



Training & Development

A Basic Guide to Medication for Health Professionals

Training for Registered Nurses, Paramedics, Occupational Therapists and Physiotherapists

(Workbook)

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Changes since last version

Updated PIPAG reference; Updated Foreword; Case studies – some made as Telephone Assessments to reflect their use since last review; questions made 'bold' in case studies; hyperlinks checked and updated where needed; spelling and grammar check.

Outstanding issues and omissions

Updates to Standards incorporated

PIP Assessment Guide Parts 1-3 (updated 24th January 2022)
BNF accessed via <https://bnf.nice.org.uk/drug/>

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Foreword

This module has been produced as part of an Independent Assessment Services (IAS) training programme for Health Professionals (HP's) who will be completing Disability Assessments.

All Health Professionals undertaking PIP assessments must be registered medical practitioners, registered nurses, paramedics, occupational therapists or physiotherapists who, in addition, have undergone training in disability assessment medicine and specific training in PIP Assessment. The training includes distance learning modules, theory training in a classroom setting, supervised practical training, and a demonstration of understanding as assessed by quality audit. The PIP Assessment Guide which forms an integral part of that training has been provided by the Department of Work and Pensions (DWP) and is referred to throughout the training provided by IAS.

There are areas in the training where it is useful to revise diagnostic or assessment principles, and where appropriate, these have been included for the relevant HPs.

In addition, the training module is not a stand-alone document, and forms only a part of the training and written documentation that a health professional receives. The DWP "PIP Assessment Guide" must be read in conjunction with IAS training material, as it provides information on the DWP's scope and intention for each of the twelve PIP Activities and corresponding Descriptors in each activity area. As disability assessment is a practical occupation, much of the guidance also involves verbal information and coaching.

Thus, although the training module may be of interest to non-medical readers, it must be remembered that some of the information may not be readily understood without background medical knowledge and an awareness of the other training given to Health Professionals. Some Health Professionals from these professional groups may find it a useful revision and are welcome to use these resources for reflective practice purposes if they wish.

PIP Clinical Director

July 2022

1. A Basic Guide to Medication - Overview

This document is not intended to give you a comprehensive account of pharmacology - but should serve as a guide to refresh existing knowledge and help you to identify any learning gaps you may have.

In this document you will find some detail on how some groups of medications work, this is for general background knowledge only. You will also find some references to journal articles. It is not essential that you read these at this time, however; you may wish to review these at a later stage as part of ongoing personal learning.

You must ensure that you have access to the current British National Formulary (BNF) <https://bnf.nice.org.uk/drugs/>

You should read each section of this document and then refer to the BNF for further guidance and information.

In, most of the time, we refer to medication by the generic name e.g. salbutamol rather than by any "brand name" - e.g. "Ventolin", however; claimants will often refer to their medication using the brand name, so you should use the BNF to familiarise yourself with some of these.

If you feel you wish to gain further familiarity with pharmacology, there are a number of very useful textbooks that provide more detail on drug action/interactions that you may wish to consider obtaining access to. Many of these are now available in an electronic format such as The BMA Concise Guide to Medicines and Drugs by Dorling Kindersley - but you can choose any formal medical pharmacology book that suits your learning style.

More information can also be obtained from:

NICE - The National Institute for Health and Care Excellence which provides national guidance and advice on the management of many medical conditions – <http://www.nice.org.uk/guidance>

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

2. Musculoskeletal Conditions

2.1 Pain relief

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

2.1.1 Paracetamol

Paracetamol is a commonly used analgesic. It is used in mild to moderate pain and can be used in combination with other forms of pain relief such as codeine and non-steroidal anti-inflammatory drugs (see relevant sections in this document).

It can be used in a wide variety of conditions such as musculoskeletal pain, headaches, dysmenorrhoea etc.

It is generally well tolerated, and side effects are rare but must be used with caution in those with liver impairment.

2.1.2 NSAIDs

Non-Steroidal Anti-inflammatory drugs have both analgesic and anti-inflammatory properties. They work by blocking an enzyme cyclo-oxygenase which is involved in the production of prostaglandins. Prostaglandins have a number of functions in the body including sensitising spinal neurons to pain and probably have a role in causing hyperalgesia. They can be used in soft tissue disorders including back pain, arthritic problems (both osteoarthritis and rheumatological conditions), following trauma e.g. fractures and in a number of other conditions where pain may occur - e.g. headaches, dysmenorrhoea etc.

The BNF indicates that NSAIDs have a similar analgesic level to that of Paracetamol, however due to their longer lasting analgesic effect and additional anti-inflammatory effect; they can be suitable for conditions with chronic and enduring pain.

The most common anti-inflammatory medications we encounter are:

- Ibuprofen, Diclofenac and Naproxen.

All of these drugs have similar efficacy, but some are better tolerated than others. The most common side effects of NSAIDs are Gastro-Intestinal (GI) side effects, including nausea, dyspepsia, diarrhoea and GI tract ulceration.

There are a number of cautions and contraindications to the use of NSAIDs. These include individuals with renal or hepatic impairment, cardiac conditions, elderly people, those with inflammatory bowel disorders or GI ulceration. Some people with asthma cannot tolerate

NSAIDs, but not all asthmatics are intolerant and many people with asthma use NSAIDs without any ill effects.

NSAIDs can be used in conditions where pain and disability range from mild to more severe. You should consider how regularly the person uses the medication in terms of variability of condition, also considering other pain relief used in conjunction with the NSAID. If a person is not using anti-inflammatory medication, you should not assume this is just because their level of pain does not require it, it may be that they have contraindications to this class of drugs or are unable to tolerate the side effects of this type of medication.

2.1.3 Opiate Based Pain Relief

Opiate based drugs vary widely in strength and usage.

Milder opiates such as codeine, may be used in mild to moderate pain, while **stronger opiates such as Morphine and Fentanyl**, are used in severe pain such as in the management of visceral pain, or in chronic pain syndromes. Codeine has approximately one tenth of the potency of morphine i.e. 10mg of morphine would be roughly equivalent to 100mg of codeine. (BNF - Pain Management with opioids)

All Opiates can be associated with a variety of side effects such as nausea and vomiting, anorexia, dry mouth, constipation, dizziness and sedation. More unusual side effects such as paralytic ileus have also been identified. Dependency can become an issue when opiates are used in the long term.

The higher the dose of opiate, the more likely side effects may be, although with time and gradual increase in dose, tolerance to both the analgesic effects and side effects may occur. For example, some people with advanced malignancy may be on very high doses of morphine but tolerate this well. If a person is on a very high dose of opiates, you must consider whether functional impairment is likely, however; you must bear in mind that many people can be on high doses of opiates that control their pain and that they that they tolerate well allowing them to function well.

Codeine is commonly prescribed combined with Paracetamol as Co-codamol. The amount of codeine and Paracetamol will be expressed as Co-codamol **X**(codeine content)/**Y**(Paracetamol content). The most common formulations of Co-codamol you will see are Co-codamol 8/500 and 30/500.

Dihydrocodeine has a similar analgesic strength to codeine but in higher doses can have an increased frequency of nausea and vomiting.

Morphine and Fentanyl are strong opiate preparations. They are usually indicative of severe pain and are not commonly used in the long-term management of musculoskeletal disorders. If a claimant is on morphine for pain relief for musculoskeletal pain, you should consider whether this may suggest a more severe level of disability is likely. Morphine can be administered by a number of routes and has long acting preparations (such as MST) and

shorter acting preparations such as Oramorph. Fentanyl can be used intravenously during surgery or can be used as a transdermal patch lasting 72 hours.

Other opiate based analgesics you will see relatively commonly are Tramadol and Oxycodone. Tramadol has an opioid effect but also works on other chemicals in the brain to produce analgesic effects. It is a moderately strong pain killer but is sometimes better tolerated in its use than traditional morphine. Oxycodone is similar in strength to morphine. It is mainly used in palliative care especially where the side effects of morphine cannot be tolerated.

All opiates have various cautions and contraindications and you should refer to the “Opiate” section of the BNF for further guidance on these issues and normal doses.

2.2 Disease Modifying Drugs used in Inflammatory Arthropathies

For inflammatory arthropathies such as Rheumatoid Arthritis, other classes of drugs may be used to modify the disease process by means of slowing or stopping disease progression with the use of disease modifying anti-rheumatic drugs (DMARDS) or biological therapies.

2.2.1 Disease-modifying anti-rheumatic drugs (DMARDS)

Conventional DMARDS have been proven to re disease progression and have been used for many years in the treatment of rheumatoid arthritis. The onset of action is delayed (2-6 months), necessitating the use of anti-inflammatory medications to control symptoms whilst the DMARDS take effect.

DMARDS require specialist prescribing and those on DMARDS require careful monitoring of their condition as side effects can be common including significant hepatic and renal upset. If you see a person on DMARDS, you should consider the possibility of severe or significant impairment, however; you should also keep in mind that while being on these drugs may suggest a significant diagnosis, they are now prescribed early in the disease process and may be controlling the condition well. If the medication is causing any side effects, these should always be considered when assessing function.

Some of the common DMARDS are listed below but for full details, please refer to the BNF.

Methotrexate

Methotrexate is considered the gold standard treatment in rheumatoid arthritis. It is administered orally once a week or by sub-cutaneous injection which can help to reduce side effects of oral administration should these be a problem. While it is much better tolerated than some other DMARDS (e.g. gold), side effects can include:

- Post digestion nausea (the most common side effect)
- Other gastrointestinal effects: mucosal ulceration, vomiting, oesophagitis, anorexia, diarrhoea, gingivitis, bleeding and perforation, pancreatitis, elevated transaminases and cirrhosis
- Alopecia

- Bone marrow suppression (anaemia, leucopenia, thrombocytopenia, aplastic anaemia, lymphoproliferative disorders)
- Infections
- Interstitial pneumonitis
- Renal impairment
- Nervous system (headaches, dizziness, drowsiness, blurred vision, neurotoxicity)

Gold (given as Sodium Aurothiomalate)

Gold is the oldest DMARD and rarely if ever now used in the treatment of individuals newly diagnosed with rheumatoid arthritis today. It is given by intramuscular injection. Its use can be associated with significant toxicity including severe skin rashes, severe anaphylaxis, nephrotoxicity, pulmonary fibrosis and irreversible skin pigmentation. There are some people who had responded well to this treatment and remain on gold, despite having been taking it for quite a while.

Sulfasalazine

Sulfasalazine was developed specifically to treat rheumatoid arthritis. Common side effects include upper GI effects and rashes with less common of drug induced hepatitis, cytopenias and Stevens-Johnson syndrome.

Hydroxychloroquine

Hydroxychloroquine is an antimalarial medication used to treat rheumatoid arthritis, especially mild/moderate disease. It is often used in combination with other DMARDS. Common side effects include: gastro-intestinal disturbances, headache, skin rashes and pruritus.

Other DMARDS include: Leflunomide, Penicillamine, Azathioprine, Cyclophosphamide, Ciclosporin, Tacrolimus, Mycophenolate Mofetil and Minocycline.

As it is now known that rheumatoid arthritis can progress rapidly to joint damage, the trend is towards beginning DMARDS early following diagnosis, although debate continues as to whether combination therapy or monotherapy is best.

NICE guidance advises the following:

- In people with newly diagnosed active rheumatoid arthritis, offer first-line treatment with DMARD monotherapy using oral methotrexate, leflunomide or sulfasalazine as soon as possible and ideally within 3 months of onset of persistent symptoms.
- Consider hydroxychloroquine for first-line treatment as an alternative to oral methotrexate.
- Consider leflunomide or sulfasalazine for mild or palindromic disease.
- Escalate dose as tolerated.
- Consider short-term bridging treatment with glucocorticoids (oral, intramuscular or intraarticular) when starting a new DMARD.

2.2.2 Biological therapy

Biological therapies to manage rheumatoid arthritis include, adalimumab, etanercept, infliximab, certolizumab pegol, golimumab, tocilizumab and abatacept, these tend to be prescribed in combination with methotrexate, where:

the disease is severe, and the disease has not responded to intensive therapy with a combination of conventional DMARDs.

Adalimumab, etanercept, certolizumab pegol or tocilizumab can be used as monotherapy for people who cannot take methotrexate because it is contraindicated or because of intolerance, when the criteria above are met.

Side effects of biological therapies can include:

- Infections, sometimes severe (including septicaemia)
- Nausea, abdominal pain, fever, headache
- Worsening heart failure
- Hypersensitivity reactions
- Depression
- Antibody formation
- Pruritus and injection-site reactions
- Blood disorders (including anaemia, leucopenia, thrombocytopenia, pancytopenia, and aplastic anaemia)

2.2.3 Corticosteroids

Corticosteroids have long been used in the management of rheumatoid arthritis because of their potent anti-inflammatory effects. They have a quick onset of action (which is useful while waiting for disease modifying medication to take effect). In addition, they offer multiple routes of administration (including oral, depot intramuscular and local intra-articular). Their use must be tempered against their known significant side effects from high or prolonged dosages.

Corticosteroids can be used in the following situations:

- In people with newly diagnosed rheumatoid arthritis to rapidly improve symptoms.
- Managing flare ups in people with recent- onset or established disease, to rapidly decrease inflammation.
- For severe extra-articular manifestations or life-threatening complications (e.g. severe serositis or vasculitis).

Long-term use of corticosteroids in rheumatoid arthritis should be considered only after careful evaluation the risks and all other treatment options have been considered.

Corticosteroid use is associated with significant side effects. The more common ones include:

- Suppression of hypothalamus-pituitary-adrenal axis.
- Cushing's syndrome (with high doses).
- Gastrointestinal effects: dyspepsia, acute pancreatitis, oesophageal ulceration and candidiasis.
- Musculoskeletal effects: muscle weakness, muscle wasting (proximal myopathy), osteoporosis with vertebral and long bone fractures, tendon rupture.
- Endocrine effects: hyperglycaemia and diabetes, weight gain.
- Neuropsychiatric effects: psychological dependence, insomnia, worsening of schizophrenia and epilepsy.
- Eye effects: glaucoma, papilloedema, cataracts, corneal / scleral thinning and exacerbation of ophthalmic viral or fungal disease.
- Other effects include: increased susceptibility to infection and impaired healing, skin atrophy, congestive heart failure and thromboembolism.

Side effects can be minimised by using lowest effective dose for the shortest period of time required.

2.3 Drugs used in Neuropathic Pain

Neuropathic pain occurs as a result of damage to neural tissue and can often be extremely difficult to treat. It will be described by different people in various ways such as burning, stinging, hot, numbness, altered sensation etc. Often the pain does not respond to conventional analgesia such as NSAIDs or opiates.

Neuropathic pain can occur as a result of conditions such as sciatica, cervical spondylosis with nerve root entrapment or conditions such as peripheral neuropathy.

Some common medications used for neuropathic pain include:

Amitriptyline

Amitriptyline was initially used as an anti-depressant however it has been found to be useful in managing neuropathic pain. Amitriptyline is a tricyclic antidepressant. It is now less commonly used as an antidepressant as other more modern classes of antidepressants have a better side effect profile and are less dangerous in overdose.

Amitriptyline has a number of recognised side effects such as sedation, dry mouth, etc. but sometimes the sedative aspects can be useful if dosage is taken at night to assist sleep disturbed by neuropathic pain.

Amitriptyline is thought to work in neuropathic pain by altering nerve transmission of pain.

If you see a claimant who is prescribed Amitriptyline, you must be careful to enquire about the reason for which it is prescribed. They may have been on it for many years for depression and Amitriptyline also has other uses such as migraine prophylaxis.

Pregabalin

Pregabalin has a number of uses. It works by binding to calcium channel receptors and thus decreases a number of neurotransmitters such as norepinephrine and glutamate.

Pregabalin has been found to be effective in control of neuropathic pain in some individuals.

It has a number of side effects including dizziness and drowsiness.

Other uses include epilepsy and anxiety disorder; so again, you must carefully enquire into what condition Pregabalin has been prescribed for.

Gabapentin

The exact mechanism of how Gabapentin works is not fully understood. It was initially developed to mimic effects of the neurotransmitter GABA but may also work on calcium channels and potentially other neurotransmitters.

It was originally used in the treatment of epilepsy but has been found to be of use in neuropathic pain.

Gabapentin has a number of side effects including GI disturbances and CNS disturbances.

Like all medication potentially for neuropathic pain, you must make careful enquiry into the condition the Gabapentin has been prescribed for as it may be used in epilepsy, neuropathic pain and even in some mental health disorders such as anxiety, or other conditions such as fibromyalgia.

Nortriptyline

Nortriptyline is a tricyclic antidepressant that has also been found to be of use in neuropathic pain. It is sometimes better tolerated than Gabapentin but still has a similar side effect profile to other tricyclic antidepressants but also specific problems such as stomatitis, fatigue and diarrhoea.

Again, you must ensure clarity on the condition Nortriptyline is being prescribed for.

Capsaicin

Capsaicin is a topical medication used as an adjunct therapy in osteoarthritis of the knees or hands. It can also be used in neuropathic pain, but the side effect of a burning sensation often limits its use.

A topical patch is available for use under specialist supervision in neuropathic pain. It is derived from chilli peppers.

The exact mechanism of action is unclear, but it is thought that the burning sensation produced impacts on calcium channel function in nerves inhibiting neurotransmitters.

3. Respiratory Conditions

3.1 Overview

In conducting PIP Assessments, you will see a number of people with a variety of respiratory conditions.

The most common conditions you will encounter are asthma and Chronic Obstructive Pulmonary Disease (COPD). Understanding their medication and level of medication may help you to justify your opinion on level of disability that may be likely.

The British Thoracic Society in conjunction with NICE and SIGN have produced some excellent guidance on the management of COPD and Asthma including some excellent summaries in their "Quick Reference Guide" with details of the management of both asthma and COPD in very user-friendly diagrammatic form. It is highly recommended you read these to understand the "step by step" management of asthma and COPD. You can access these guidelines through the following link:

COPD – <https://www.nice.org.uk/guidance/ng115>

Asthma - <https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/>

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

3.2 Asthma and COPD

In the management of asthma and COPD a number of groups of drugs may be encountered.

3.2.1 B₂ agonists

There are two main groups of selective B₂ agonists - Selective beta₂ - adrenoceptor agonists and selective beta₂ stimulants. Effectively both these classes of drugs work through smooth muscle relaxation which in turn causes dilation of the airways. These drugs provide a more immediate relief in asthma or COPD and do not prevent further exacerbations. Examples are Salbutamol or Terbutaline. These are most commonly used in an inhaler form but can also be used in a nebuliser form or very occasionally tablet form. It is important to ascertain whether a claimant has a nebuliser at home and how often they use it as this may indicate a more severe level of disability.

The short acting B₂ agonists will only generally provide short term relief in asthma or COPD, however, long acting versions of the drug e.g. Salmeterol are often used in combination with inhaled steroids to provide more long-lasting effects.

3.2.2 Anti-Muscarinic Bronchodilators

Ipratropium is an inhaled or nebulised medication that is more commonly used in COPD than asthma but is sometimes useful in the management of chronic asthma or in an acute asthma attack in a nebulised form.

3.2.3 Corticosteroids

Inhaled corticosteroids are used in asthma where the individual has to use their B₂ agonist inhaler more than twice weekly. The corticosteroid works by reducing inflammation in the airways. Inhaled corticosteroids are used as a long-term maintenance therapy and not in the acute situation. Examples are Beclomethasone Dipropionate, Fluticasone Propionate, and Budesonide (again - it is worth looking at the BNF to gain familiarity with some trade names of these inhalers).

Corticosteroids will often be used in combination with long acting B₂ agonists in asthma and in COPD. Examples of the names of these are - Seretide and Symbicort. (Please refer to the BNF for other preparations).

Oral steroids tend to be used for short term management of exacerbations of asthma. In some people with more advanced COPD, long term oral steroids may be required. If someone mentions they have had oral steroids, you must ascertain if these are used long term or just during exacerbations. If they are used in exacerbations, you must enquire into the frequency of use. Regular requirement for oral steroids may suggest a more severe form of asthma or COPD.

3.2.4 Theophylline

Theophylline is a Xanthine based product that has bronchodilator properties. It may be used in a slow release tablet form for chronic asthma that is not controlled by inhalers. If a person is on Theophylline, you must carefully consider their level of disability in terms of respiratory function as it suggests a more significant form of asthma.

Aminophylline is an intravenous form of Theophylline used in the emergency treatment of asthma.

Theophylline must be used with caution in those with cardiac disease as it may provoke cardiac arrhythmias.

3.2.5 Cromoglicate

This form of medication can be used in inhaler form and is sometimes of use in prevention of asthma especially in children where an allergic basis has been identified.

3.2.6 Leukotriene Receptor Antagonists

These are used in tablet form in asthma. They may be effective when used alone or in combination with inhaled steroids. Examples are Montelukast and Zafirlukast.

3.2.7 Mucolytics

Mucolytic drugs help to make sputum less viscous and therefore may assist people with COPD with expectoration.

They are only used in people where a 4-week trial has been effective. Examples are Carbocisteine and Erdosteine.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

4. Cardiovascular Conditions

4.1 Overview

There are several groups of drugs that can be used in many different cardiac conditions, for example Beta-blockers may be used in hypertension, angina, arrhythmias and heart failure.

NICE have produced numerous guidelines on the management of common cardiovascular conditions such as Angina, Hypertension and Heart Failure. It is strongly recommended that you review these guidelines.

They are available at <http://www.nice.org.uk/guidance/>

SIGN also produce guidelines on the management of many common cardiac conditions and have some summaries of key recommendations you may find useful to refer to.

They are available at: <https://www.sign.ac.uk/our-guidelines.html>

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

4.2 Groups of Drugs

4.2.1 Antiplatelet/Anticoagulant Drugs

Aspirin is used to reduce the incidence of clot formation in those with cardiovascular disease. Traditionally, Aspirin may have been used in pain relief, but this is now very uncommon.

Generally, Aspirin should be prescribed for all people with coronary heart disease unless there are problematic side effects.

Clopidogrel may be at times used where aspirin is not tolerated. Clopidogrel may also be used in combination with aspirin in very specific circumstances. (See BNF for further information).

Warfarin is an anticoagulant used in individuals where there is a risk of blood clots that could result in pulmonary embolism or cerebrovascular accidents (CVA).

It is commonly used in people with arrhythmias such as atrial fibrillation (AF) and in people with heart valves or post deep vein thrombosis (DVT).

4.2.2 Beta-Blockers

Beta-blockers or (Beta-adrenoceptor blocking drugs) block Beta receptors in a variety of areas in the body including the heart, peripheral vasculature and bronchi.

Beta-blockers reduce the heart rate and they are contraindicated in people with certain types of heart block and unstable heart failure. Some people with asthma cannot tolerate Beta-blockers because of their effect on the bronchi. Some Beta-blockers have an arteriolar vasodilating effect.

Beta-blockers can play a role in the management of Hypertension, Angina, Post myocardial infarct (MI), Arrhythmias and Heart failure.

Beta-blockers can also be used in other conditions such as thyrotoxicosis, anxiety, or prophylaxis of migraine. They are also used in glaucoma in a topical form.

This means that there is a clear need to identify the purpose of their medication - especially when it is used for non-cardiac conditions. A claimant who has both angina and hypertension may be unsure which drug is used for each condition, and you should use their overall level of medication as a piece of evidence in assessing likely level of function.

Examples of common beta-blockers include: Atenolol, Bisoprolol, Metoprolol Nebivolol.

Common side effects include fatigue, dizziness, blurred vision, nausea and diarrhoea, cold hands and feet and bradycardia.

4.2.3 Calcium Channel Blockers

There are a number of different types of calcium channel blockers and their mode and site of action can vary, with different therapeutic effects. Calcium channel blockers may be contraindicated in certain conditions such as heart failure where diltiazem and verapamil must be avoided.

Calcium channel blockers can be used in the management of Angina and Hypertension, with some types of calcium channel blockers also being used in arrhythmias. The individual's GP or cardiac specialist will select the most appropriate calcium channel blocker tailored to the needs of their patient.

Examples of common calcium channel blockers used include: Nifedipine, Nicardipine, Amlodipine, Felodipine and Verapamil.

Side-effects include flushing, headache, dizziness and ankle swelling.

4.2.4 Nitrates

Nitrates have a role primarily in the management of angina, but also may play a role in left

ventricular failure.

They act to dilate blood vessels, reducing myocardial work and therefore oxygen demand.

Short acting nitrates (e.g. GTN) are used for immediate relief of pain. Their effect lasts 20-30 minutes. Longer acting nitrates are also used in the management of angina/left ventricular failure and include Isosorbide Mononitrate and Isosorbide Dinitrate.

Side effects include headache, light-headedness, flushing and postural hypotension.

4.2.5 ACE (Angiotensin-converting enzyme) Inhibitors

ACE inhibitors work by inhibiting angiotensin converting enzyme.

ACE inhibitors can be used in the management of heart failure and hypertension and may also be used in the prevention of cardiovascular disease.

Common ACE inhibitors include Captopril, Ramipril and Enalapril and Perindopril.

Angiotensin II receptor antagonists work in a similar way to ACE inhibitors but are sometimes better tolerated and can be used in heart failure when the individual cannot tolerate the side effects of ACE inhibitors. Common examples are: Candesartan, Irbesartan, Losartan, Olmesartan, Telmisartan, and Valsartan.

4.2.6 Drugs used in lipid regulation

By far the most common group of drugs used in lipid regulation are the statins. This group of drugs inhibit an enzyme involved in cholesterol synthesis (HMG CoA reductase). These drugs are used in primary prevention of heart disease in people with specific risk factors such as diabetes, familial hypercholesterolemia, etc. and also in secondary prevention following an MI etc.

The statins are: Atorvastatin, Fluvastatin, Pravastatin, Rosuvastatin, and Simvastatin

Other lipid lowering drugs include fibrates, but these are now uncommonly used unless triglycerides are very high or a person is unable to tolerate statins. They are prescribed under specialist supervision.

4.2.7 Diuretics

There are 2 main classes of diuretics:

1. Loop diuretics. These drugs (Furosemide, Bumetanide and Torsemide) can be used in pulmonary oedema secondary to heart failure and also at times in hypertension. If a person is on loop diuretics, you should carefully consider functional impairment including breathlessness and fatigue.

2. Thiazide Diuretics. These drugs can be used to treat oedema associated with heart failure or can be used in a lower dose to treat hypertension.

The most commonly encountered thiazide diuretics used for management of hypertension are: Chlortalidone, Indapamide and Bendroflumethiazide.

In chronic heart failure, Spironolactone, an Aldosterone antagonist, can be used in combination with other drugs to treat individuals who remain symptomatic. If a claimant is prescribed Spironolactone, you should carefully consider whether significant functional impairment may be present.

4.2.8 Common Drugs used in arrhythmias

Digoxin: Digoxin has positive inotropic effects and thus can be used at times in the management of heart failure. It also has properties that affect the AV node and therefore is useful in controlling the ventricular response in atrial fibrillation or flutter.

Verapamil as a calcium channel blocker may be used in some supraventricular tachycardias.

Amiodarone can be used for a variety of arrhythmias - both ventricular and supraventricular.

4.2.9 Other Drugs

Nicorandil: This drug is a potassium channel activator and also has some nitrate properties. It can be useful in angina especially when used in combination with other drugs.

Ivabradine: This drug lowers the heart rate and can be useful in some patients with angina, but specific criteria apply. It may also be used in some cases of mild to moderate heart failure.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

5. Mental Health Conditions

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

5.1 Antidepressant Drugs

Ideally, antidepressant drugs should not be used routinely in mild depression. Counselling / cognitive behavioural therapy (CBT), either one to one or group, and/or a structured physical activity programme are proposed by the NICE guidelines <http://www.nice.org.uk/guidance/NG222> as part of a 'stepped care' model for those with mild depression.

Anti-depressants should be considered for people with:

- A past history of moderate or severe depression
- Initial presentation of sub threshold depressive symptoms that have been present for a long period - typically at least 2 years. (See NICE guideline listed above for information on classification)
- Sub threshold depressive symptoms or mild depression that persists after other interventions.

Antidepressant drugs are effective for treating moderate to severe depression associated with psychomotor and physiological changes such as loss of appetite and sleep disturbance (reference from BNF).

The choice of antidepressant should be based on the individual's requirements, including the presence of concomitant disease, existing therapy, suicide risk and previous response to antidepressant therapy.

Selective Serotonin re-uptake inhibitors (SSRI's) are better tolerated and are safer in overdose than other classes of anti-depressants and should be considered first line for treating depression.

Suicidal behaviour/ideation has been linked to antidepressants. Especially at risk are young adults and people with a history of suicidal behaviour. Therefore, at the beginning of treatment or if the dose is changed these individuals should be monitored closely for suicidal behaviour, self-harm or hostility by those involved in their treatment such as their GP, CPN or psychiatrist.

5.1.1 Tricyclic and Related Antidepressants

Examples of these are:

Amitriptyline, Clomipramine, Dosulepin, Doxepin, Mianserin, Trazodone, Trimipramine, Imipramine, Lofepramine, Nortriptyline.

Tricyclic antidepressants have similar efficacy to SSRI's but are more likely to be discontinued because of side-effects. These medications work by blocking the re-uptake of both serotonin and noradrenaline and therefore increase production of these. Overdose of tricyclic antidepressants can lead to toxicity.

Some tricyclic antidepressants can be sedating (Amitriptyline, Clomipramine, Dosulepin, Doxepin, Mianserin, Trazodone and Trimipramine) or less sedating (Imipramine, Lofepramine and Nortriptyline).

Amitriptyline and Dosulepin are effective but they are particularly dangerous in over dosage and are not recommended for the treatment of depression. Some of these drugs (particularly Amitriptyline and Nortriptyline) **are used in the treatment of pain management and the specific use should be recorded in reports (i.e. should not be recorded as being used as an anti-depressant when it is being used for pain management). You must be very careful to take an adequate history to ascertain the condition for which the drug is prescribed for, especially when multiple medical conditions are present**

The main side-effects of tricyclic antidepressants include:

- Arrhythmias and heart block, postural hypotension, tachycardia and ECG changes.
- Central nervous system side-effects are common and include anxiety, dizziness, agitation, confusion, sleep disturbances, irritability, and paraesthesia. Convulsions, hallucinations, delusions, mania and hypomania may occur and rarely extrapyramidal symptoms including tremor and dysarthria
- Antimuscarinic side-effects include dry mouth, blurred vision (very rarely precipitation of angle-closure glaucoma), constipation (rarely leading to paralytic ileus) and urinary retention.
- Neuroleptic malignant syndrome may occur very rarely.

5.1.2 Selective Serotonin Re-uptake Inhibitors (SSRI's)

These work by selectively inhibiting the re-uptake of serotonin a neurotransmitter. The lack of Serotonin has been identified as a factor in depression.

They are less sedating and have fewer antimuscarinic and cardiotoxic effects than tricyclic antidepressants. These medications are the most commonly used.

Examples of these are:

Citalopram – This is the most commonly used anti-depressant. Starting dose is 20 mg and maximum dose is 40 mg. The maximum dose was reduced from 60 mg as this medication was found to increase susceptibility to QT interval prolongation. It is indicated for treatment of

depressive illness and panic disorder.

Fluoxetine – This is the second most commonly used medication for depression after Citalopram. Starting dose is 20 mg and 60 mg is the highest dose. The BNF provides dosing information for use in major depression, bulimia nervosa and obsessive compulsive disorder (OCD)

Sertraline – This is the fourth most commonly used medication after Citalopram, Fluoxetine and Mirtazapine. The BNF provides dosing information for depressive illness, OCD, panic disorder, post-traumatic stress disorder and social anxiety disorder. Typically start dose for depression is 50mg with a maximum of 200mg increasing in increments of 50mg.

Others include: Escitalopram, Fluvoxamine and Paroxetine

The most common side effects for these drugs include:

- Gastro-intestinal effects which are dose-related and fairly common – nausea, vomiting, dyspepsia, abdominal pain, diarrhoea and constipation. Anorexia with weight loss (increased appetite and weight gain also reported)
- Hypersensitivity reactions including rash
- Other less common side-effects include dry mouth, nervousness, anxiety, headache, insomnia, tremor, dizziness, asthenia, hallucinations, and drowsiness. Convulsions, urinary retention, hypomania or mania, movement disorders and dyskinesias and visual disturbances.

5.1.3 Monoamine Oxidase Inhibitors (MAOI's)

These are used much less frequently than other anti-depressants because of the dangers of dietary and drug interactions. Use is usually reserved for specialists. They may be used for the treatment of depression and phobias. There are dietary restrictions associated with these drugs.

Examples of these are:

Phenelzine, Isocarboxazid, Tranylcypromine, Moclobemide

5.1.4 Antidepressants not easily classified

These drugs work in various different ways by either increasing or inhibiting the production of neurotransmitters and/or hormones.

Examples include:

Mirtazapine – The third most common anti-depressant seen at assessment this medication increases central noradrenergic and serotonergic neurotransmission. It causes sedation during initial treatment. Starting dose is 15 mg and this can be increased up to 45 mg. The

BNF indication is for major depression. This medication can cause withdrawal symptoms of nausea, vomiting, dizziness, agitation, anxiety and headache if stopped suddenly and dose should be reduced over several weeks.

Venlafaxine – This is another commonly used anti-depressant. Indications are for major depression and generalised anxiety disorder. Dose is 75mg to 375 mg daily. This medication can cause withdrawal symptoms of nausea, gastro-intestinal disturbance, dizziness, paraesthesia, tremor, sleep disturbance, sweating and headache if stopped suddenly and dose should be reduced over several weeks.

Others include Agomelatine, Duloxetine and Reboxetin

5.1.5 Antipsychotic Medication

These drugs may also be prescribed for individuals who do not have psychotic symptoms such as delusions or hallucinations but require medication to manage aggressive impulses or severe anxiety/agitation. They can cause a range of side-effects, particularly extra-pyramidal symptoms such as parkinsonian symptoms (including tremor), dystonia (abnormal face and body movements), restlessness and tardive dyskinesia (rhythmic, involuntary movements of tongue, face and jaw). These types of side-effects are easy to recognise but cannot be predicted accurately because they depend on the dose, the type of drug and individual susceptibility. Anti-psychotic drugs are powerful with numerous fewer common side-effects some of which can be very serious and the BNF describes these in detail.

There are many anti-psychotic medications. Those commonly seen at assessment are second generation anti-psychotic drugs that can have fewer side-effects. The three most likely to be seen are;

Quetiapine – This anti-psychotic medication is indicated for use in schizophrenia, mania, either alone or with mood stabilisers; depression in bipolar disorder; adjunctive treatment in major depressive disorder. Normal starting dose is 50 mg, and this can be increased to a maximum of 750 mg as indicated.

Olanzapine – Indicated for use in schizophrenia, combination therapy for mania and preventing recurrence in bipolar disorder. Dose is 5-20 mg daily.

Risperidone – Indicated for acute and chronic psychoses, also in the short term treatment of mania (up to 6 weeks), in Alzheimer's (short term use only) and conduct disorder. Dose 2mg-16mg maximum.

In severe mental illness anti-psychotic medication can be given by depot injection. This is prescribed by a psychiatrist and would normally be given by a CPN every 2-4 weeks. The purpose of giving medication in this way is to try and maintain stability in individuals who are not able to reliably manage oral medication. A claimant with this treatment is likely to have a care plan in place. If a claimant is seen for a face to face assessment and is prescribed depot medication, their level of insight should be assessed.

Examples of medications used in this way are:

Fluphenazine decanoate, Flupenthixol decanoate, Haloperidol decanoate, Pipotiazine palmitate, Zuclopenthixol decanoate, Risperidone, Paliperidone, Olanzapine embonate, Aripiprazole

5.2 Drugs used in mania and hypomania

Bipolar disorder can be a severe condition and can have a significant impact on function. Many people with bipolar disorder will often be on an antidepressant drug for the depressive symptoms but will require different medication for the management of symptoms of mania or hypomania.

5.2.1 Lithium

Lithium can be used both for prevention and treatment of mania and hypomania. It can also be used to treat depressive symptoms in bipolar disorder. It can also be used in the management of self-harm or aggressive behaviour.

Lithium is prescribed under specialist supervision and when used in the long term can be associated with a number of side effects including disturbance of thyroid function and cognitive impairment. There is a requirement for monitoring of bloods regularly to prevent lithium toxicity. (See BNF for further details).

5.2.2 Valproate

Valproic Acid and Sodium Valproate can be used in the management of mania in bipolar disorder. It may be used as a standalone therapy for mania or used in combination with lithium or some antipsychotics. Sodium Valproate can also be used for prophylaxis of mania in bipolar disorder.

Forms of Valproate can also be used in the management of epilepsy, so you need to take a careful history to establish what condition the medication is prescribed for.

5.2.3 Antipsychotic drugs used in mania and hypomania

A number of the antipsychotic drugs can also be used in the management of acute episodes of mania and hypomania. These may be used alone or in combination with Lithium or Sodium Valproate.

The most commonly used antipsychotics in mania include Olanzapine, Quetiapine, or Risperidone although some newer drugs such as Asenapine, have also been used.

5.2.4 Mood Stabilisers

Medications such as Carbamazepine and Lamotrigine can be used in the long-term management of bipolar disorder and other mood disorders but only under specialist

supervision where other therapies have failed to control the condition.

5.2.5 Benzodiazepines

Benzodiazepines may be helpful in controlling agitation in the acute phases of mania, but because of the potential for addiction, these drugs are only used for very short periods.

5.3 Drugs used in the management of Anxiety Disorders.

First line management of anxiety will normally involve supportive therapies such as counselling and CBT. Where conservative measures do not help, some medication can be tried.

5.3.1 Benzodiazepines

Benzodiazepines may have a role in the short-term management of anxiety but should not be used in the long term due to significant addictive potential.

5.3.2 Buspirone

This medication may be used in the short term to relieve symptoms of anxiety. It is not normally used for chronic management of anxiety symptoms.

5.3.3 Beta-Blockers

Beta-blockers do not have any impact on psychological issues in anxiety, but may help with symptoms such as tachycardia, sweats and tremor found in people with anxiety disorders.

5.3.3.1 Antipsychotics

Occasionally, some antipsychotics can be used in the management of anxiety in a very low dose such as Chlorpromazine or Haloperidol. These are normally used mainly in more elderly populations. They should be used in caution due to side effects.

5.3.3.2 Antidepressants

Some antidepressants such as Escitalopram, Sertraline and Paroxetine can be helpful in the management of anxiety disorders where conservative measures have failed.

Duloxetine and Venlafaxine may also be used in anxiety disorders.

5.3.3.3 Pregabalin

This drug may be considered where other medications such as antidepressants have failed.

Again, because many medications have multiple uses in different medical conditions, you must ascertain what condition the drug is being prescribed for.

5.3.3.4 Nocturnal sedation

Medication such as Zopiclone or Zolpidem may be prescribed for the short-term treatment of sleep problems. These are taken at night and should normally not be used for more than 4 weeks.

5.4 Drugs used in the management of addiction

5.4.1 Opiate Addiction

Opiate addiction can be managed by substitution therapy with either Methadone or Buprenorphine.

Opiate substitution is only given after careful consideration and is administered on a supervised basis.

NICE have provided guidance on opiate substitution therapy that can be found at:

<http://www.nice.org.uk/guidance/TA114>

Naltrexone is an opiate antagonist that can be used in some individuals to prevent relapse in opiate misuse.

5.4.2 Alcohol Addiction

Counselling plays an important role in the management of alcohol dependency, but some drugs can be used.

5.4.2.1 Acute withdrawal

Chlordiazepoxide (a long acting benzodiazepine) can be used for the treatment of alcohol withdrawal either as an inpatient or supervised as a gradual reduction regime in the general practice setting.

If benzodiazepines are contraindicated, Carbamazepine is sometimes used.

Those with severe agitation may also be prescribed antipsychotics during the withdrawal phase.

5.4.2.2 Maintenance

Acamprosate and Naltrexone can be used as maintenance therapy to prevent relapse of alcohol use in suitable individuals.

5.5 Doses of the most commonly prescribed mental health drugs

It is important to be aware of the relevance of doses. Higher doses of medication or multiple medications may indicate increased severity of a condition. Levels of medication could relate to other factors such as the claimant's weight and tolerance of medication.

The following dosage information is from the BNF:

Fluoxetine – starting dose 20mg/day to 60 mg maximum

Citalopram – starting dose 20mg/day to 40 mg maximum

Paroxetine – starting dose 20 mg/day to 50mg maximum

Sertraline – starting dose 50mg/day to 200mg maximum

Trazodone – starting dose 150mg/day to 300mg maximum

Dosulepin – starting dose 75mg/day to 150mg maximum

Doxepin – starting dose 75mg/day to 300mg maximum

Mirtazapine – starting dose 15-30mg/day to 45 mg maximum

Venlafaxine – starting dose 75mg/day to 375mg maximum

Quetiapine – starting dose 50 mg/day to 750mg maximum

Olanzapine – starting dose 5mg/day to 20mg maximum

Risperidone – starting dose 2mg/day to 16mg maximum.

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6. Gastro-Intestinal (GI) Disorders

6.1 Overview

There are a number of GI conditions you will encounter fairly frequently when completing PIP Assessments. Below are details on medication used in some of the most common disorders seen. You should refer to the BNF for information if a person has listed medication in their form that you are not familiar with.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

6.2 Irritable Bowel Syndrome

Irritable bowel syndrome (IBS) is a common disorder. Some people with the condition will not be on medication for the syndrome, however; other people will require medication, and this can be useful in estimating the severity of their condition and the likely symptoms associated. In IBS, several dietary changes can be made to help alleviate symptoms and psychological therapies also play an important role in the management of the condition. Below is an overview of the types of medication a person may be taking.

Medication needs to be adjusted depending on the symptoms and the individual should be advised on how to titrate the dose and type of medication to achieve normal stool consistency

6.2.1 Fibre supplements (linseeds)

These may be required if dietary fibre is ineffective for cases where constipation predominates. Examples are Ispaghula Husk (Fybogel and Regulan), methyl cellulose (Celevac) and sterculia (Normacol). Lactulose is not normally used as it exacerbates bloating.

6.2.2 Antispasmodic agents

Medication such as Hyoscine or Mebeverine may be beneficial to reduce abdominal spasms and cramps.

Peppermint oil may also be used to alleviate symptoms of bloating and spasm.

6.2.3 Anti-diarrhoeal agents

If diarrhoea predominates, Loperamide is the first choice of treatment

6.2.4 Psychological Medication

If other medication is not helpful, tricyclic antidepressants, such as Amitriptyline, can be used as second line treatment in IBS-D – usually at low dosages.

If tricyclics are ineffective, selective serotonin reuptake inhibitors (SSRIs), such as Citalopram, Fluoxetine or Paroxetine, may be tried especially if pain is a predominant symptom.

6.3 Inflammatory Bowel Disease

The inflammatory bowel diseases (Crohn's disease and Ulcerative colitis) can be complex to manage. The person's level of medication can give you some indication of severity, especially if they require regular courses of steroids. You must carefully enquire about variability of condition and flare ups and how often these happen.

6.3.1 Crohn's disease

6.3.1.1 Glucocorticosteroids

Glucocorticosteroids (e.g., Prednisolone, Methylprednisolone, Intravenous Hydrocortisone) can be used to induce remission in people with a first presentation or single inflammatory exacerbation of Crohn's in a 12-month period. Glucocorticosteroids should not be used as monotherapy to maintain remission once this is achieved.

If conventional glucocorticosteroid are not tolerated, Budesonide may be used. This should not be given for severe presentations or exacerbations of the disease.

6.3.1.2 Aminosalicylates

Aminosalicylates are chemical derivatives of 5 - aminosalicylate. The preparations are: Sulfasalazine, Mesalazine, Balsalazide and Olsalazine. If there are 2 or more inflammatory exacerbations in a 12-month period or the glucocorticosteroid dose cannot be tapered, then Azathioprine or Mercaptopurine may be added to the dose of glucocorticosteroid to induce remission.

These drugs should not be used as first line monotherapy to induce remission, however once remission is achieved, they may be used as monotherapy to maintain remission. Aminosalicylates can improve control of the condition but all can have significant side effects that may limit use.

6.3.1.3 Other drugs

Mercaptopurine

Mercaptopurine is a cytotoxic drug with immunosuppressive action. It can be used in severe acute attacks of Crohn's disease and in the longer term for control.

Methotrexate

If Azathioprine or Mercaptopurine cannot be tolerated, Methotrexate may be added to the glucocorticosteroid to induce remission. Once remission is achieved, Methotrexate may be

given as monotherapy in people who failed to respond to Azathioprine or Mercaptopurine or have contraindications to their use.

Biologic medications

Failure to respond to conventional therapy, with persistence of severe active Crohn's disease, may be treated by biologic medications. These should be given to trigger remission and thereafter maintain remission; this can be until the medication fails through evidence of flare and the medication can then be changed to an alternative biologic. Regular specialist review and monitoring is necessary. For further information refer to the BNF as well as the earlier section in this workbook under rheumatoid arthritis as the biologic treatments are very similar for both conditions.

Following surgery, patients can still experience flare of Crohn's as surgery is unfortunately not a cure and the Crohn's can recur in other areas of the gut so patients may still be prescribed any of the above treatments following surgery to either treat or manage relapses.

6.3.2 Ulcerative Colitis

6.3.2.1 Corticosteroids

Corticosteroids – suppositories, enemas or oral – may be used in mild cases in combination with other medication. They are not recommended for long term use or maintenance therapy due to their side effects.

6.3.2.2 Aminosalicylates

Aminosalicylates – Sulphasalazine, 5-aminosalicylic acid, Mesalazine – used in mild / moderate exacerbations or to maintain remission.

6.3.2.3 Immunosuppressants

Immunosuppressants –Azathioprine, Ciclosporin – used in severe or resistant cases or for maintenance therapy –alone or in combination with other medication.

6.3.2.4 Biologic Agents

Biologic agents – Infliximab, adalimumab and golimumab are biologic agents approved for use in severe cases of ulcerative colitis.

6.3.2.5 Other

Other medication may be required to control specific symptoms, such as nausea or diarrhoea.

6.4 Diverticular Disease

Diverticular disease is mainly managed through dietary advice and increasing fibre intake.

Laxatives and bulking agents may be used where dietary measures fail.

6.5 Peptic Ulcer Disease

6.5.1 Proton Pump Inhibitors

Proton pump inhibitors (PPIs) such as Lansoprazole or Omeprazole are first-line treatments – usually as a single dose 30 minutes before food – over 80% of duodenal ulcers heal with a 1-month course of this medication. Individuals may remain on a maintenance dose indefinitely if the individual also takes NSAIDs.

6.5.2 Triple Therapy

Triple therapy for eradication of *Helicobacter pylori* – consisting of a PPI together with a combination of 2 antibiotics (either Amoxicillin and Clarithromycin or Metronidazole and Clarithromycin if penicillin allergic) - usually given for 7 days.

6.5.3 H2 receptor antagonists

H2 receptor antagonists such as Ranitidine or Cimetidine can be used in people who are intolerant of PPIs.

6.6 Bowel Incontinence- management of diarrhoea

6.6.1 Loperamide

Loperamide – first choice – can be used long term in doses of 0.5 mg – 16 mg per day as necessary. It should be started at a low dose and increased as necessary. The dose should be titrated by the individual according to the stool frequency and consistency. It should be avoided in people with hard stools, in an acute flare up of ulcerative colitis or in cases of acute diarrhoea where the cause is still not identified.

6.6.2 Antimuscarinics (previously referred to as Anticholinergic Medication)

Antimuscarinics reduce intestinal secretions and bowel movement. Examples include: Dicycloverine hydrochloride and Hyoscine.

6.6.3 Opium derivatives

These drugs increase intestinal tone and reduce bowel movement.

6.6.4 Activated charcoal

Reduces water content in stool.

7. Renal Disorders

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7.1 Chronic Kidney Disease (CKD)

Appropriate management of hypertension, diabetes, hypercholesterolaemia, anaemia, osteoporosis or any other medical condition, should be made in keeping with the guidelines for the specific condition.

7.1.1 Ace Inhibitors

Angiotensin converting enzyme (ACE) inhibitors are often used to treat hypertension in people with CKD.

7.1.2 Antiplatelet medication

Antiplatelet medication may be given to individuals with CKD to prevent cardiovascular disease. Apixaban may be considered instead of Warfarin for some people.

7.1.3 Vitamin D

Vitamin D supplements should be given to individuals with Vitamin D deficiency however they should not be given routinely in CKD.

7.1.4 Bicarbonate

Oral bicarbonate supplements may be required to treat metabolic acidosis.

7.1.5 Immunosuppressive regimes following transplant

Immunosuppressant medication includes:

7.1.5.1 Glucocorticoids

Prednisolone, Methylprednisolone

7.1.5.2 Small molecule drugs

Immunophilin-binding drugs – calcineurin inhibitors (Ciclosporin, Tacrolimus); or Target-of-rapamycin inhibitors (Sirolimus, Everolimus)

Inhibitors of nucleotide synthesis – purine synthesis inhibitors (Mycophenolate Mofetil, enteric coated Mycophenolic acid, Mizoribine); or pyrimidine synthesis inhibitors (Leflunomide, FK778, Azathioprine, FTY720).

7.1.5.3 Protein drugs

Depleting antibodies – polyclonal antibody (horse or rabbit antithymocyte globulin); mouse monoclonal anti-CD3 antibody (muromonab-CD3); humanised monoclonal anti CD-52 antibody (Alemtuzumab); or B-cell-depleting monoclonal anti-CD-20 antibody (Rituximab).

Non-depleting antibodies and fusion proteins – humanised or chimeric monoclonal anti-CD25 antibody (Daclizumab, Basiliximab); or fusion protein with natural binding properties (Belatacept).

7.1.6 Other Drugs

- Intravenous gamma globulin
- C5 inhibitor – Eculizumab
- Protease inhibitor - Bortezomib

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8. Urinary Disorders

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8.1.1 Urinary Incontinence

Incontinence as a result of Detrusor instability is managed usually through a combination of drug therapy and other conservative measures such as pelvic floor exercises and bladder training.

Stress incontinence is usually managed through conservative measures such as pelvic floor training, however; Duloxetine (an antidepressant) can also be used to treat moderate to severe stress incontinence in some women.

The drugs we most commonly encounter are Oxybutynin and Tolterodine but other newer medications are available, and you should refer to the BNF for further information.

9. Diabetes

9.1 Overview

As diabetes is a significant risk factor for cardiovascular disease, all associated issues such as hypertension and hypercholesterolemia should be addressed.

Cardiovascular risk can be reduced in diabetes by prescribing ACE inhibitors, aspirin and lipid regulating drugs.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

9.2 Type 1 Diabetes

The main stay of treatment of type 1 diabetes is through administration of insulin.

There are multiple types of insulin delivered through many different devices. They come in long and short acting preparations.

The dosage regime for each person is carefully established by their clinical team.

People with diabetes - especially those on insulin may be subject to occasional hypoglycaemic episodes and may therefore mention they carry medication such as glucagon. Glucagon is given by injection and converts stores of glycogen in the body to glucose in the event of a hypoglycaemic episode when the individual is unable to swallow a sugary substance such as lucozade. It is important to establish if a person mentions hypos whether they manage to take a sugary substance themselves or whether they have to have glucagon injected.

9.3 Type 2 Diabetes

The management of type 2 diabetes is initially through dietary control. If a person fails to respond through a conservative approach, a number of different tablets may be used. Some people with type 2 diabetes will also require additional insulin where tablet therapy does not adequately control their blood sugar.

9.3.1 Sulphonylureas

Sulphonylureas increase the production of insulin in the pancreas. Examples are Glibenclamide, Gliclazide or Tolbutamide. A sulphonylurea can be used alone or in combination with other types of antidiabetic drugs.

9.3.2 Biguanides

The only available biguanide is Metformin. It works by decreasing gluconeogenesis and increasing the utilisation of peripheral stores of glucose.

9.3.3 Other

There are a number of other drugs that can be used to regulate blood sugar. The most common of these are Pioglitazone and Acarbose.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

10. Epilepsy

10.1 Overview

People with epilepsy may be managed on a single epilepsy drug and achieve good control of seizures.

Some people will require multiple medications. A person seeing a neurologist and on multiple medications may well still have poor seizure control.

It is important to enquire about dosage and any recent alteration to their medication.

The choice of antiepileptic medication is usually based on the type of the epileptic seizure. More information on the specific choice of medication is available in the NICE Clinical Guideline 137, relevant medical textbooks or in the British National Formulary.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

10.2 Common epilepsy medication

Some common antiepileptic medications include:

Carbamazepine, Phenytoin, Phenobarbital, Primidone, Valproate, Lamotrigine
Clobazam, Clonazepam, Topiramate, Levetiracetam Gabapentin, Pregabalin

Other slightly less common drugs we might see include:

Zonisamide, Oxcarbazepine, Eslicarbazepine, Perampanel, Retigabine
Rufinamide, Lacosamide, Tiagabine, Ethosuximide, Vigabatrin

There are a large number of side effects with anti-epileptic medication and sometimes these can be so significant that people will have to stop their medication and be changed to another. It is therefore important to enquire about the person's medication history as well if they are reporting an increase in seizure activity.

11. HIV (Human Immunodeficiency Virus) Infection

11.1 Overview

Although there is no cure for HIV infection, the management of HIV has advanced significantly in recent years with multiple antiretroviral medications now available which slow or halt disease progression.

The decision on when to start anti-retroviral medication is complex and governed by a large number of factors.

There are multiple side effects associated with many of medications in use and it is important you review these in the BNF and take these issues into account when assessing function in a person with HIV.

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

11.2 Nucleoside reverse transcriptase inhibitors

Nucleoside reverse transcriptase inhibitors block the copying of the viral RNA during the replication process, making the virus more susceptible to destruction by cellular enzymes.

Nucleoside reverse transcriptase inhibitors licensed for use in the UK are:

- Zidovudine, Didanosin, Emtricitabin, Lamivudine, Stavudine, Abacavir, Tenofovir

11.3 Non-nucleoside reverse transcriptase inhibitors

Non-nucleoside reverse transcriptase inhibitors cause changes in the active site of the reverse transcriptase enzyme resulting in inhibition of enzyme activity. They are highly specific in that they block replication of HIV-1 but not HIV-2.

Non-nucleoside reverse transcriptase inhibitors licensed for use in the UK are:

- Efavirenz, Etravirine, Nevirapine, Rilpivirine

11.4 Protease inhibitors

Protease inhibitors bind to the viral protease affecting replication resulting in the production of immature virus cells that are unable to infect other cells.

Protease inhibitors licensed for use in the UK are:

- Atazanavir, Darunavir, Fosamprenavir, Indinavir, Lopinavir with ritonavir, Ritonavir, Saquinavir, Tipranavir

11.5 Other Antiretrovirals

Integrase inhibitors

Integrase inhibitors block HIV integrase, preventing the integration of proviral DNA into host DNA thereby blocking viral replication.

Integrase inhibitors licensed for use in the UK are:

- Raltegravir
- Elvitegravir (however this is only available as part of a combination product containing Cobicistat, Emtricitabine, and Tenofovir Disoproxil)

Fusion inhibitors

Fusion inhibitors prevent entry of HIV into the cell.

Fusion inhibitors licensed for use in the UK are:

- Enfuvirtide

Unlike the other antiretroviral medications that are all administered orally, Enfuvirtide is administered by subcutaneous injection twice a day. Its use is restricted to managing infection that has failed to respond to other antiretroviral drugs.

Chemokine receptor antagonists

Chemokine receptor antagonists affect viral replication by blocking entry of HIV into the host cell.

There is one chemokine receptor antagonists licensed for use in the UK (except Scotland):

- Maraviroc (specifically for people infected with CCR5-tropic HIV)

NAM maintains a comprehensive resource of current HIV treatment that is regularly updated, which can be found here: <https://www.aidsmap.com/topic/hiv-treatment>

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

12. Hepatitis B

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

Hepatitis B is a fairly commonly encountered condition. Decisions on when to commence treatment for the condition depend on a number of different factors including the impact on the liver.

Below is a summary of the common treatments used for Hepatitis B.

NICE guidelines (<https://www.nice.org.uk/guidance/cg165>) indicate that first line treatment for chronic hepatitis B (in compensated liver disease) should be a course of Peginterferon alfa-2a. Pegylated interferon is a longer lasting form of Interferon. It is usually given by injection once a week for 48 weeks. Peginterferon alfa is contra-indicated in decompensated liver disease.

With Pegylated Interferon Alfa, side effects of treatment are common and can be severe. Flu-like symptoms (such as fever, chills, myalgias, arthralgias and headache) are commonly reported. Decreased white cell and platelet counts are also common. Other side effects include emotional lability, depression and anxiety, which can be severe. Cardiovascular effects include hypertension or hypotension, arrhythmias, oedema, myocardial infarction or stroke. Side effects can be long term and can last for several years after stopping or completing the treatment.

Tenofovir Disoproxil (acyclic nucleotide analogue of adenosine) may be offered as second line treatment to individuals who do not undergo HBeAg seroconversion or who relapse after first line treatment with Peginterferon alfa. This is usually given as a single daily oral dose. Side effects of Tenofovir include nausea, vomiting, diarrhoea, dizziness, skin rash, malaise, and more rarely, kidney problems. A rare complication of nucleoside analog medication is lactic acidosis.

For people who cannot tolerate Tenofovir, or in whom it is contraindicated, Entecavir (nucleoside analogue drug with selective anti-hepatitis B virus activity) may be offered as second line treatment. This is also usually given as a single oral daily dose. Side effects of Entecavir include nausea, vomiting, insomnia, and dizziness.

Women who are pregnant or breast-feeding should be offered Tenofovir Disoproxil in the third trimester if their HBV DNA is greater than 10^7 IU/ml, to reduce the risk of transmission of HBV to the baby.

13. Hepatitis C

This is an overview and brief guide, all HPs should utilise the BNF on the following link <https://bnf.nice.org.uk/drug/> for up to date medication information.

Hepatitis C can be treated with antiviral medication, which aims to stop the virus from replicating. The response to treatment is monitored by measuring the level of serum HCV RNA. The aim is for a 'sustained virological response' with the level of HCV RNA being undetectable 6 months after completing treatment.

Several factors affect the efficacy of treatment. The most important is the genotype of the virus. Genotype 1 is associated with a poorer treatment outcome. High viral loads, older age, obesity, the presence of cirrhosis, continued alcohol use, immunosuppression and longer duration of infection are all also associated with poorer treatment outcomes.

The usual treatment, as detailed in the NICE guidance, for people with chronic hepatitis C infection is combination therapy with Pegylated/non-pegylated Interferon Alfa plus Ribavirin for a duration of between 24 and 48 weeks depending on the genotype of the HCV. Pegylated Interferon is a longer lasting form of interferon. Interferon Alfa is given intravenously while Ribavirin is given orally.

Side effects of combination therapy with Interferon Alfa and Ribavirin are common (up to 75% of people) and can be so unpleasant that people will discontinue treatment because of them. There is no way of predicting those who will be affected by side effects nor the degree to which they will experience those side effects.

Common side effects of Interferon Alfa include pyrexia, fatigue (which can be extreme), nausea, headaches, myalgia and insomnia. Less common effects include pruritus, arthralgia, alopecia, rigors, anorexia, nausea and vomiting, colitis and anxiety and depression. Haemolytic anaemia is the most common side effects of Ribavirin. Other common side effects of include: cough, nausea, rash and teratogenicity. Less common side effects are peptic ulcers, interstitial pneumonitis and aplastic anaemia.

Historically the response rate (with clearing of the virus) has been that less than about 50% for people infected with genotype 1, whereas with genotypes 2 and 3 the response rate is around 80%.

Recently two new protease inhibitors which block viral replication, Telaprevir and Boceprevir, have been approved to be used in the treatment in people with genotype 1 hepatitis C (as per NICE guidance). They specifically act only against genotype 1 of the virus. They are usually given with Interferon Alfa and Ribavirin treatment, and the regime is known as triple therapy. Telaprevir and Boceprevir are both given orally and can be used in people who do not respond to the more usual conventional combination therapy, or new cases of genotype 1 infection. They greatly increase the probability of someone clearing the virus through treatment.

Side effects of Boceprevir are common and include flu-like symptoms such as a high temperature, poor appetite with nausea and vomiting, anaemia, neutropenia, altered taste sensation, fatigue, dizziness, diarrhoea, dry mouth and dry skin, arthralgia and alopecia.

The common side effects of Telaprevir include anaemia, anal symptoms (including pain and pruritis), nausea, vomiting, diarrhoea, fatigue, elevated uric acid levels, pruritic skin rashes and taste abnormalities. Less common side effects include reductions in white cell and platelet counts, pyrexia, depression, insomnia, headache and myalgia.

Relapse from treatment is the reappearance of the HCV RNA during follow-up within 24 weeks of treatment.

Even if the virus is successfully cleared with treatment, the individual is not immune to future infections of hepatitis C. If the individual continues (for example) to inject drugs after having treatment, there is a continuing risk of becoming re-infected with hepatitis C.

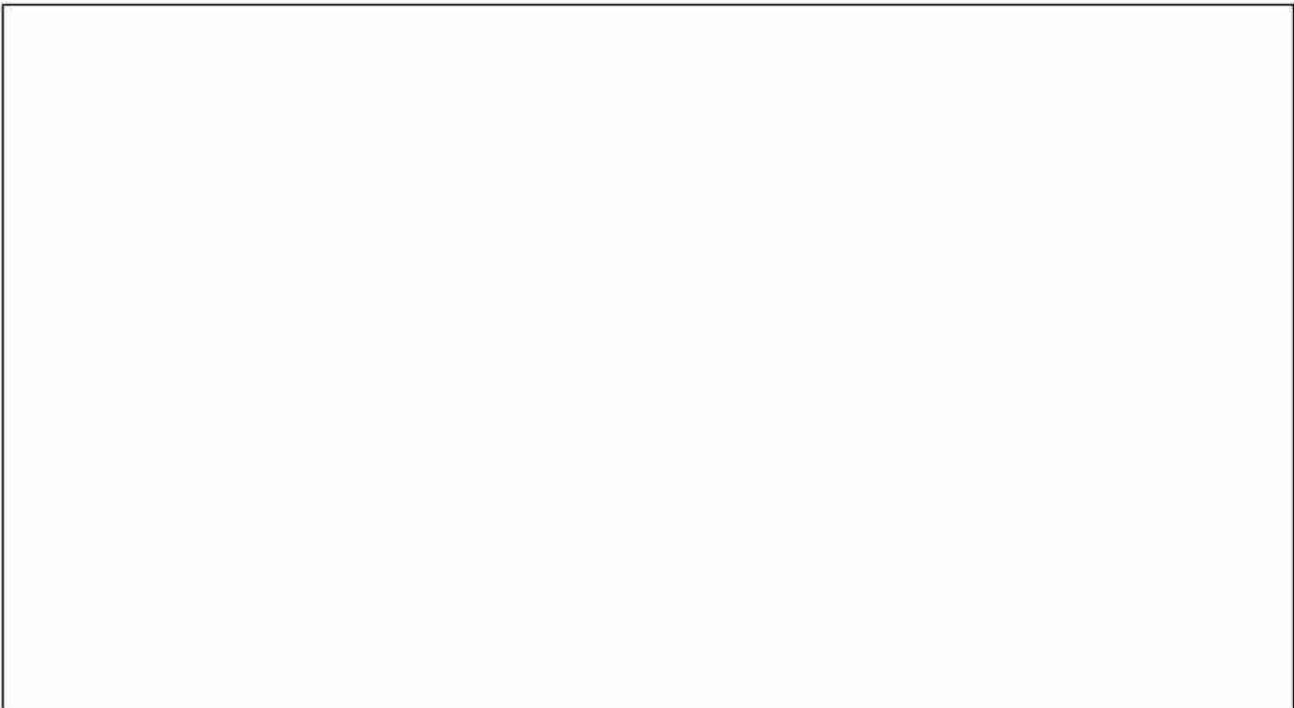
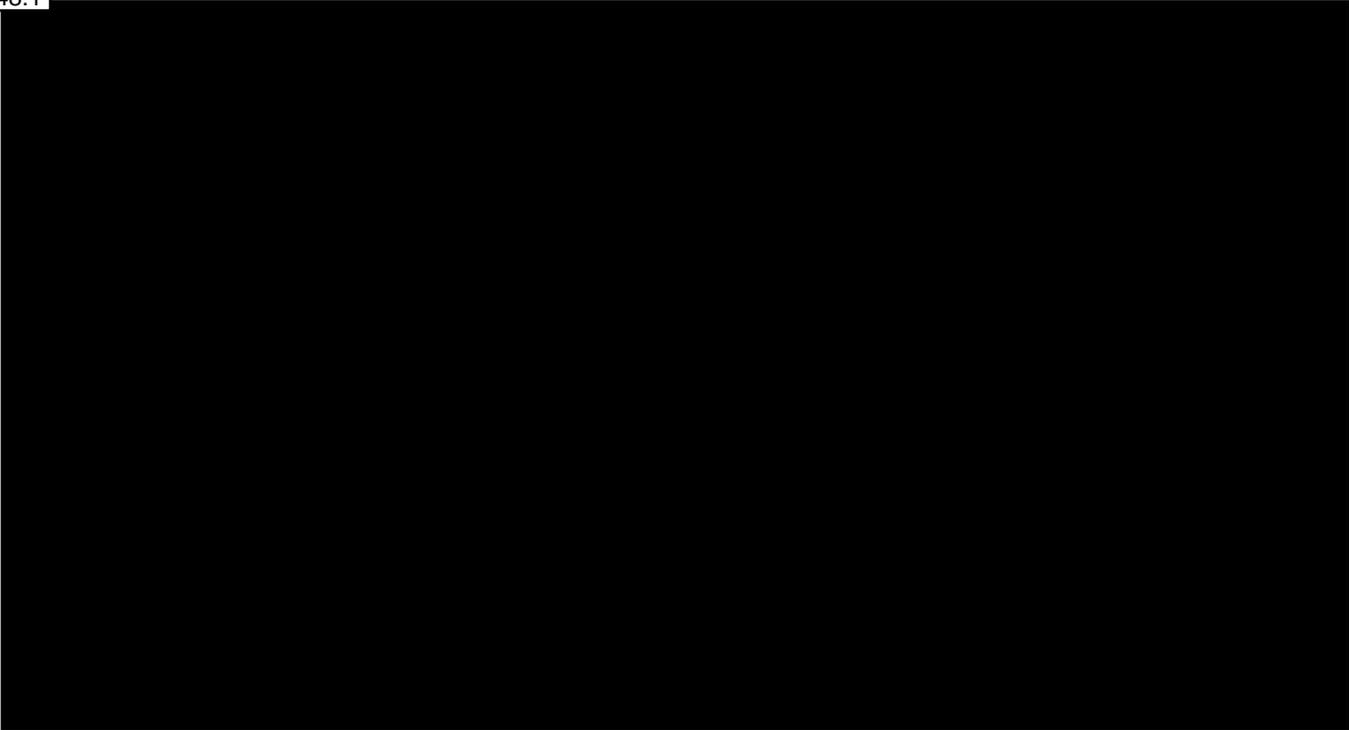
Some people with chronic hepatitis C may decide against having treatment. There can be several reasons for this; for example, they might not have any symptoms currently, they may be willing to live with the risk of cirrhosis at a later date, or they might not feel that the potential benefits of treatment outweigh the side effects.

14. Case Scenarios

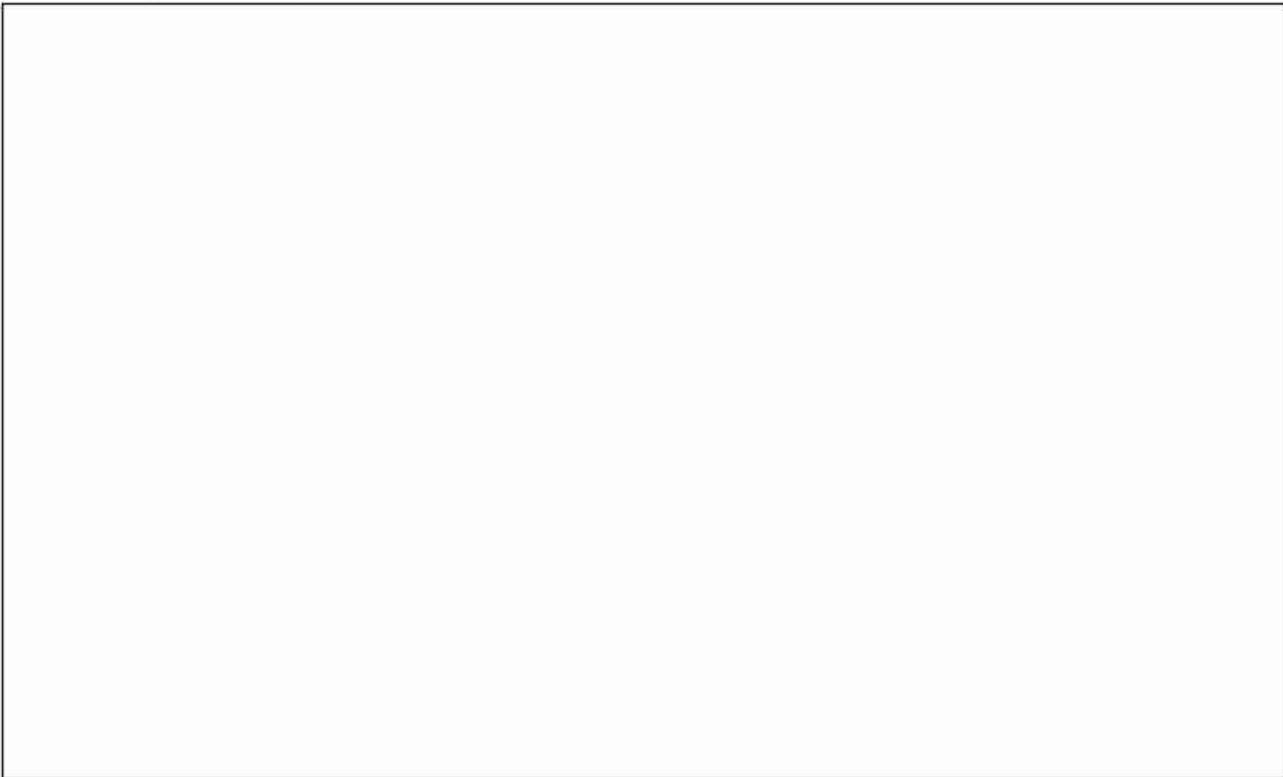
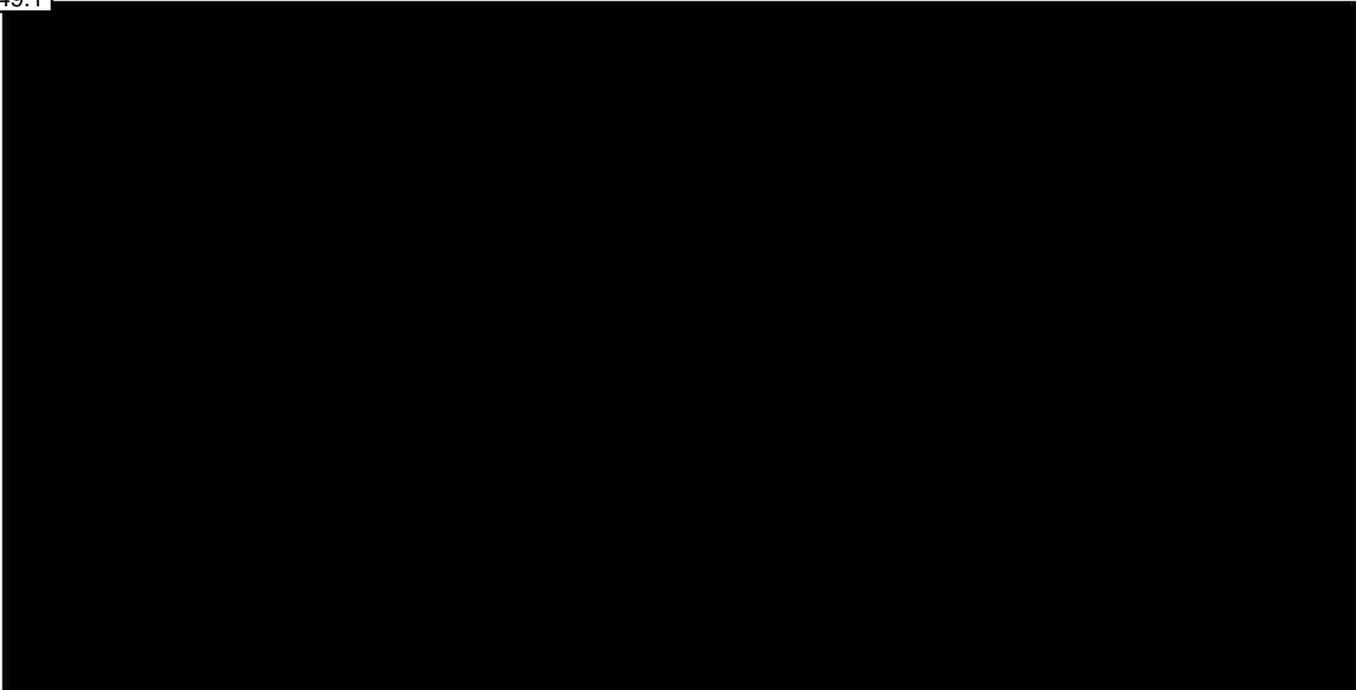
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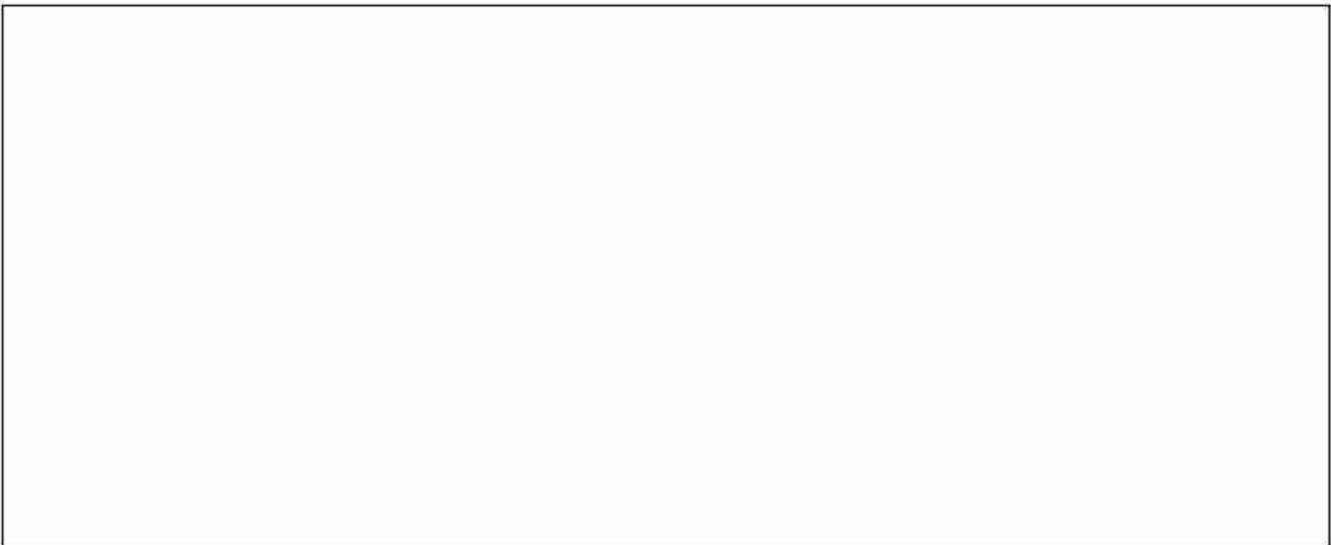
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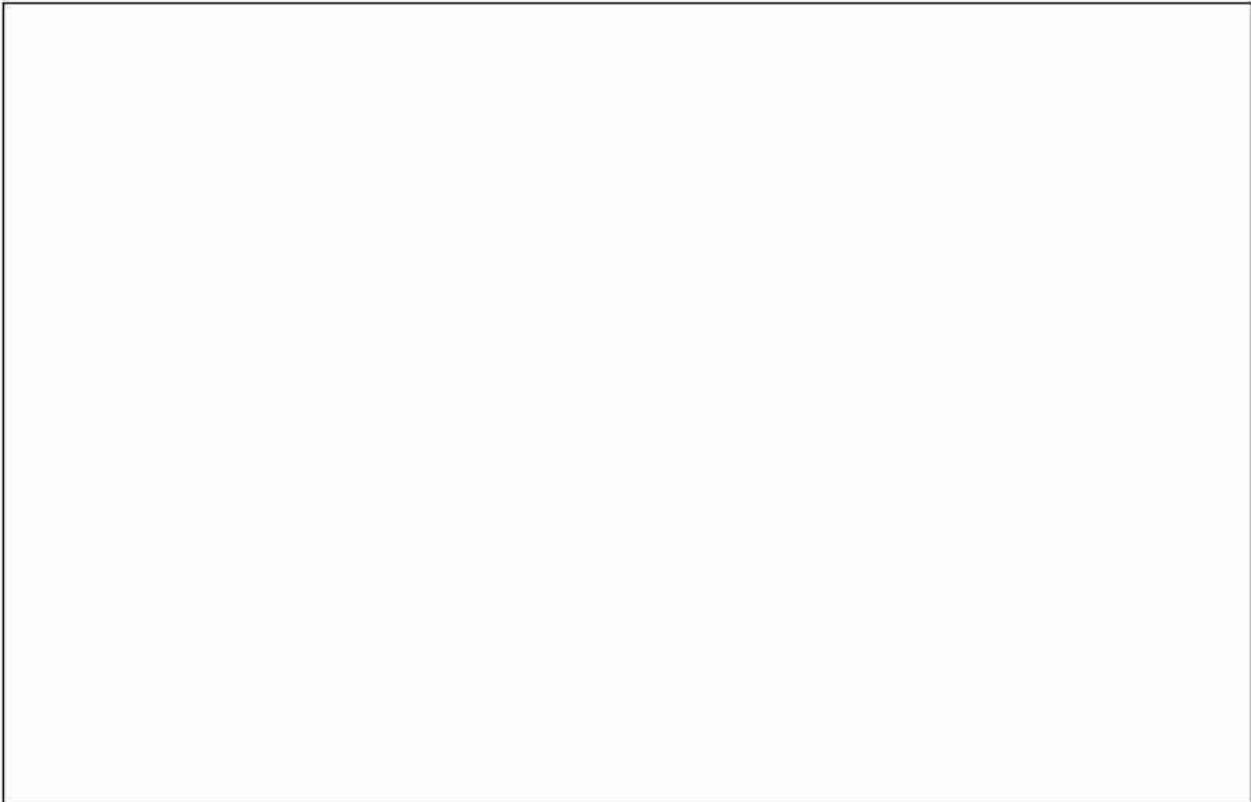
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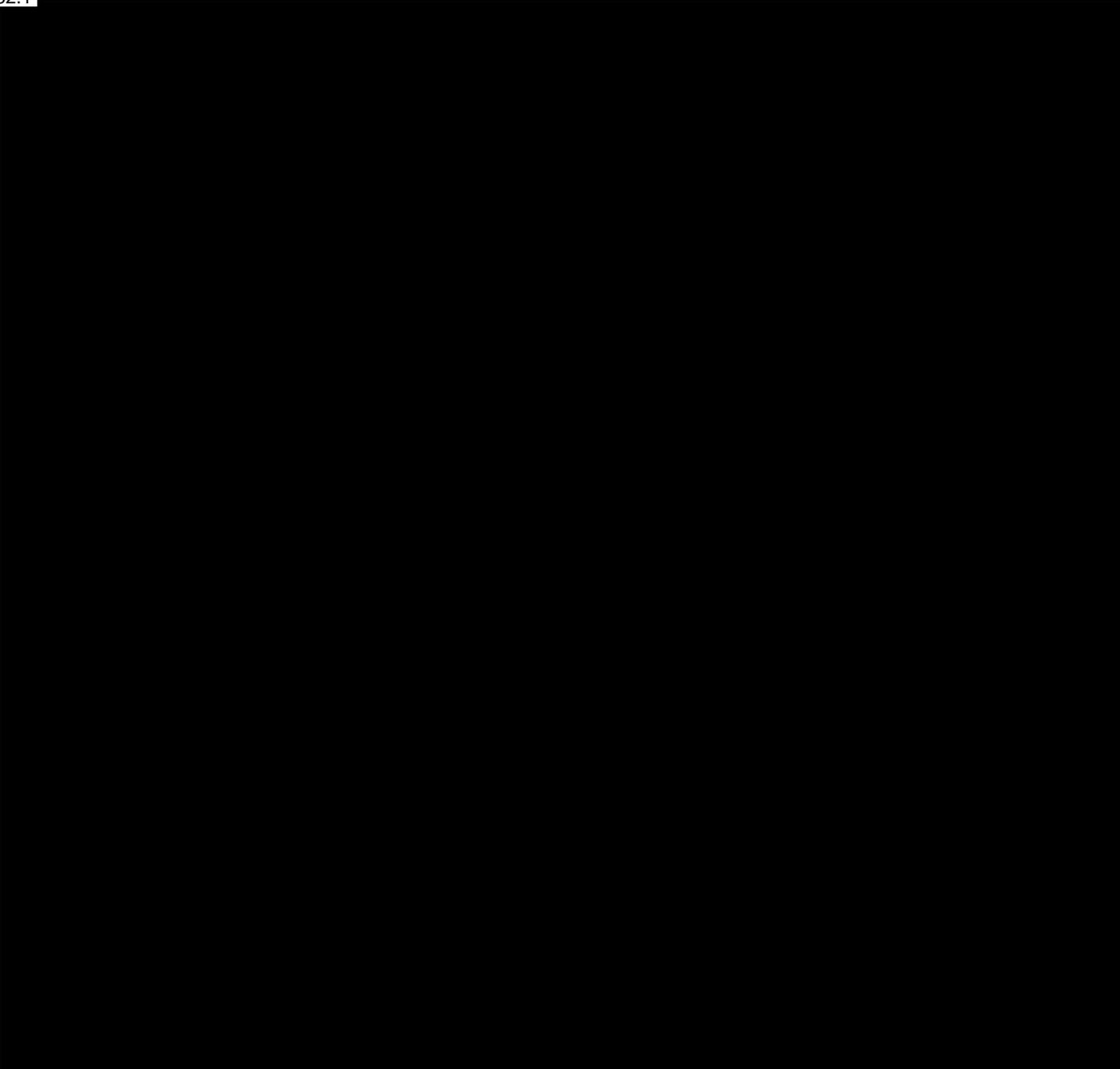
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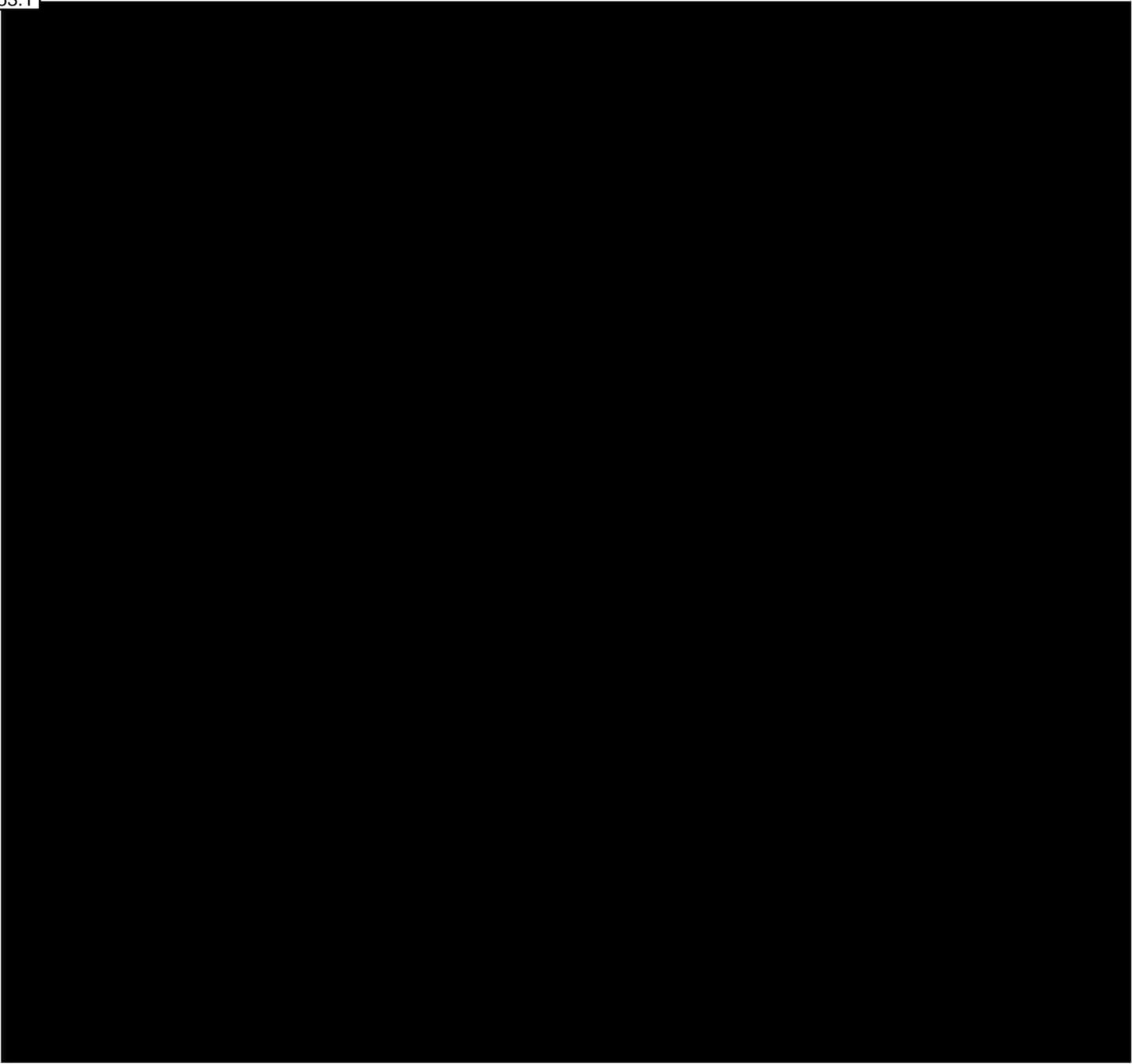
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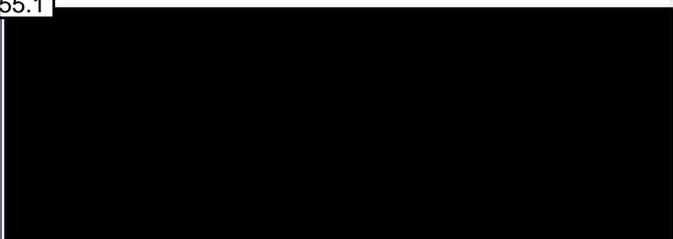
Suggested Resources

BNF – British National Formulary - <https://bnf.nice.org.uk/drug/> for up to date medication information.

NICE - The National Institute for Health and Care Excellence which provides national guidance and advice on the management of many medical conditions – <http://www.nice.org.uk/guidance>

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