

PCSK 9 inhibitors
Alirocumab

NICE TA 393Pan Mersey statement

Evolocumab

NICE TA 394Pan Mersey statement (no longer recommended)

http://www.panmerseyapc.nhs.uk/recommendations/documents/PS147.pdf?UNLID=734694823201746122456

Cholesterol Absorption Inhibitors
Ezetimibe for treating primary heterozygous-familial and non-familial hypercholesterolaemia
https://www.nice.org.uk/guidance/TA385
PanMersey Ezetimibe hyperlinks
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS137.pdf?UNLID=734694823201746121252
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS175.pdf?UNLID=734694823201746121252

Other agents
Bempedoic acid with ezetimibe for treating primary hypercholesterolaemia or mixed dyslipidaemia
https://www.nice.org.uk/guidance/ta694
Pan Mersey statement
Inclisiran for treating primary hypercholesterolaemia or mixed dyslipidaemia
NICE TA733
Pan Mersey statement

3. RESPIRATORY SYSTEM

3.1 Bronchodilators

3.1.1 Selective beta2 agonists

Short acting beta2 agonists

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Salbutamol	Generic CFC free MDI Ventolin Accuhaler Salamol Easibreathe breath activated MDI	100microgram 200microgram 100microgram	200 microgram prn	200 microgram qds and prn

	Salbutamol easyhaler Salbutamol nebules Salbutamol injection	200microgram 2.5mg, 5mg 500microgram /ml	 2.5-5mg qds Consult chest physician	 2.5-5mg qds Consult chest physician
Terbutaline	Bricanyl turbohaler Bricanyl nebules Bricanyl injection	500microgram 5mg 500 microgram/ml	500microgram prn 5-10mg qds Consult chest physician	500microgram qds and prn 5-10mg qds Consult chest physician

Long acting beta2 agonists (see also combination steroid inhalers)

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Salmeterol	Salmeterol CFC free MDI Serevent Accuhaler	25microgram 50microgram	50microgram bd (only in combination with steroid inhaler)	50microgram bd
Formeterol	Oxis Turbohaler	6mg, 12mg	12microgram bd (only in combination with steroid inhaler)	12microgram bd
Indacaterol	Onbrez Breezhaler	150microgram, 300microgram	Unlicensed	150-300 microgram od

Oral beta2 agonists

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Bambuterol	Tablets	10mg	Consult chest physician	Consult chest physician

3.1.2 Antimuscarinics (anticholinergics) and LAMA/LABAs

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Ipratropium	Atrovent MDI	20microgram	Not routinely used	20-40 microgram qds

	Ipratropium nebules	250microgram, 500microgram	250-500 microgram qds	250-500 microgram qds
Tiotropium	Spiriva handihaler plus inhalant capsule	18microgram	Not licensed for treatment of asthma	18microgram od
	Braltus via Zonda Inhaler	10microgram	Not licensed for treatment of asthma	10microgram od
	Spiriva Respimat metered inhaler	2.5microgram	5microgram od	5microgram od
Aclidinium Bromide (Eklira Genuair®)	Dry powder inhaler	400microgram	Not licensed for treatment of asthma	400microgram inhaled TWICE daily. For maintenance treatment of chronic obstructive pulmonary disease.
Glycopyrronium Bromide (Seebri Breeshaler®)	Capsules for inhalation via Breezhaler inhaler device	50microgram	Not licensed for treatment of asthma	50microgram ONCE daily. Second line maintenance treatment of chronic obstructive pulmonary disease.
Umeclidinium (Incruse Ellipta®)	Dry powder inhaler	55microgram	Not licensed for treatment of asthma	55 microgram ONCE a day
Aclidinium with formoterol (Duaklir Genuair®)	Dry powder inhaler	Aclidinium 340 micrograms with formoterol 12 micrograms per inhalation	Not licensed for treatment of asthma	ONE inhalation TWICE a day
Glycopyrronium with indacaterol inhaler (Ultibro Breezhaler®)	Capsules for inhalation via Breezhaler inhaler device	Indacaterol 85 micrograms with glycopyrronium	Not licensed for treatment of asthma	Inhale the contents of ONE capsule ONCE a day

		43 micrograms per inhalation		
Umeclidinium bromide with vilanterol inhalation powder (Anoro Ellipta®)	Dry powder inhaler	Umeclidinium 55 micrograms with vilanterol 22 micrograms per inhalation	Not licensed for treatment of asthma	ONE inhalation ONCE a day
Tiotropium with Olodaterol (Spiolto Respimat®)	Inhalation solution	tiotropium 2.5micrograms with olodanterol 2.5micrograms per inhalation	Not licensed for treatment of asthma	TWO puffs (5 micrograms) once daily

3.1.3 Theophylline

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Theophylline	Uniphyllin continus M/R tablets	200mg, 300mg, 400mg	200-400mg bd	200-400mg bd
Aminophylline (multiply by 0.8 for equivalent theophylline dose)	Injection for IV infusion	25mg/ml	See notes below	See notes below
	Phyllocontin tablets	225mg	225-450mg bd	225-450mg bd

Due to variation in rates of absorption, modified release preparations must be prescribed by brand.

Dose of Aminophylline intravenous infusion:

- Loading dose (only if not previously treated with oral theophylline):
  - 250-500mg (5mg/kg) over 20 minutes
- Maintenance dose (if on oral theophylline check levels first)
  - 0.5mg/kg/hr adjusted according to plasma concentration
- Higher doses may be used in Cystic Fibrosis

Therapeutic drug level monitoring of theophylline/aminophyline:-

- Therapeutic range: 10-20mg/l
- Time to steady state: Usually 24-48 hrs (unless loading dose given or previously on oral). Levels should not be taken before 48hours unless an IV loading dose has been given or previously on oral in which case 24hours is sufficient.

Oral theophylline levels (usual range 10-20mg/l) should be monitored 4 to 7 days after starting therapy. Levels should ideally be taken immediately before the next dose or at 4 hours post dose.

The theophylline dose should be reduced if macrolide or fluoroquinolone antibiotics (or other drugs known to interact) are prescribed for an exacerbation (contact pharmacy for advice)

3.1.5 Inhaler devices

Both Volumatic (for use with Clenil, Flixotide, Seretide, Serevent and salbutamol MDIs) and Space Chamber Plus (for use with all MDI inhalers) spacer devices are available from pharmacy to assist drug delivery. Patients should be advised to clean their spacer monthly with detergent and allow to air dry. Spacers should be replaced at least every 12 months.
Haleraids are available from pharmacy for patients who have impaired hand strength and are prescribed an MDI. These patients should initially be assessed by the respiratory specialist nurse to ensure that an MDI is the most appropriate device.

3.2 Inhaled Corticosteroids (prescribe by brand)

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Beclometasone	Qvar CFC free MDI Qvar CFC free autohaler NB incompatible with spacer Qvar 50 microgram is equivalent to 100microgram Clenil CFC free MDI (non formulary) Clenil Modulite (preferred choice in asthma)	50 microgram, 100microgram 50microgram 100microgram 200microgram 250microgram	100-400 microgram bd 400-800micrograms daily in 2-4 divided doses	Not normally used. Not normally used.
Budesonide	Pulmicort turbohaler Easyhaler	100micrograms 200micrograms 400micrograms 100micrograms 200icrograms 400micrograms	100-800 microgram bd	Not licensed in COPD

Patients receiving high dose inhaled steroids (800microgram of beclometasone or equivalent) via a metered dose inhaler should also be prescribed an

appropriate spacer device (Volumatic/space chamber plus) to prevent oropharyngeal side effects. Consult the respiratory specialist nurse or pharmacy for advice on appropriate inhaler devices for individual patients.

Combination steroid plus long acting beta2 agonist inhalers (prescribe by brand)

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Fluticasone plus salmeterol	Seretide CFC free evohaler (MDI) Seretide Accuhaler	50/25 microgram, 125/25 microgram, 100/50 microgram, 250/50 microgram, 500/50 microgram	2 puffs bd One blister bd	Not licensed in COPD 500/50 (one blister) bd
Budesonide plus formeterol	Symbicort turbohaler Fobumix Easyhaler	100/6, 200/6, 400/12 80/4.5 160/4.5 320/9	100/6 bd to 800/24 bd 80/4.5 – 320/9 2 puffs daily	200/6 – 400/12 bd 80/4.5 not licenced. 160/4.5 2 puffs bd or 320/9 1 puff bd
Beclometasone diproprionate plus formeterol	Fostair MDI Fostair NEXT DPI	100/6 200/6	1-2 puffs bd	2 puffs bd (100/6)
Fluticasone furoate* plus vilanterol	Relvar Ellipta	92/22 184/22	92/22 od 184/22 od	92/22 od

*Fluticasone furoate 100micrograms once daily is approximately equivalent to fluticasone propionate 250micrograms twice daily.

Combination steroid plus long acting beta2 agonist inhalers and long acting antimuscarinic (prescribe by brand)

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Fluticasone	Trelegy DPI	92/55/22	Not	1 puff od

furoate/vilanterol/ umeclidinium			licensed in asthma	
Beclometasone dipropionate/formetorl fumarate/glycopyrronium	Trimbow MDI	100/6/10 (87/5/9)	Not licensed in asthma	2 puffs bd

Seretide 250/25 microgram evohaler has been removed from the hospital formulary as it is expensive and not licensed in COPD. Any new prescriptions for this will be queried by pharmacy and only supplied if there is no other device the patient can tolerate as determined by the respiratory specialist nurse.

3.3 Leukotriene Receptor Antagonists

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Montelukast	tablets	10mg	10mg in the evening	Not licensed in COPD

MANAGEMENT OF ACUTE SEVERE ASTHMA IN ADULTS

Patients with acute severe asthma will not normally present at LHCH. If further guidance is required please refer to the BNF.

STEPWISE MANAGEMENT OF CHRONIC ASTHMA IN ADULTS

Refer to Pan Mersey Guidelines:

https://www.panmerseyapc.nhs.uk/media/2171/asthma_adult.pdf

***Prescribers should note the contents of NICE TA138 Inhaled corticosteroids for the treatment of chronic asthma in adults and children over 12 years before prescribing**

Pharmacological therapy of stable COPD

Refer to Pan Mersey Guidelines:

https://www.panmerseyapc.nhs.uk/media/2237/copd.pdf?UNLID=683997857201974155 15

Smoking

All COPD patients still smoking should be referred to the Smoking Cessation Advisor for appropriate support and advice regarding quitting. Nicotine replacement therapies and varenicline are available for prescribing. NICE TA123

Nebulised bronchodilator therapy in stable COPD

Nebulised bronchodilator therapy should only be considered in patients with distressing or disabling breathlessness despite maximal inhaler therapy and should not be continued unless there is a perceived benefit. Assess individual and/or carer's ability to use the nebuliser before prescribing. Patients should be referred to the respiratory specialist nurses for further support. Patients commencing ipratropium nebules should have all anticholinergic inhaler therapy (eg tiotropium) stopped since there is no additional benefit.

Oral corticosteroids

Maintenance oral corticosteroid therapy is not normally recommended and should only be prescribed in advanced COPD in patients whose treatment cannot be stopped after an exacerbation. The dose should be kept as low as possible and osteoporosis prophylaxis therapy considered.

Theophylline

Only offer after trials of short- and long-acting bronchodilators or to patients who cannot use inhaled therapy (see section 3.1.3)

Mucolytics

Mucolytics (Carbocisteine) can be considered for patients with chronic productive cough. See below.

Roflumilast

Drug	Formulation	Strength	Usual dose Asthma	Usual dose COPD
Roflumilast	tablets	250micrograms 500micrograms	Not licensed in asthma	250micrograms once daily for 28 days then 500micrograms once a daily

***Prescribers should note the contents of NICE TA461 –Roflumilast for treating chronic obstructive pulmonary disease before prescribing**

Hospital Management of Severe Exacerbations of COPD

Refer to https://www.nice.org.uk/guidance/ng115/chapter/Recommendations

SOLUTIONS FOR NEBULISATION

Patients with COPD and carbon dioxide retention ($PaCO_2$ > 6.0Kpa) should have their nebuliser therapy driven via an air cylinder or a nebuliser compressor. If the hypercapnic patient is so hypoxic that they need continuous oxygen then this should be administered via nasal cannula and the nebuliser driven from an air cylinder or compressor concurrently. Patients without CO_2 retention can use either air or oxygen safely (unless the patient has acute asthma in which case oxygen must be used) but oxygen as a driving gas should be discontinued immediately after medication is nebulised. (See nebulisation guidelines for further information on preparations and administration)
Patients not previously using nebulised therapy should only be discharged on such treatment on the advice of a respiratory physician or the Respiratory Nurse Specialist.

3.4 Antihistamines

Drug	Formulation	Strength	Dose
Chlorphenamine	Tablets Oral solution	4mg 2mg/5ml	4mg 4-6hourly. Max 24mg in 24 hours
Cetirizine	Tablets	10mg	10mg daily

3.5 Respiratory stimulants

Doxapram - Consult SPC for dosing details. For use on consultant recommendation only.

3.6 Oxygen

Refer to 'Oxygen Prescription and Administration in Adults Including Emergency Indications' Policy available on the intranet.

3.7 Mucolytics

Drug	Formulation	Strength	Dose
Dornase Alfa	Pulmozyme nebulisation solution	2.5mg	2.5mg daily (Cystic Fibrosis only)
Sodium Chloride	Nebules	3% or 7%	4mL up to twice daily
Mannitol	Inhalation powder, hard capsules	40mg	400mg twice daily (Cystic Fibrosis only) NICE TAG 266 Mannitol dry

			powder for inhalation for treating cystic fibrosis
Acetylcysteine (NACSYS) Prescribe by brand	Effervescent tablet	600mg	600mg daily
Carbocisteine	Capsules Syrup	375mg 250mg/5ml	375-750mg tds
Erdosteine	Capsules	300mg	300mg TWICE daily for up to 10 days.

3.8 Cough preparations

Drug	Formulation	Strength	Dose
Simple Linctus	Linctus Sugar Free Linctus	125mg/ml	5ml up to QDS
Codeine	Oral solution	15mg/5ml	5-10ml 3-4 times a day

4. CENTRAL NERVOUS SYSTEM

4.1 Hypnotics and anxiolytics

Benzodiazepines and other hypnotics should not be routinely prescribed for anxiety or night sedation. If treatment is considered necessary then they should be prescribed on a 'prn' basis only and be reviewed regularly.
Owing to the possibility of addiction, patients not previously taking benzodiazepines prior to admission should not receive them on discharge.

Hypnotics
Zopiclone - licensed for short term use only. Follow advice as for benzodiazepines above
Temazepam (controlled drug)
Melatonin (short-term use only)

Anxiolytics
Diazepam
Lorazepam
Chlordiazepoxide (alcohol withdrawal – see below)

4.2 Drugs used in psychoses

Antipsychotic drugs
Haloperidol IV (delirium in Critical Care only)
Quetiapine (delirium only)
Risperidone (delirium in Critical Care only)

For all other indications consult an appropriate psychiatric specialist

Antimanic drugs
Lithium (Priadel) (mania) (Click here to view Lithium therapy policy**)**

4.3 Antidepressants

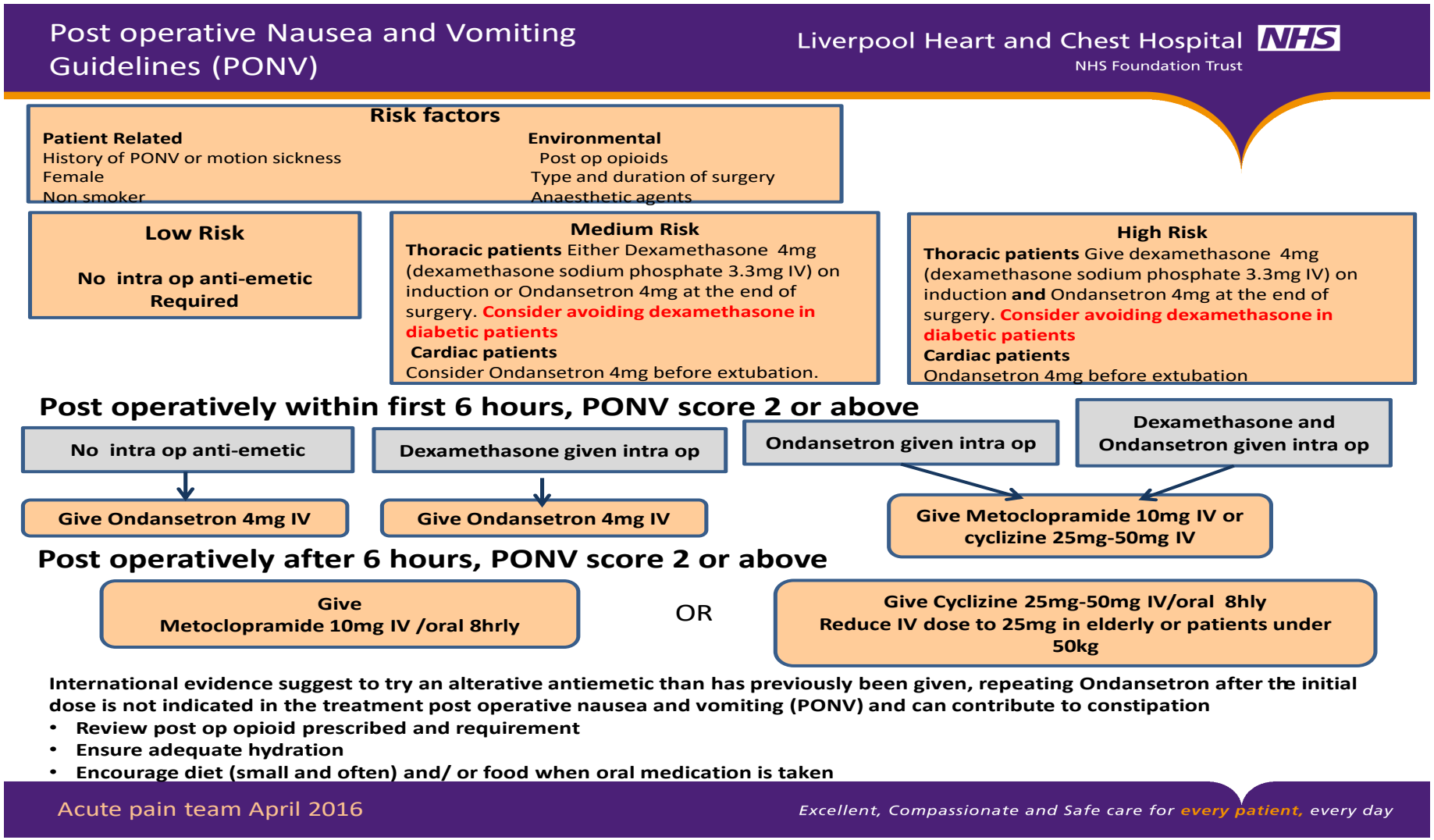
Amitriptyline
Fluoxetine
Sertraline
For newly suspected cases please seek specialist advice.

4.4 Nausea and vertigo

Metoclopramide (Maximum of 5 days treatment only as per MHRA restrictions)
Cyclizine
Prochlorperazine
Betahistine
Ondansetron (limited indications, post-operative nausea and vomiting only)
Levomepromazine 25mg/ml injection (Management of the terminally ill patient – anti-emetic in Palliative Care)

Consult the following algorithm for the management of post-operative nausea and vomiting' to 'See Acute Pain policy for the management of post-operative nausea and vomiting.

Algorithm for the management of post-operative nausea and vomiting



4.6 Analgesics – Also see Acute Pain Protocol

Non-Opioid Analgesics • Paracetamol	**Non-Steroidal Anti-inflammatory drugs (NSAIDS)** • Ibuprofen • Naproxen • Ketorolac
Opioids Analgesics • Codeine phosphate • Dihydrocodeine • Diamorphine • Morphine • Fentanyl patches/sublingual • Tramadol • Oxycodone • Buprenorphine Patches/Sublingual	**Neuromodulators** • Pregabalin • Gabapentin • Ketamine

Compound oral analgesics, such as paracetamol plus an opioid, should not be prescribed because of the inflexibility in the dosage of such products. If an opioid analgesic is considered necessary then a single ingredient preparation should be used, such as dihydrocodeine or codeine phosphate tablets.

LHCH Acute Pain Analgesia Ladder

+ Adjuvant

- Ketorolac IV
- Diclofenac PR
- Oral Ibuprofen
- Neuropathic agents
- Pregabalin, Gabapentin
- Tramadol oral / IV
- Local anaesthetic Blocks (Levobupivacaine)
- Ketamine Infusion (on POCCU/HDU only)
- Oral Ketamine (inpatient use only)

STEP 1

MILD

- Paracetamol

STEP 2

MODERATE

- Codeine Phosphate
  or
  Dihydrocodeine
- Paracetamol

STEP 3

SEVERE

- Epidural (Fentanyl Levobupivacaine)
  or
  Morphine/ Oxycodone (PCA)
- +/- Paravertebral Infusion or Local anaesthetic Infusion
  or
  Oxycodone (Oxycontin MR & Oxynorm IR)
  + Paracetamol

LHCH Acute Pain Analgesia Ladder

Prophylaxis of migraine
Pizotifen

4.7 Antiepileptics

Carbamazepine
Phenytoin
Sodium valproate

Status epilepticus
Diazepam
Phenytoin

4.8 Parkinsonism and related disorders

Contact appropriate specialist in the management of Parkinson's disease and related disorders

Relief of intractable hiccup
Chlorpromazine
Haloperidol

4.9 Drugs used in substance dependence

Methadone (Addicts must be registered with the Home Office)
Nicotine (Various preparations available. Refer to smoking advisor)
Varenicline NICE TA123

Management of alcohol withdrawal – See Acute Alcohol Withdrawal-Assessment and Management Policy

Chlordiazepoxide
Diazepam
Lorazepam
Thiamine
Vitamin B substances with ascorbic acid injection (Pabrinex)

5. INFECTIONS

Please refer to the Antimicrobial Policy and NICE TA158 Oseltamivir, amantadine (review) and zanamivir for the prophylaxis of influenza and TA168 Amantadine, oseltamivir and zanamivir for the treatment of influenza

Colistimethate sodium and tobramycin dry powders for inhalation for treating pseudomonas lung infection in cystic fibrosis (TA276) - **https://www.nice.org.uk/guidance/ta276**

6. ENDOCRINE SYSTEM

6.1 Drugs used in diabetes

6.1.1 Insulins

Type	Drug	Brand	Notes
Short acting insulins	**Soluble Insulin**	**Actrapid**	**For use in management of acutely ill or peri-procedural diabetic/non-diabetic patients requiring insulin only.**
	Insulin Aspart Insulin Glulisine Insulin Lispro	**Novorapid Apidra Humalog**	**For use in CF or Diabetes Specialist Nurse advice only**
Long acting insulins	**Insulin Detemir Insulin Glargine NICE TA53**	**Levemir Lantus**	**For use in CF or Diabetes Specialist Nurse advice only**

Intermediate acting insulins	Biphasic Insulin Aspart Biphasic Insulin Lispro	NovoMix 30 Humalog Mix 25	For use in CF or Diabetes Specialist Nurse advice only

6.1.2 Oral Diabetic Drugs

Type	Drugs Available
Sulfonylureas	Gliclazide
Biguanides	Metformin
	Metformin oral Solution
	Metformin M/R
Dipeptidylpeptidope – 4 inhibitors	Sitagliptin

6.1.2.3 Other Antidiabetic Drugs

Exenatide M/R 2mg s/c injection NICE TA 248 Exenatide modified-release for the treatment of type 2 diabetes mellitus

Liraglutide 6mg/mL s/c injection – NICE TAG-TA203 Liraglutide for the treatment of type 2 diabetes mellitus

Canagliflozin 100mg tablet – NICE TA315 Canagliflozin for treatment of type 2 diabetes

Canaglifozin
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS81.pdf?UNLID=107184015201672116058

NICE TAG 336 – Empagliflozin in combination therapy for treating type 2 diabetes

Dapagliflozin in combination therapy for treating type 2 diabetes- NICE TA 288 - https://www.nice.org.uk/Guidance/TA288

Dapaglifozin
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS143.pdf?UNLID=107184015201672116516

Dapagliflozin in triple therapy for treating type 2 diabetes
https://www.nice.org.uk/guidance/ta418
APC statement
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS195.pdf?UNLID=307045000201743144520

Empaglifozin
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS125.pdf?UNLID=107184015201672116516

Ertugliflozin as monotherapy or with metformin for treating type 2 diabetes – NICE TA 572
https://www.nice.org.uk/guidance/ta572/resources/ertugliflozin-as-monotherapy-or-with-metformin-for-treating-type-2-diabetes-pdf-82607139445957

Ertugliflozin with metformin and a dipeptidyl peptidase-4 inhibitor for treating type 2 diabetes
https://www.nice.org.uk/guidance/ta583

"Canagliflozin, dapagliflozin and empagliflozin as monotherapies in T2DM" NICE TA 390
https://www.nice.org.uk/guidance/ta418?UNLID=7346948232017461219100

PanMersey hyperlink
http://www.panmerseyapc.nhs.uk/recommendations/documents/PS80.pdf?UNLID=734694823201746121910

For further information on the management of type 2 diabetes please consult NICE guidelines –NICE clinical Guideline 87

Hypoglycaemia
Glucagon

6.2 Thyroid and anti-thyroid drugs

Thyroid hormones
Levothyroxine (thyroxine)
Liothyronine

Antithyroid drugs
Carbimazole
Propylthiouracil

6.3 Corticosteroids

Prednisolone (not enteric coated*)
Dexamethasone
Hydrocortisone
Methylprednisolone

* There is currently no evidence to indicate that enteric coated prednisolone is less likely than uncoated prednisolone to cause peptic ulceration. The evidence that enteric coating is less likely to cause dyspepsia is unsatisfactory and there is no robust evidence to suggest that enteric coating of prednisolone confers gastrointestinal protection. There is however, evidence to suggest lack of disease control for some conditions in those taking enteric coated compared to uncoated prednisolone particularly in cystic fibrosis. Patients should not be commenced enteric coated prednisolone and those currently taking enteric coated should be advised to switch to ordinary tablet. The Pan Mersey Medicines Management committee does not support the use of enteric coated prednisolone in primary care.

6.5 Pituitary hormones

Tetracosactide
Vasopressin
Terlipressin

6.6 Drugs affecting bone metabolism

Disodium etidronate
Disodium pamidronate

7. URINARY TRACT DISORDERS

7.2 Vaginal anti-infective drugs

Clotrimazole 500mg pessary

7.4 Genito-urinary disorders

Urinary retention
Indoramin
Tamsulosin

Urinary frequency
Oxybutynin

Urological pain
Potassium citrate mixture

8. MALIGNANT DISEASE AND IMMUNOSUPPRESSION

8.1 Cytotoxic drugs

Bleomycin

8.2 Immunosuppresants

Azathioprine
Ciclosporin (Neoral)

8.3 Sex hormones and hormone antagonists

Progestogens
Medroxyprogesterone acetate
Megestrol acetate

Hormone antagonists
Tamoxifen
Octreotide

9. 9. NUTRITION AND BLOOD

9.1 Anaemias

Drug	Formulation	Strength	Usual treatment dose
Ferrous Sulphate	Tablets	200mg 65mg elemental iron	200mg BD-TDS
Ferrous Fumarate	Oral solution	140mg/5ml 45mg elemental iron/5ml	280mg BD
Folic Acid	Tablet	5mg	5mg OD
Hydroxocobalamin	IM injection	1mg	1mg three times a week for 2 weeks then 1mg every 2-3 months
Ferric Carboxymaltose (Ferrinject)	Solution for injection/infusion	50mg/ml	Refer to 'Iron Administration in Heart Failure Policy'
Iron Isomaltoside 1000 (Monofer)	Solution for injection/infusion	500mg/5ml	Refer to 'Monofer Pre-Operative Protocol'
Erythropoetin Beta (Neo-Recormon®) (consultant only)			

9.2 Fluids and electrolytes

Oral potassium – refer to Potassium Management Protocol

Drug	Formulation	Strength	Usual treatment dose
Potassium Chloride	Effervescent tablets (Sando K) Sugar free syrup (Kay-Cee-L)	12mmol/tablet 1mmol/ml	2 TDS for 3 days 10-25ml TDS

Potassium removal – refer also to Potassium Management Protocol

Drug	Formulation	Strength	Usual treatment dose
Calcium Resonium	Powder Enema Kit		Orally: 15g QDS Rectally: 30g BD
Sodium Zirconium Cyclosilicate	Powder for oral suspension	5g, 10g	Initially 10g TDS then maintenance if required
Patiromer	Powder for oral suspension	8.4g, 16.8g and 25.2g	Initially 8.4g daily then maintenance 8.4g-16.8g daily

Prescribers should note the contents of NICE TA599 Sodium zirconium cyclosilicate for treating hyperkalaemia

Prescribers should note the contents of NICE TA623 Patiromer for treating hyperkalaemia

Oral sodium

Drug	Formulation	Strength	Usual treatment dose
Sodium Chloride (Slow Sodium)	Modified release tablet	600mg (10mmol each of $Na^+$and Cl^-)	4-8 tablets per day

Oral bicarbonate

Drug	Formulation	Strength	Usual treatment dose

Sodium Bicarbonate	Capsules	500mg (6mmol each of Na^+ and HCO_3^-)	500mg tds

Intravenous fluids and electrolytes

Contact Pharmacy for availability of various solutions

Plasma substitutes

Plasma-Lyte 148 in Water
Geloplasma Infusion

Cardioplegia

Custodiol Cardioplegia
Cardioplegia solution (20ml)
Cardioplegia Infusion 500ml and 1000ml
For intra-operative use during cardiac surgery

Contact Perfusionists for further information

9.3 Intravenous nutrition

Contact Pharmacy or dietician for advice

9.4 Enteral nutrition

Nutritional Supplements

Supplement	Bottle size	Calories	Flavours available
Ensure Compact	125ml	2.4kcal/ml	Banana, Strawberry, Vanilla
Ensure Plus Juce	220mls	1.5kcals/ml	Fruit Punch, Lemon & Lime, Orange
Ensure Plus (milkshake style)	200mls	1.5kcals/ml	Chocolate, Vanilla, Strawberry

NB: Some flavours and feeds may need to be ordered into the trust and may not be available for 24 hours

Nutritional Supplements – On dietician advice only

Supplement	Bottle size	Calories	Flavours available
Fortisip Compact (Cystic Fibrosis Patients)	125mls	2.4kcal/ml	Strawberry
Fortisip Compact Protein	125mls	2.4kcals/ml	Banana, Berry, Mocha, Strawberry

Ensure TwoCal	200mls	2kcals/ml	Vanilla
Ensure Plus Fibre	200mls	1.5kcal/ml	Not stocked routinely
Scandishake	Powder supplement		Banana, Chocolate, Vanilla, Strawberry
Calshake	Powder supplement		Chocolate, Vanilla, Strawberry

NB: Some flavours and feeds may need to be ordered into the trust and may not be available for 24 hours

Modular Supplements - On dietician advice only

Supplement	Bottle size	Description
Pro-Cal Shot	125mls	3.4kcals/ml - Strawberry
ProSource Plus	30mls sachet	15g protein supplement
ProSource Jelly	118mls	20g protein per serving
Calogen	200mls	4.5kcal/ml

Dysphagia Supplements - On dietician advice only

Supplement	Bottle size	Description	Flavours available
Nutilis Complete Drink (Level 3)	125mls	2.4kcal/ml	Strawberry, Vanilla
Nutilis Clear	175g	Thickening powder	
Nutilis Fruit (Level 4)	150g pot	1.37kcal/g	Apple, Strawberry

NB: Some flavours and feeds may need to be ordered into the trust and may not be available for 24 hours

Enteral feeds

All Jevity feeds contain fibre, Osmolite feeds are fibre free

Feed name	Bottle size	Description
Jevity	500mls 1000mls	1kcal/ml 4g protein per 100mls
Jevity Plus	500mls 1000mls	1.2 kcal/ml 5.5g protein per 100mls
Jevity Plus HP	500mls	1.3kcal/ml 8g protein per 100mls
Jevity 1.5kcal	500mls 1000mls	1.5kcal/ml 6.38g protein per 100mls
Osmolite	500mls	1kcal/ml

	1000mls	4g protein per 100mls
Osmolite Plus	500mls 1000mls	1.2 kcal/ml 5.5g protein per 100mls
Osmolite 1.5	500mls 1000mls	1.5kcal/ml 6.38g protein per 100mls
TwoCal	1000mls	2kcals/ml 8.4g protein per 100mls
Vital 1.5	1000mls	1.5kcal/ml 6.75g protein per 100 mls Semi-elemental
Nepro HP	500mls	1.8kcal/ml 8.1g protein per 100mls Electrolyte restricted
Nutrison Low Na	500ml 1000ml	1kcal/ml and 4g protein per 100mls
Peptamen – on dietician advice only	500ml 1000ml	1kcal/ml and 4g protein per 100mls. Semi-elemental formula
Peptamen AF – on dietician advice only	500ml	1.5kcal/ml and 9.4g protein per 100mls. Semi elemental formula
Perative – on dietician advice only	1000ml	1.3kcal/ml and 6.7g protein per 100mls Semi elemental formula

9.5 Minerals

Calcium

Drug	Formulation	Strength	Usual treatment dose
Calcium carbonate	Adcal chewable tablet Cacit effervescent tablets	1500mg (equivalent to 600mg calcium) 1250mg (equivalent to 500mg calcium)	1-2 daily 1-2 daily
Calcium gluconate	Injection	10% (2.25mmol calcium in 10ml)	See Injectable Medicines Guide
Calcium chloride	Injection Infusion	5mmol in 5ml (14.7%) 100mmol/L (1500ml)	See Injectable Medicines Guide

Magnesium

Drug	Formulation	Strength	Usual treatment dose
Magnesium aspartate (Magnasparate)	Powder sachet	243mg (10mmol/sachet)	1-2 sachets daily
Magnesium sulphate	Injection	50% (1g/2ml injection) 2ml, 5ml, 10ml	See Injectable Medicines Guide

Phosphate

Drug	Formulation	Strength	Usual treatment dose
Phosphate-Sandoz®	Effervescent tablets	1.936g (16.1mmol phosphate, 20.4mmol sodium, 3.1mmol potassium)	2 TDS
Potassium dihydrogen phosphate and disodium hydrogen phosphate anhydrous	Polyfusor	Na^+ 162 mmol/litre, K^+ 19 mmol/litre, PO_4^{3-} 100 mmol/litre	See Injectable Medicines Guide

Zinc

Drug	Formulation	Strength	Usual treatment dose
Zinc sulphate (Solvazinc)	Effervescent tablets	125mg (45mg zinc)	125mg OD-TDS

9.6 Vitamins

Vitamin B

Drug	Formulation	Strength	Usual treatment dose
Thiamine (B1)	Tablets	50mg, 100mg	Alcohol withdrawal - 100mg TDS - refer to acute alcohol withdrawal policy Deficiency - 25-300mg daily
Pyridoxine (Isoniazid neuropathy prophylaxis only)	Tablets	10mg, 50mg	10-20mg OD
Vitamin B and C (Pabrinex®)	Injection		2 pairs TDS for 3-5 days – refer to Acute Alcohol Withdrawal Policy 2 pairs OD for refeeding syndrome
Vitamin B Co Strong	Tablets		2 TDS for 10 days for refeeding syndrome

Vitamin C

Drug	Formulation	Strength	Usual treatment dose
Ascorbic acid	Tablets	50mg,200mg,500mg	**For use in scurvy only** Prevention 25-75mg daily Treatment >250mg daily in divided doses

Vitamin D

Drug	Formulation	Strength	Usual treatment dose
Calcium carbonate and vitamin D (colecalciferol)	Adcal D3 Chewable	Calcium carbonate 1500mg (equivalent to 600mg calcium), colecalciferol 400units	1-2 daily
	Adcal D3 Caplets	Calcium carbonate 750mg (equivalent to 300mg calcium), colecalciferol 200units	1-2 daily
	Adcal D3 Effervescent tablets	Calcium carbonate 1500mg (equivalent to 600mg calcium), colecalciferol 400units	1-2 daily
Colecalciferol	Capsules	800units 20 000units 50 000units	See Pan Mersey guidance: Treatment of Vitamin D Deficiency in Adults
	Oral solution	25 000units/ml	
Alfacalcidol	Capsules	250nanograms 500nanograms 1microgram	250nanogram - 5microgram OD
	Sugar free drops	2micrograms/ml	250 nanogram - 5microgram OD
Calcitriol	Capsules	250nanograms 500nanograms	250nanogram - 5microgram OD

Vitamin E

Drug	Formulation	Strength	Usual treatment dose
Vitamin E	Capsules	400units	400 units OD

Vitamin K

Drug	Formulation	Strength	Usual treatment dose
Menadiol	Tablets	10mg	10mg OD (water soluble for use in fat malabsorption states)
Phytomenadione	Tablets (Unlicensed)	10mg	10mg OD

Multivitamin preparations

Drug	Formulation	Strength	Usual treatment dose
Multivitamins	Tablets Drops (Dalavit)	Variable Variable	1 OM Cystic fibrosis – 3 OD 0.6ml OD (14 drops) Cystic Fibrosis – 1ml OD
Paravit CF (Cystic fibrosis only)	Capsules Solution	2 capsules or 0.5ml contains a total of 10,000 units of vitamin A, 3,000units of vitamin D3, 300 units of vitamin E and 10mg vitamin K1	2 OD 0.5ml OD
Vitamin A&D (Cystic Fibrosis only)	Capsules	1 capsule contains 4500units of vitamin A, 450units of vitamin D3	1-3 OD
Forceval	Capsules Soluble capsules	Multivitamin and mineral capsule	1 OD

Refeeding Guidelines:

Method of Feeding	Drug	Dose	Duration	Comments
Fed via feeding tube	Forceval solube	1 OD	10 days	Fully dissolved
	Thiamine	100mg TDS	10 days	Fully dispersed in 10ml water
Orally fed	Forceval capsule	1 OD	10 days	
	Thaimine	100mg TDS	10 days	
	Vitamin B Co Strong	2 TDS	10 days	Not to be crushed
Parenteral Nutrition	Pabrinex	1 pair OD	3 days	Forceval is not needed

10. MUSCULOSKELETAL AND JOINT DISEASES

10.1 Drugs used in rheumatic diseases and gout

Non-steroidal anti-inflammatory drugs
Ibuprofen
Diclofenac (PR only)

NICE guidance (cyclo-oxygenase-2 selective inhibitors). NICE has recommended that cyclo-oxygenase-2 selective inhibitors (celecoxib, etodolac and meloxicam) should:
• **not** be used routinely in the management of patients with rheumatoid arthritis or osteoarthritis;
• be used in preference to standard NSAIDs **only** when clearly indicated (and

in accordance with UK licensing), for patients with a history of gastroduodenal ulcer or perforation or gastro-intestinal bleeding—in these patients even the use of cyclo-oxygenase-2 selective inhibitors should be considered very carefully; they should also be used in preference to standard NSAIDs for other patients at **high risk** of developing serious gastro-intestinal side-effects (e.g. those aged over 65 years, those who are taking other medicines which increase the risk of gastro-intestinal effects, those who are debilitated or those receiving long-term treatment with maximal doses of standard NSAIDs);
• **not** be used routinely in preference to standard NSAIDs for patients with cardiovascular disease; the benefit of cyclo-oxygenase-2 selective inhibitors is

reduced in patients taking concomitant low-dose aspirin and this combination is **not justified**.

There is no evidence to justify the simultaneous use of gastro-protective drugs with cyclo-oxygenase-2 selective inhibitors as a means of further reducing potential gastro-intestinal side-effects.

Local corticosteroid injections
Methylprednisolone

Drugs used in gout
Colchicine (acute attacks if need to avoid fluid retention)
Allopurinol (long term control)

10.2 Neuromuscular disorders

Drugs which enhance neuromuscular transmission
Pyridostigmine
Edrophonium

Skeletal muscle relaxants
Dantrolene
Baclofen
Diazepam

Nocturnal leg cramps
Quinine sulphate 300mg tablets

10.3 Topical antirheumatics

Benzydamine

11. DRUGS ACTING ON THE EYE

11.3 Anti-infective preparations

Antibacterials
Chloramphenicol (drops and ointment)

Antivirals
Aciclovir ointment

11.4 Corticosteroids

Betamethasone drops
Prednisolone drops

11.5 Mydriatics

Tropicamide drops

11.6 Treatment of glaucoma

Contact Pharmacy for availability of specific treatments

11.8 Miscellaneous

Tear deficiency
Hypromellose drops

12. EAR, NOSE AND OROPHARYNX

12.1 Drugs acting on the ear

Anti-inflammatory and anti-infective preparations
Betamethasone drops
Gentamicin drops

Removal of ear wax
Sodium bicarbonate drops

12.2 Drugs acting on the nose

Nasal allergy
Beclometasone nasal spray (Beconase®)
Fluticasone nasal spray (Flixonase®)

Nasal staphylococci
Mupirocin
Naseptin®

12.3 Drugs acting on the oropharynx

Ulceration and inflammation

Benzydamine mouthwash/spray (Difflam®)
Triamcinolone (Adcortyl) in Orabase
Choline salicylate gel (Bonjela®)

Fungal infections
Nystatin

Oral hygiene
Thymol (mouthwash tablets)
Chlorhexidine gluconate

Dry mouth
Glandosane® spray (Restricted use. Severe cases only)

13. SKIN

See NPSA alert regarding fire hazard with products containing 100g or more of paraffin
http://www.nrls.npsa.nhs.uk/resources/?entryid45=59876

Emollients
White soft paraffin
Hydromol ointment
Oilatum bath additive

Moisturisers
E45 cream
Diprobase

Barrier preparations
Metanium ointment
Cavilon barrier cream and film spray

Topical antipruritics
Crotamiton cream (Eurax)

Topical corticosteroids
Hydrocortisone 1%
Fucibet cream
Fucidin H cream

Sunscreens

Uvistat factor 30

Anti-infective skin preparations

Antibacterials

Mupirocin
Silver sulfadiazine
Metronidazole gel

Antifungals
Clotrimazole

Antivirals
Aciclovir

Scabies and lice
Malathion

Disinfectants and cleansers

Chlorhexidine
Povidone iodine
Alcoholic iodine solution
Hydrogen peroxide

A8 WOUND MANAGEMENT

See wound care formulary and guidelines

14. IMMUNOLOGICAL PRODUCTS AND VACCINES

Tuberculin PPD (100units/ml)
Hepatitis B vaccine
Influenza vaccine
Pneumococcal vaccine
Tetanus Vaccine Adsorbed
Tetanus immunoglobulin
Normal immunoglobulin for IV use

15. ANAESTHESIA

15.1.1 Intravenous anaesthesia

Thiopental
Etomidate
Propofol
Ketamine

15.1.2 Inhalational anaesthesia

Enflurane
Sevoflurane
Isoflurane

15.1.3 Antimuscarinics

Atropine
Glycopyrronium
Hyoscine hydrobromide

15.1.4 Sedative and analgesic peri-operative drugs

Anxiolytics and neuroleptics
Diazepam
Lorazepam
Midazolam

Non-opioid analgesics
Ketorolac
Dexmedetomidine (use only for post operative sedation/analgesia supplementation for patients after thoracoabdominal aortic aneurysm surgery)

Opioid analgesics
Alfentanil
Fentanyl
Remifentanil

15.1.5 Muscle relaxants

Atracurium
Mivacurium
Pancuronium
Rocuronium
Suxamethonium
Vecuronium

15.1.6 Anticholinesterases

Neostigmine
Edrophonium

15.1.6.1 Other drugs for reversal of neuromuscular blockade

Sugammadex

15.1.7 Antagonists for central and respiratory depression

Doxapram
Flumazanil
Naloxone

15.1.8 Malignant hyperthermia

Dantrolene

15.2 Local anaesthetics

Lidocaine (lignocaine)
Bupivacaine
Cocaine
Emla cream