TREATMENT, PROPHYLAXIS AND PREVENTION OF OPPORTUNISTIC AND OTHER INFECTIONS IN ADULTS LIVING WITH HIV

All doses stated assume treatment is for non pregnant adults with normal renal and liver function.
Any potential interactions with HIV medicines can be checked at www.hiv-druginteractions.org or discussed with HIV Pharmacist
Primary care may be requested to prescribe medicines for prophylaxis or maintenance. Unless otherwise requested in hospital discharge or clinic, letters monitoring is undertaken by secondary care.

Infections covered by this guidance:

Infections covered in other guidance: Influenza COVID Bacterial Pneumonia Aspergillosis STIs

Vaccination guidance: Measles Shingles Monkeypox Other vaccines

For guidance on samples to be taken for each infection refer to the lab handbook (available on ICE requesting system) or discuss with Microbiology

INFECTION	TREATMENT			FURTHER INFORMATION	PROPHYLAXIS	LICENCE/ AVAILABILITY
	SEVERITY	1ST LINE	2ND LINE			
PNEUMOCYSTIS PNEUMONIA (PJP/PCP) *(Pneumocystis jiroveci)*	**Mild to Moderate** PaO_2 >9.3kpa on room air	**Co-trimoxazole** oral 1920mg TDS or 90mg/kg/day in 3 divided doses (rounded to nearest 480mg) Dosing in obesity: Use adjusted bodyweight to calculate dose. Total Duration: 21 days	*Option1:* **Clindamycin** oral 600mg tds + **Primaquine*** oral 30mg OD *Option2:* **Dapsone*** 100mg oral daily + **Trimethoprim** oral 20mg/kg/day in 3 divided doses rounded to nearest 50mg *Option3:* **Atovaquone** oral 750mg BD, with food (preferably high fat) Total Duration: 21 days	Patients who develop PCP despite taking co-trimoxazole as prophylaxis can be treated first line with standard high dose co-trimoxazole. It is recommended to wait at least 4 days before switching therapy in the absence of clinical improvement. *Check G6PD prior to prescribing dapsone or primaquine but do not delay treatment. Atovaquone has poor bioavailability. Presence of food (particularly high fat) increases the absorption 2-3 fold. Antiretrovirals should be started when possible, within 2 weeks of diagnosis of PCP.	*Secondary prophylaxis:* Started immediately after completing PCP treatment *Primary prophylaxis:* For all patients with CD4 count ≤200 or CD4% <14. **Co-trimoxazole** 480mg OD or **Dapsone*** 100mg OD or **Atovaquone** 1500mg OD with food (preferably high fat meal) Discontinue primary and secondary prophylaxis: • After starting antiretroviral treatment and CD4 count increased to ≥200 for ≥3months • After starting antiretroviral treatment and CD4 count between 100-200 and HIV viral load <50copies/mL for ≥3 months Restart primary or secondary prophylaxis: • CD4 decreases to <100 irrespective of viral load • CD4 100-200 and detectable viral load	Primaquine is not licensed in the UK but can be prescribed on a named patient basis – contact pharmacist to order. Atovaquone is only available as a liquid. Use of clindamycin and trimethoprim are off label for treatment of PCP. Use of atovaquone and dapsone are off label for prophylaxis of PCP.
	Severe PaO_2 ≤9.3kpa on room air or ≤92% at rest of falling by ≥3% on exercise	**Co-trimoxazole** IV infusion 120mg/kg/day for 3 days then reduce to 90mg/kg/day for 18 days. Daily dose divided into 3-4 doses. Dosing in obesity: Use adjusted bodyweight to calculate dose. **+ steroids** (see further information box) Oral co-trimoxazole has very good bioavailability. Review IV daily and switch to oral co-trimoxazole at same dose when appropriate after clinical improvement to complete course. Total Duration IV/PO: 21 days	*Option1:* **Clindamycin** IV infusion 600 QDS or 900mg TDS + **Primaquine*** oral 30mg OD *Option2:* ****Pentamidine isetionate** IV infusion 4mg/kg OD in 250ml 5% glucose over at least 60 mins. ◆Reduce dose to 3mg/kg od if toxicity Caution: hypotension, hypoglycaemia Total Duration: 21 days	**In severe disease:** Start steroids as soon as possible and within 72 hours of starting anti PCP treatment for maximal benefit. **Prednisolone** oral: 40mg bd days 1-5 40mg od days 6-10 20mg od days 11-21 then stop. If IV required use methylprednisolone at 75% of oral prednisolone dose Pneumothorax is a common complication of severe disease and carries a poor prognosis. CXR required if deterioration and/or chest pain.		**Pentamidine IV should be made in Pharmacy Aseptic Unit ◆dose in CDC guidance

INFECTION	TREATMENT		FURTHER INFORMATION	PROPHYLAXIS	LICENCE / AVAILABILITY
	1ST LINE	2ND LINE			
CRYPTOCOCCAL MENINGITIS *(Cryptococcus neoformans)*	**INDUCTION THERAPY:** **Liposomal Amphoteracin B** IV infusion (Ambisome) 10mg/kg day 1 only + ***Flucytosine** PO 25mg/kg four times daily + **Fluconazole** PO 1200mg daily **OR** **Liposomal Amphoteracin B** IV infusion (Ambisome) 4mg/kg daily + ***Flucytosine** PO 25mg/kg four times daily (if not available or oral route not suitable use IV/PO Fluconazole 800mg OD) Duration: 14 days (refer to further information re extended duration) **MAINTENANCE THERAPY:** *Then step down to:* **Fluconazole** PO 800mg OD (400mg OD for clinically stable patients with negative CSF cultures) for 8 weeks *Then:* Chronic maintenance therapy for 1 year of Fluconazole 200mg OD	For patients who cannot tolerate or are unresponsive to amphoteracin consider using: **INDUCTION THERAPY:** **Fluconazole** PO/IV infusion 800 - 1200mg OD + ***Flucytosine** PO 25mg/kg four times daily Duration: 14 days or until negative CSP culture on repeat LP **MAINTENANCE THERAPY:** *Then step down to:* **Fluconazole** PO 400-800mg OD for 8 weeks *Then:* Chronic maintenance therapy for 1 year of Fluconazole 200mg OD	A test dose of Ambisome should be given at start of course – 1mg over 10 mins then stop infusion and observe patient for 30 minutes. Continue infusion if no anaphylactoid/allergic reactions. Ambisome should be prescribed by brand name. CSF manometry should be performed on all patients at baseline or if any signs of neurological deterioration occur. Serial lumbar punctures or neurosurgical procedures are indicated for individuals with an opening pressure >250mmH_2O. Corticosteroids, mannitol and acetazolamide have not been shown to be of any benefit. 1st line combination therapy has more rapid CSF sterilisation and decreased incidence of relapse. Monitor U&Es, Mg, LFTs, FBC daily. Adjust flucytosine dose for renal impairment. Monitor flucytosine levels within first 48-72 hours. Aim for pre dose 20-50mg/L and 2 hour post dose 50-100mg/L (as per Bristol Reference lab guidance). Repeat levels after any changes in renal function or doses. For azole anti-fungals consider interactions with other medicines. Consider extending induction duration until negative CSF culture on repeat LP for patients with poor prognosis at baseline or a poor initial clinical response to induction therapy.	**Primary prophylaxis:** not indicated **Secondary prophylaxis:** **Fluconazole** PO 200mg OD if CD4 drops <100 Other options for prophylaxis: **Ambisome** 4mg/kg/weekly **Itraconazole** is inferior to fluconazole and should not be used Discontinue prophylaxis when: • CD4 count is >100 for ≥3 months AND • viral load undetectable ≥3 months AND • completed 1 year of chronic maintenance therapy	*Oral flucytosine is not licensed in the UK but can be prescribed on a named patient basis – contact pharmacist to order. Supply of UL stock can be difficult to obtain. IV flucytosine is no longer available in the UK.
PULMONARY CRYPTOCOCCOSIS *(Cryptococcus neoformans)*	As per cryptococcal meningitis	As per cryptococcal meningitis	If CSF exam is negative and • there is no other evidence of dissemination and • radiological infiltrates are focal and • there is no hypoxia **Fluconazole** PO 400mg OD for 10 weeks then 200mg OD for 6 months is an alternative strategy.	As per cryptococcal meningitis	

INFECTION	TREATMENT		FURTHER INFORMATION	PROPHYLAXIS	LICENCE / AVAILABILITY
	1ST LINE	2ND LINE			
CEREBRAL TOXOPLASMOSIS *(Toxoplasma gondii)*	**Sulfadiazine** PO <60kg 1g QDS >60kg 1.5g QDS + **Pyrimethamine** PO 200mg once off then <60kg 50mg OD ≥60kg 75mg OD + **Folinic Acid** PO 15mg OD (can be increased up to 45mg OD) **See note in further information box re steroids.** Duration: minimum 6 weeks *Then step down to:* Maintenance Therapy: **Sulfadiazine** PO 500mg QDS or 1g BD + **Pyrimethamine** PO 25mg OD + **Folinic Acid** PO 15mg OD (additional PCP prophylaxis not required) Maintenance therapy can be discontinued when CD4 >200 for 6 months and VL undetectable.	**Clindamycin** PO/IV infusion 600mg QDS + **Pyrimethamine** PO 200mg once off then <60kg 50mg OD ≥60kg 75mg OD + **Folinic Acid** PO 15mg OD (can be increased up to 45mg OD) OR **Co-trimoxazole** IV/PO 30mg/kg bd **See note in further information box re steroids.** Duration: minimum 6 weeks *Then step down to:* Maintenance Therapy: **Clindamycin** PO 600mg TDS + **Pyrimethamine** PO 25mg OD + **Folinic Acid** PO 15mg OD (additional PCP prophylaxis is required) OR **Co-trimoxazole** PO 960mg bd Maintenance therapy can be discontinued when CD4 >200 for 6 months and VL undetectable.	If need IV therapy use 2nd line option. IV sulfadiazine is no longer available. With sulfadiazine a fluid output of >1200ml/day should be maintained to prevent crystalluria. If this does occur stop treatment and alkalise urine using bicarbonate. Lack of response to 2 weeks of treatment, clinical deterioration of features that are not typical should lead to consideration of a brain biopsy. Sulfadiazine and clindamycin have good bioavailability so the oral route is preferred. Corticosteroids should ***NOT be used routinely*** as they cloud the diagnostic therapeutic trial. They are ONLY indicated in patients with symptoms and signs of raised intracranial pressure such as headache, vomiting, drowsiness and papilloedema. When indicated dexamethasone 4mg QDS, gradually reducing, is the treatment of choice. (Ref: BHIVA Guidelines 2011)	*Primary prophylaxis:* all patients with CD4 <200 and positive toxoplasma serology. **Co-trimoxazole** PO 480mg OD (also covers PCP) or **Dapsone** PO 50mg OD (or 200mg/week) (also covers PCP) + **Pyrimethamine** PO 50mg weekly + **Folinic acid** PO 15mg OD Or **Atovaquone** 1500mg OD (off label) Primary prophylaxis can be discontinued when CD4 count >200 for 3months and VL undetectable. *Secondary prophylaxis:* See maintenance therapy	IV sulfadiazine – no longer available. Alternative name for folinic acid is calcium folinate (Pharmacy Ascribe Code TAY015C). Oral sulfadiazine is available in the NW night emergency drug cupboard.

INFECTION	TREATMENT		FURTHER INFORMATION	PROPHYLAXIS	LICENCE / AVAILABILITY
	INDUCTION	MAINTENANCE			
CMV RETINITIS (Cytomegalovirus)	*Option 1 if immediate sight threatening lesions*: **Ganciclovir** IV infusion 5mg/kg bd for 14-21 days *Alternative Option 1 if small peripheral retinal lesions:* **Valganciclovir** PO 900mg bd for 21 days with food *Option 2:* **Foscarnet** IV infusion 90mg/kg bd for 14-21 days *Option 3*: **Cidofovir** IV infusion 5mg/kg weekly for 2 weeks	*Option1:* **Valganciclovir** PO 900mg OD with food *Option 2:* **Ganciclovir** IV infusion 5mg/kg od 5 days a week *Option 3:* **Foscarnet** IV infusion 60mg/kg od then increase if tolerated to 90-120mg/kg od (Ref: BNF/BHIVA) *Option 4:* **Cidofovir** IV infusion 5mg/kg given fortnightly Maintenance therapy can be stopped when lesions are inactive and CD4>100 and VL undetectable for >3 months. Ophthalmology checks every 3 months until immune system recovery then annually.	Monitor FBC, U&Es, LFTs for all anti-CMV medications. Valganciclovir should be taken with food. Valganciclovir/ganciclovir are considered potential teratogens and carcinogens in humans. Avoid direct contact of broken or crushed tablets, infusion powder or solution with skin or mucous membranes. If such contact occurs, wash thoroughly with soap and water or rinse eyes thoroughly with sterile water, or plain water if sterile water is unavailable. Foscarnet should be administered via a central line or must be diluted in pharmacy aseptic department to be given peripherally. Slower infusion rates may reduce rates of electrolyte disturbances. Patients should be encouraged to maintain a high level of hygiene to avoid genital ulceration. Cidofovir requires to be administered with IV hydration and probenecid tablets. See guidance for details. Note: Patients allergic to sulfa-containing medicines should not be given probenecid.	*Primary prophylaxis:* not indicated *Secondary prophylaxis:* See maintenance therapy	Ganciclovir infusions should ideally be made in pharmacy aseptic department. Foscarnet and Cidofovir are not routinely kept as stock and will require to be ordered in.
CMV COLITIS/ CMV OESOPHAGITIS	*Option 1:* **Ganciclovir** IV infusion 5mg/kg bd for 3-6 weeks or until symptoms resolved *Option 2 in cases of ganciclovir toxicity or resistance :* **Foscarnet** IV infusion 90mg/kg bd for 14 days *Option 3 in cases of intolerance or resistance to other drugs* : **Cidofovir** IV infusion 5mg/kg weekly for 2 weeks	Not routinely recommended for CMV colitis unless patient relapses after induction therapy ceases or concomitant ophthalmological disease – oral vanganciclovir 900mg od Not routinely recommended for CMV oesophagitis unless concomitant ophthalmological disease	See above for information on ganciclovr and foscarnet. **Valganciclovir** may be considered as a treatment option for all or part of the treatment course if symptoms are not severe enough to interfere with swallowing and oral absorption. For mild case, if ART can be initiated without delay, consider withholding CMV therapy.	*Secondary prophylaxis:* See maintenance therapy Prophylaxis can be stopped when patient is on antiretroviral treatment and CD4 count >100 for >6 months	Foscarnet and valganciclovir are not licensed for this indication.
CMV PNEUMONITIS	Refer to BHIVA guidelines on clinical management of pulmonary opportunistic infections section 10				

INFECTION	TREATMENT		FURTHER INFORMATION	PROPHYLAXIS	LICENCE / AVAILABILITY
	1ST LINE	2ND LINE			
OROPHARYNGEAL CANDIDIASIS	**Fluconazole** PO 100mg OD for 7-14 days In severe disease: up to 200mg OD	**Itraconazole** liquid PO 200mg BD (20ml) for 7-14 days	For all azole antifungals check for interactions with other medications. Itraconazole liquid has increased oral bioavailability and it may also have some local effect so is the preferred formulation. The liquid should be taken 1 hour before food or on an empty stomach. The dose should be swished around the mouth and swallowed without rinsing. **CSM warning: itraconazole** is contra-indicated in patients with evidence of or history of congestive heart failure	*Primary prophylaxis:* not recommended - promotes resistance. *Secondary prophylaxis*: not recommended - promotes resistance.	
OESOPHAGEAL CANDIDIASIS	**Fluconazole** PO 200mg OD for 14-21 days In severe disease: up to 400mg OD or 200mg BD	**Itraconazole** liquid PO 200mg BD (20ml) for up to 14 days Non-responders or resistant Candida: **Voriconazole**, **posaconazole** or caspofungin/**anidulafungin**		*Primary prophylaxis:* not recommended - promotes resistance. *Secondary prophylaxis*: not recommended - promotes resistance.	
HSV OESOPHAGITIS	**Aciclovir** IV 5-10mg/kg tds followed by valaciclovir PO 1g bd for a total of 14 days or until healing is complete	**Foscarnet** IV 40mg/kg bd or tds for aciclovir resistant HSV		*Not recommended*	
CRYPTOSPORIDOSIS *(Cryptosporidium parvum)*	Initiate or optimise HAART + Symptomatic treatment of diarrhoea + Adequate hydration	CONSIDER **Nitazoxanide** PO 500mg BD for 3 days (can be extended up to 12 weeks) + all elements of 1st line therapy	Nitazoxanide efficacy is limited in severely immunocompromised patients.	Primary prophylaxis: not indicated	Nitazoxanide is not licensed in the UK. Available on a named patient basis. Contact Pharmacist to order.
MICROSPORIDOSIS (Intestinal infection)	Initiate or optimise HAART + Symptomatic treatment of diarrhoea + Adequate hydration	Consider **Albendazole** PO 400mg BD for 14 days in addition to all elements of 1st line therapy in *E. intestinalis* infection	Albendazole has poor oral bioavailability so should be taken with fatty food to maximise absorption. Check for drug interactions.	Primary prophylaxis: not indicated	Albendazole is not licensed in the UK. Available on a named patient basis. Contact Pharmacist to order.
OTHER GI INFECTIONS	Refer to BHIVA guidelines on the clinical management of gastrointestinal opportunistic infections or NHS Tayside guidelines for treatment of parasites				

INFECTION	TREATMENT		FURTHER INFORMATION	PROPHYLAXIS	LICENCE / AVAILABILITY
	1st LINE	2nd LINE			
Disseminated MYCOBACTERIUM AVIUM COMPLEX (DMAC)	***Clarithromycin** PO 500mg BD (or ***Azithromycin** 500mg OD) + **Ethambutol** PO 15mg/kg (rounded to nearest 100mg) + **Rifampicin** or **Rifabutin** (see further information)	For treatment failure options include: **Rifabutin** – if not used 1st line **Ethambutol** – can be continued as it facilitates the penetration of other agents in mycobacteria **Ciprofloxacin** **Moxifloxacin** **Levofloxacin** **Amikacin** IV **Linezolid**	See NHS Tayside NTM Pulmonary Infection Guidance for dosing and monitoring Treatment can be stopped after 12 months if clinical improvement, culture conversion and, CD4 >100 + viral load undetectable for at least 6 months. .	Primary prophylaxis: Consider if CD4 <50 and antiretrovirals cannot be started within 2 weeks ***Azithromycin** PO 1250mg weekly or *Clarithromycin 500mg bd Follow food /antacid administration instructions for formulation dispensed. Prophylaxis can be stopped if CD4 >100 for at least 3 months.	Unlicensed indication for clarithromycin, azithromycin, ciprofloxacin, amikacin, linezolid Rifabutin, Cycloserine and prothionamide are not routinely kept as stock and will require to be ordered. *Macrolides consider interactions and prolonged QT interval.
LATENT TUBERCULOSIS and ACTIVE TB INFECTION	Refer to BHIVA guidelines on clinical management of Tuberculosis				

Adapted from: BHIVA Guidelines, EACS 2023, IDSA 2020
Global guideline for the diagnosis and management of cryptococcosis 2024
Prepared by: K Hill, HIV/Antimicrobial Pharmacist
Reviewed by: HIV Team
Approved by: AMG April 2024
Review: April 2027