Chapter 4: Central nervous system

The GHT Formulary applies to the treatment of adults only

To search the chapter click 'Ctrl' + 'F' and type the drug name

Neurology Department

Management of status epilepticus [local policy]
IV phenytoin administration [local policy]

Rapid Tranquilization [local policy]
Management of opiate users [local policy]
Pain management in morphine allergy [local policy]

Alcohol Detoxification [local policy]
Smoking Cessation [local policy]

4.1 Hypnotics and anxiolytics

- Anxiety and insomnia should be tolerated if possible. Medication should be reserved for severe and disabling cases.
- Benzodiazepines are indicated for the short-term relief of anxiety (2 to 4 weeks) to alleviate acute conditions. Tolerance and dependence can occur after only a few weeks.
- Benzodiazepines should be avoided where there is a history of substance misuse including alcohol.
- To reduce the risk of tolerance and dependence benzodiazepines should be prescribed as required.
- Patients who have not previously received a hypnotic should not receive one on discharge.
- Refer to BNF (section 4.1) for information on benzodiazepine withdrawal [click here].

4.1.1 Hypnotics

- Before a hypnotic is prescribed the underlying cause should be identified and addressed, and realistic sleep requirements should be discussed with the patient.
- All hypnotics should be used for the minimum length of time due to the risks of dependence.

Recommended: Zopiclone [NICE technology appraisal]
Alternative: Temazepam
4.1.2 Anxiolytics

Recommended: **Diazepam**
- Benzodiazepines should be prescribed at the lowest possible dose for the shortest possible time due to the risk of dependence.
- Diazepam should be used with caution in the elderly. Lorazepam is preferred in these patients.

Alternative: **Lorazepam**

Specific indication:
- **Midazolam** – for procedures
  - Use with caution: NPSA Rapid Response Report
- **Oxazepam** – liver impairment
- **Propranolol** – see chapter 2.4 (Anxiety with Palpitations, Sweating, Tremors)

- Some antidepressants are licensed for anxiety - see section 4.3
- Management of anxiety: NICE Guidelines

4.1.3 Barbiturates

None

4.2 Drugs used in psychoses and related disorders

4.2.1 Antipsychotic drugs

- In the acute treatment of psychosis benzodiazepines may be required.
- Rapid tranquillisation: Local policy
- Schizophrenia - NICE guidelines

Recommended: **Risperidone**
- Note: Risperidone is available "off-patent" and is therefore currently the least expensive 'atypical antipsychotic'.

- **Olanzapine**
- **Quetiapine**
- **Aripiprazole**

Alternative:
- **Haloperidol**
- **Amisulpride**
- **Sulpiride**
- **Zuclopenthixol**
- **Perphenazine**
- **Trifluoperazine**
- **Chlorpromazine**

- The oral atypical antipsychotics should be considered in preference to the typical antipsychotics in the elderly with a psychosis. For dementia see section 4.11.
Antipsychotics should be used with caution in the elderly as parkinsonian symptoms may occur.

Specific indication: Clozapine – schizophrenia on the advice of psychiatry

- Clozapine is restricted to patients who have not responded to two or more antipsychotics (one of which should be an atypical antipsychotic), or who are intolerant of conventional antipsychotics.
- In the case of psychotic disorders occurring during the course of Parkinson's disease, quetiapine, sulpiride or olanzapine are preferable, but clozapine can be used when standard treatment has failed.
- Clozapine may only be initiated by senior medical staff working in psychiatry, or neurology, who are registered with Clozaril Patient Monitoring Service (CPMS). The patient and supplying Pharmacist must also be registered with the CPMS.
- Full blood counts are required prior to and during clozapine treatment.

4.2.2 Antipsychotic long acting injections

Recommended:
- Flupentixol decanoate
- Fluphenazine decanoate
- Haloperidol decanoate
- Zuclopenthixol decanoate
- Pipotiazine palmitate
- Risperidone

- These preparations may only be initiated on the advice of senior medical staff working in psychiatry.
- Please refer to BNF section 4.2.1 for advice on equivalent doses of antipsychotic drugs (click here).

4.2.3 Antimanic drugs

- Acute treatment may also require a benzodiazepine and an antipsychotic.

Recommended:
- Lithium carbonate MR (Priadel®)
- Lithium citrate liquid (Li-Liquid®/ Priadel®)

- Lithium has a narrow therapeutic / toxic ratio and should therefore not be prescribed unless facilities for monitoring serum-lithium concentrations are available. Samples should be taken 12 hours after the preceding dose: sample requirements
- Lithium Monitoring Criteria:
  - Patient prescribed lithium must be monitored in accordance with NICE guidance:
    - Lithium levels must be measured every 3 months
    - Renal function must be monitored every 6 months
    - Thyroid function must be monitored every 6 months
- Lithium Record Booklet (click here)

Alternative: Risperidone

Note: Risperidone is available "off-patent" and is therefore currently the least expensive
4.3 Antidepressant drugs

- Antidepressants have markedly different safety profiles in overdose. Where there are concerns regarding suicide risk the SSRIs are the least toxic in overdose. Of the tricyclic antidepressants, lofepramine is the least toxic.
- Antidepressants should not be withdrawn abruptly if the patient has been taken them regularly for 8 weeks or more, unless there is a serious adverse drug reaction.
- Care should be taken when switching between antidepressants. Contact Medicines information for advice: GRH ext. 6108, CGH ext 3030
- SSRIs should not be prescribed in children and adolescents unless under the advice of a Child & Adolescent Mental Health Consultant.
- Management of depression: NICE guidelines

4.3.1 Tricyclic and related antidepressant drugs

- In general, SSRIs are the first-line choice for the treatment of depression.
- Tricyclics should not be used in those over 75 years of age.

Recommended: Lofepramine
Alternative: Amitriptyline
Imipramine
Clomipramine
Dosulepin - particularly toxic in overdose. MHRA Guidance

4.3.2 Monoamine-oxidase inhibitors

- In general, SSRIs are the first-line choice for the treatment of depression.
- Diet Restrictions with MAOIs: Advice Sheet

Specific indication:
Moclobemide – Specialist use only
Isocarboxazid – Specialist use only
Phenelzine – Specialist use only

4.3.3 Selective serotonin re-uptake inhibitors (SSRIs)

Recommended: Citalopram
Where there is mixed depression and anxiety, citalopram may be considered first line.

SSRIs may initially increase anxiety levels and it may be necessary to ‘cover’ their initiation with a brief course of a benzodiazepine in order to encourage compliance.

Abrupt withdrawal of SSRIs should be avoided (associated with headache, nausea, paraesthesia, dizziness and anxiety).

Withdrawal syndrome is reported to the CSM more commonly with paroxetine than with other SSRIs.

4.3.4 Other antidepressant drugs

Recommended:  
Venlafaxine  
Mirtazapine  
Reboxetine

Venlafaxine may be considered if a patient fails on another antidepressant or in severe depression.

BP monitoring is advisable for doses of venlafaxine above 200mg daily.

Use of mirtazapine and reboxetine is reserved for those patients that have found a SSRI or TCA ineffective following an adequate trial, or where a SSRI or TCA is contraindicated or poorly tolerated. Mirtazapine may be useful for treating depression in patients with reduced appetite.

4.4 Central nervous system stimulants and other drugs used for attention deficit hyperactivity disorder

Specific indication:  
Methylphenidate – only to be initiated by a specialist experienced in managing ADHD.

Atomoxetine – only to be initiated by a specialist experienced in managing ADHD.

Attention Deficit Hyperactivity Disorder – NICE technology appraisal

Dexamfetamine – refer to BNF for indications.

Modafinil – narcolepsy

4.5 Drugs used in the treatment of obesity

These drugs should be initiated in primary care. Treatment will be continued in secondary care if a patient is admitted while being treated with these drugs.

4.6 Drugs used in nausea and vertigo
• Also refer to Palliative care chapter (click here)
• Both metoclopramide and prochlorperazine may precipitate extrapyramidal effects especially in the young and the elderly. Domperidone is less likely to cause such a reaction.
• Rectal or parenteral administration of antiemetics will be required if vomiting has already started.
• Domperidone is the antiemetic of choice in patients with Parkinson’s disease
• Metoclopramide increases gut motility whereas ondansetron reduces gut motility – particularly important following gastrointestinal surgery.

General and post-operative nausea and vomiting (PONV)

Recommended: Cyclizine
Metoclopramide

Alternative: Prochlorperazine
Domperidone

Specific indication: Ondansetron – see below

• The use of Ondansetron should be reserved for:
  a) In the prevention of PONV, patients classified as high risk.
  b) In the treatment of PONV, patients requiring rescue medicine.
  c) In general patients, those with protracted nausea and vomiting who have failed to respond to two conventional anti-emetics at full dose. If the symptoms are extremely severe, Ondansetron may be prescribed after trying only one conventional anti-emetic.

Cytotoxic chemotherapy

• Please refer to OPMAS electronic prescribing system
• 3 County Cancer Network anti-emetics policy click here

Recommended: Cyclizine
Dexamethasone
Domperidone
Haloperidol
Levomepromazine
Metoclopramide
Ondansetron
Prochlorperazine

Alternative: Granisetron
Nabilone

Radiotherapy induced vomiting

Recommended: Ondansetron
Vestibular disorders

Recommended:  
- Betahistine
- Cinnarizine
- Prochlorperazine
- Hyoscine hydrobromide patch

For treatment of nausea and vomiting associated with vestibular disorder and to reduce secretions in neurological conditions.

Migraine

Recommended:  
- Domperidone
- Metoclopramide

4.7 Analgesics

- For NSAIDs see 10.1.1
- Also refer to Palliative care chapter (click here)

4.7.1 Non-opioid analgesics

Recommended:  
- Paracetamol

Paracetamol has no demonstrable anti-inflammatory effect. If the pain has an inflammatory component then an NSAID should be considered.

Alternative:  
- Co-codamol 30/500
- Co-codamol 8/500

- Where possible paracetamol and codeine should be prescribed individually and the dose titrated according to pain. Co-codamol may be prescribed in palliative care to reduce tablet burden.
- Effervescent analgesics are not generally recommended because they are expensive and contain large amounts of sodium. Use is restricted to patients unable to swallow tablets or in the treatment of migraine attacks (see section 4.7.4.1).
- Low dose weak opioid combinations with paracetamol (e.g. co-proxamol, co-codamol 8/500) offer little additional pain relief compared with regular full dose paracetamol.
4.7.2 Opioid analgesics

- In general, the use of more than one opioid should be avoided.
- Contact Medicines Information for advice on dose equivalence when switching between opioids. GRH ext. 6108, CGH ext. 3030
- Caution - Opioids accumulate in renal impairment resulting in increased and prolonged effect.
- Regular paracetamol (1g qds) may have an 'opioid-sparing' effect, thus enabling a lower opioid dose.

**Weak opioids**

**Recommended:** Codeine

**Alternative:** Dihydrocodeine – efficacy does not increase above a certain dose; however, the risks of side effects and dependence do; do not prescribe more than 30mg of dihydrocodeine as a single dose.

**Specific indication:** Tramadol – Patients with a definite intolerance to codeine. CGH Tramadol Poster

**Strong opioids**

- Policy for pain management in patients with morphine allergy

**Recommended:** Morphine – parenteral

- oral, immediate release: Oramorph® liquid
- oral, modified release: Zomorph® capsules

**Diamorphine** – parenteral

**Alternative:** Oxycodone – parenteral

- oral, immediate release: Oxynorm® liquid
- oral, modified release: Oxycontin® tablets

**Specific indication:** Fentanyl – patches, pain team / palliative care.

- lozenges, pain team / palliative care.

**Hydromorphone** – pain team / palliative care.

**Methadone** – parenteral, pain team / palliative care.

- oral, substance misuse team

**Buprenorphine** – patches, pain team / palliative care (useful in renal impairment)

- oral, pain team / palliative care / substance misuse team

**Pethidine** – pain team / palliative care / obstetrics (unsuitable for chronic pain due to short duration of action. The toxic metabolite nor-pethidine accumulates with repeated use and in renal impairment.)
4.7.3 Neuropathic and functional pain

Recommended: Amitriptyline (unlicensed use)
Gabapentin – see section 4.8.1

Alternative: Carbamazepine
Sodium valproate (unlicensed use)
Imipramine (unlicensed use)
Nortriptyline (unlicensed use)

Specific indication: Corticosteroids – compression neuropathy
Capsaicin (Axsain® cream) – diabetic neuropathy
Ketamine – palliative care only
Clonazepam – palliative care only
Pregabalin – specialist initiation only

4.7.4 Antimigraine drugs

4.7.4.1 Treatment of the acute migraine attack

- Simple analgesia (e.g. paracetamol, NSAIDs) is often effective.
- Dispersible or effervescent preparations are preferred because peristalsis is often reduced during migraine attacks.
- Formulations such as suppositories may allow absorption
- Concomitant anti-emetics may be required e.g. metoclopramide or domperidone tablets/suppositories (see 4.6)

5HT1 agonists if simple analgesia fails:

Recommended: Sumatriptan
Alternative: Rizatriptan wafers (Maxalt® Melt)
Zolmitriptan

- If one 5HT1 agonist is ineffective patients may respond to another.
- 5HT1 agonists should not be used for prophylaxis and they are contraindicated in ischaemic heart disease, previous MI, coronary vasospasm (including Prinzmetal’s angina), and uncontrolled hypertension.
- Use of 5HT1 agonists with ergotamine/ergotamine-derivatives should be avoided. Refer to BNF for guidance on switching from 5HT1 agonists and ergotamine and vice versa (click here).

Specific Indication: Migril® – Specialist use only
Sumatriptan injection – specialist use only

4.7.4.2 Prophylaxis of migraine

Recommended: Amitriptyline (unlicensed use)
Gabapentin – see section 4.8.1

Alternative: Carbamazepine
Sodium valproate (unlicensed use)
Imipramine (unlicensed use)
Nortriptyline (unlicensed use)

Specific indication: Corticosteroids – compression neuropathy
Capsaicin (Axsain® cream) – diabetic neuropathy
Ketamine – palliative care only
Clonazepam – palliative care only
Pregabalin – specialist initiation only
• Acute treatments are still required. Prophylaxis only reduces the severity and frequency of attacks. Please note however that 5HT₁ agonists must not be taken within 24hrs of methysergide.

Recommended: Propranolol
Alternative: Amitriptyline (unlicensed use)
Pizotifen
Sodium valproate (unlicensed use)
Topiramte
Methysergide – Consultant Neurologist only

### 4.7.4.3 Cluster headache

Recommended:
Acute: Sumatriptan (sub-cutaneous injection)
Oxygen
Prophylaxis: Verapamil (Unlicensed)
Sodium valproate (Unlicensed)

### 4.8 Antiepileptics

#### 4.8.1 Control of epilepsy

• The choice of antiepileptic agent will depend on the type of epilepsy
• Newer antiepileptic drugs – NICE technology appraisal

Recommended: Sodium valproate – use with caution in women of child bearing potential.
Carbamazepine – Therapeutic Drug Monitoring
Lamotrigine
Phenytoin – see information below
Clobazam
Clonazepam
Gabapentin
Acetazolamide*
Ethosuximide*
Lacosamide*
Levetiracetam*
Oxcarbazepine*
Phenobarbital*
Pregabalin*
4.8.2 Drugs used in status epilepticus

- Management of status epilepticus – Local Policy

Recommended:
- Primidone*
- Tiagabine*
- Topiramate*
- Zonisamide*

*These agents are indicated when symptoms have not been controlled with other antiepileptics. They may only be prescribed on the recommendation of a Specialist.

- Bioavailability may vary between different oral phenytoin preparations. For patients already stabilised on phenytoin, it is important to determine whether the patient takes tablets or capsules and to specify this on the prescription. **When oral phenytoin is newly initiated, capsules should be prescribed** (significantly cheaper than tablets). Contact pharmacy for advice on switching between phenytoin tablets/capsules and liquid.
- Patients admitted on phenobarbitone and primidone should be maintained on treatment, unless on Specialist advice, as withdrawal seizures may occur.

Specific indication: **Vigabatrin** – initiated & supervised by a Specialist

4.8.3 Febrile convulsions

Recommended:
- Lorazepam – parenteral
- Diazepam – rectal tubes
- Phenytoin – slow i.v. injection
- Midazolam – buccal, out-patient use (in conjunction with an individual patient plan - unlicenced)

Alternative: **Phenobarbitone**

- Midazolam injection – Use with caution:
  - NPSA Rapid Response Report

Specific indication:
- Paraldehyde – Specialist use
- Sodium thiopentone – Specialist use
- Thiamine (Pabrinex® IV/IM) – alcohol abuse local guidelines
- Pyridoxine – deficiency

4.8.4 IV Phenytoin Administration in Adults – Local Policy

Alternative:
- Phenobarbitone
- Midazolam injection

Specific indication: **Paraldehyde** – Specialist use

4.8.3 Febrile convulsions
4.9 Drugs used in parkinsonism and related disorders

- The symptoms of drug-induced parkinsonism, e.g. with antipsychotic drugs, may be suppressed with the antimuscarinic drugs. However, routine administration is not justified.
- Management of Parkinson's Disease – NICE guidelines

4.9.1 Dopaminergic drugs used in parkinsonism

- Gloucestershire Hospitals NHS Trust is currently taking part in the PD MED trial which aims to determine which class of drugs provides the most effective control, with the fewest side-effects, for both early and later Parkinson’s Disease - seek the advice of a Specialist

Recommended:
- Co-beneldopa (Madopar®)
- Co-careldopa (Sinemet®)
- Co-careldopa with entacapone (Stalevo®)
- Selegiline
- Entacapone
- Amantadine
- Rotigotine patch
- Ropinirole
- Pramipexole
- *Cabergoline
- *Pergolide
- *Bromocriptine – established patients only
- Apomorphine

Note: *ergot-derived dopamine agonists (e.g. cabergoline, pergolide, bromocriptine) have been associated with fibrotic reactions CSM statement

4.9.2 Antimuscarinic drugs used in parkinsonism

Specific indication:
- Benztropine
- Orphenadrine
- Procyclidine
- Trihexyphenidyl

- Antimuscarinics can be of help with tremor, but use is limited by side effects of confusion, prostatism, dry eyes, and dry mouth especially in the elderly.

4.9.3 Drugs used in essential tremor, chorea, tics, and related disorders

Recommended:
- Paracetamol
- Diazepam rectal – prolonged or recurrent seizures
Torsion dystonias and other involuntary movements

Specific indication:  
- **Propranolol** – essential tremor  
- **Primidone** – essential tremor  
- **Piracetam** – myoclonus  
- **Tetrabenazine** – Huntingdon’s chorea  
- **Riluzole** – for use in the management of motor neurone disease within NICE guidance

- Motor neurone disease – riluzole: [NICE technology appraisal](#)

4.10 Drugs used in substance dependence

Alcohol dependence

- Refer to local Alcohol Detoxification Guidelines (click here).
- In alcohol withdrawal Pabrinex® and/or thiamine may be required.
- Facilities for treating anaphylaxis should be available when administering Pabrinex®.

Specific indication:  
- **Chlordiazepoxide** – alcohol withdrawal  
- **Acamprosate** – specialist advice only  
- **Disulfiram** – specialist advice only

Cigarette smoking

- Refer to local Smoking Cessation Guidelines (click here).
- Contact Gloucestershire Smoking Advice Service (GSAS) for advice or referrals  
  - 08454 220040  
- Smoking Cessation – [NICE guidelines](#)

Specific indication:  
- **Nicotine replacement therapy**

Opioid dependence

- Refer to local Guidelines for the Management of Opiate Users on the Ward (click here)
4.11 Drugs for dementia

- Management of dementia - NICE guidelines
- National Prescribing Centre - MeReC Bulletin

Specific indication:

- **Donepezil** – tablets
- **Galantamine** – tablets
- **Rivastigmine** – capsules, patches

Donepezil, galantamine and rivastigmine are recommended as options for the treatment of moderate Alzheimer's disease: NICE technology appraisal

Anxiolytics and tranquillising drugs in elderly patients and patients with dementia

- Anxiety should be tolerated to some extent. Medication is associated with a high frequency of unwanted and sometimes serious side effects. The use of olanzapine and risperidone in patients with dementia has been restricted by the CSM due to links with stroke. (click here for CSM advice)
- Non-pharmacological management should usually be first line.
- Depression and additional pathologies should be specifically sought.
- Alternative atypical antipsychotics in the lowest effective dose should be used if necessary. Time-limited courses, with doses given 1-2 hours before times of peak agitation are better than ‘prn’ prescribing. There is no data to say whether other atypicals will cause similar side-effects to olanzapine and risperidone.
- Sedation, parkinsonism and non-specific decline should be watched for.

Recommended: **Quetiapine** – Unlicensed. Start at 25mg and adjust to response.

Specific indication:

- **Sodium valproate** – for irritability in dementia. Unlicensed. Usual dose 200mg tds.
- **Diazepam** – 2mg bd for very short courses.

- Benzodiazepine use in elderly patients is associated with falls and cognitive impairment.
- Lorazepam and other shorter-acting sedatives may relieve a management problem for a few hours but leave an unchanged or worsened situation subsequently.

Specific Indication:

- **Methadone** – see guidelines above
- **Buprenorphine** – specialist advice only
- **Lofexidine** – specialist advice only
- **Naltrexone** – specialist advice only