HIV Service Algorithms

Screening and Management of HIV related Co-Morbidities

- Vaccinations
- Cholesterol
- Hypertension
- Diabetes
- Kidney Injury
- Liver Health
- Bone Health
- STI Management
- Neurocognitive Impairment

Prepared by Sarah Whiting, Janine Trevillyan, Jennifer Hoy

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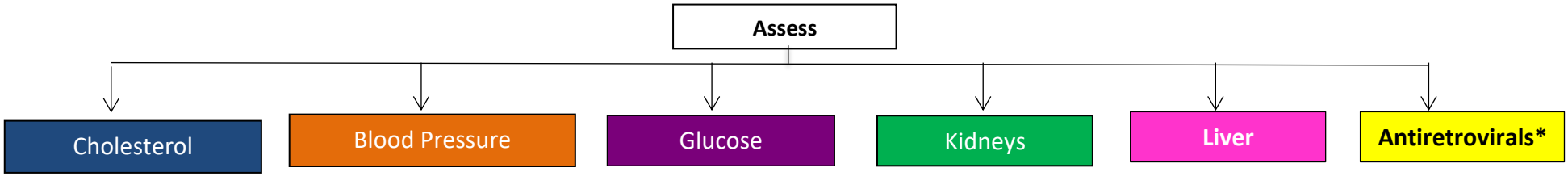
Vaccination Recommendations in HIV Positive Adults at Alfred Health

VACCINE	RECOMMENDATION
Influenza	Annual
Diphtheria, tetanus, pertussis	According to routine recommendations
Varicella	2 doses if CD4 cells >200 and non-immune. Not recommended if CD4 <200 (MMRV not recommended)
Measles Mumps Rubella	2 doses if CD4 cells >200 and non-immune. Not recommended if CD4 <200 (MMRV not recommended)
HPV	9vHPV registered and recommended for females up to 45 years and males up to 26 years 3 doses (0, 1, 6 months)
Pneumococcal conjugate 13 (PCV13)	1 dose all. If never received PPV23 then PPV23 should be given a minimum of 8 weeks after the PCV13. If previously received one or more doses of PPV23 then PCV13 should be given at least 12 months after the most recent dose of PPV23
Pneumococcal Polysaccharide 23 (PPV23)	1 dose 8 weeks after PCV13 (if they have never received a previous PPV23 dose) If a previous PPV23 dose given, then second dose of PPV23 is recommended 5-10 years after the last PPV23 dose (up to maximum of 3 doses during person's adult life)
Zoster	1 dose if CD4 cells >350 (when there is a strong indication to vaccinate it may be considered if CD4 200-350). Not recommended if CD4 <200. Serological confirmation of previous VZV infection recommended prior to vaccination.
Haemophilus influenzae	According to routine recommendations
Meningococcal B	2 doses for person at risk
Meningococcal ACWY	2 doses (at least 8 weeks apart)
Hepatitis B	3 doses (0, 1, and 6 months) 40mcg Check HBsAb 4-8 weeks after last dose, if <10 IU/ml, repeat 3 doses at 40mcg If CD4 cells <200 consider deferring till CD4 count >200 and viral load undetectable
Hepatitis A	2 doses recommended (0, 6-12 months). Three doses if CD4 <350 Can be used in combination with HBV (Twinrix) if CD4 >500 or consider with additional 20mcg dose hepatitis B (so total Hepatitis B dose is 40 mcg) if CD4 count <500

Reducing Cardiovascular Risk in People Living with HIV

Lifestyle Advice – Should be highlighted in ALL patients	
Dietary Counselling	- Include vegetables (5 serves), whole grains (4-5 serves) and fruit (2 serves) in the diet every day - Aim for 2-3 serves of fish per week - Choose healthier fats and oil: choose lean meat, skinless poultry & low fat dairy; consider a handful of nuts or ¼ avocado each day - Ensure portions aren't too large, limit sugary, fatty & salty meals and snacks
Exercise	- Encourage regular moderate-intensity exercise (take the stairs, walk to work, swimming etc.) rather than vigorous exercise - Aim for at least 30 minutes of exercise per day
Lifestyle	- Smoking cessation advice, consider referral to smoking cessation clinic - Limit alcohol to no more than standard 2 drinks/day



Consider ART modifications if 5 year CVD risk greater than 10% and treatment history and HIV resistance patterns allows:

- Replace older NRTIs or abacavir with TAF, continue with lamivudine or emtricitabine
- Replace older PIs or darunavir with atazanavir or INSTI (integrase inhibitor)
- Cobicistat has more favourable lipid profile than ritonavir

Prepared by Sarah Whiting, Jennifer Hoy

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Hypercholesterolemia in HIV

Who to Screen	**ALL** HIV positive patients
Frequency	Annually, immediately prior to starting ART and 6/12 post any change in ART
How to screen	**FASTING** blood test for total cholesterol, LDL-C, HDL-C, triglycerides

LIPID TARGETS ON THERAPY	
Total Cholesterol (TC)	<4.0 mmol/L
High Density Lipoprotein (HDL-C)	≥1.0 mmol/L
Low Density Lipoprotein (LDL-C)	<2.0 mmol/L
Triglycerides (TG)	<2.0 mmol/L
Non HDL cholesterol (non HDL- C)	<2.5mmol/L

Stop statin if:
ALT > 3x ULN
Creatinine Kinase (CK) > 1000 U/L
CK > 500 U/L plus myalgia
Continue statin if only mild muscle symptoms and CK < 500 U/L
Consider rechallenge after 4 weeks at lower dose if reaction mild

Daily Drug Doses

Agent	Starting dose	Max. dose		Comments
		Non-PI/cobicistat ART	PI/cobicistat ART	
Atorvastatin	10mg	80mg	40mg	Check for antibiotic (e.g. clarithromycin, fusidic acid), antifungal and other drug interactions prior to commencing
Rosuvastatin	5mg	40mg	20mg	
Pravastatin	20mg	80mg	40mg	2nd line (lower potency)
Simvastatin	**NOT** recommended for co-administration with antiretroviral therapy			
Fish Oil (with high percentage of omega 3 FA)	Eg. Omacor 3-4g	No adjustment required		
Fenofibrate	145mg	No adjustment required		Monitor ALT/CK if combination statin/fibrate, ↑ risk of side effects. Dose reduce if renal dysfunction
Ezetimibe	10mg	No adjustment required		Used in combination, or as monotherapy if statin is contraindicated

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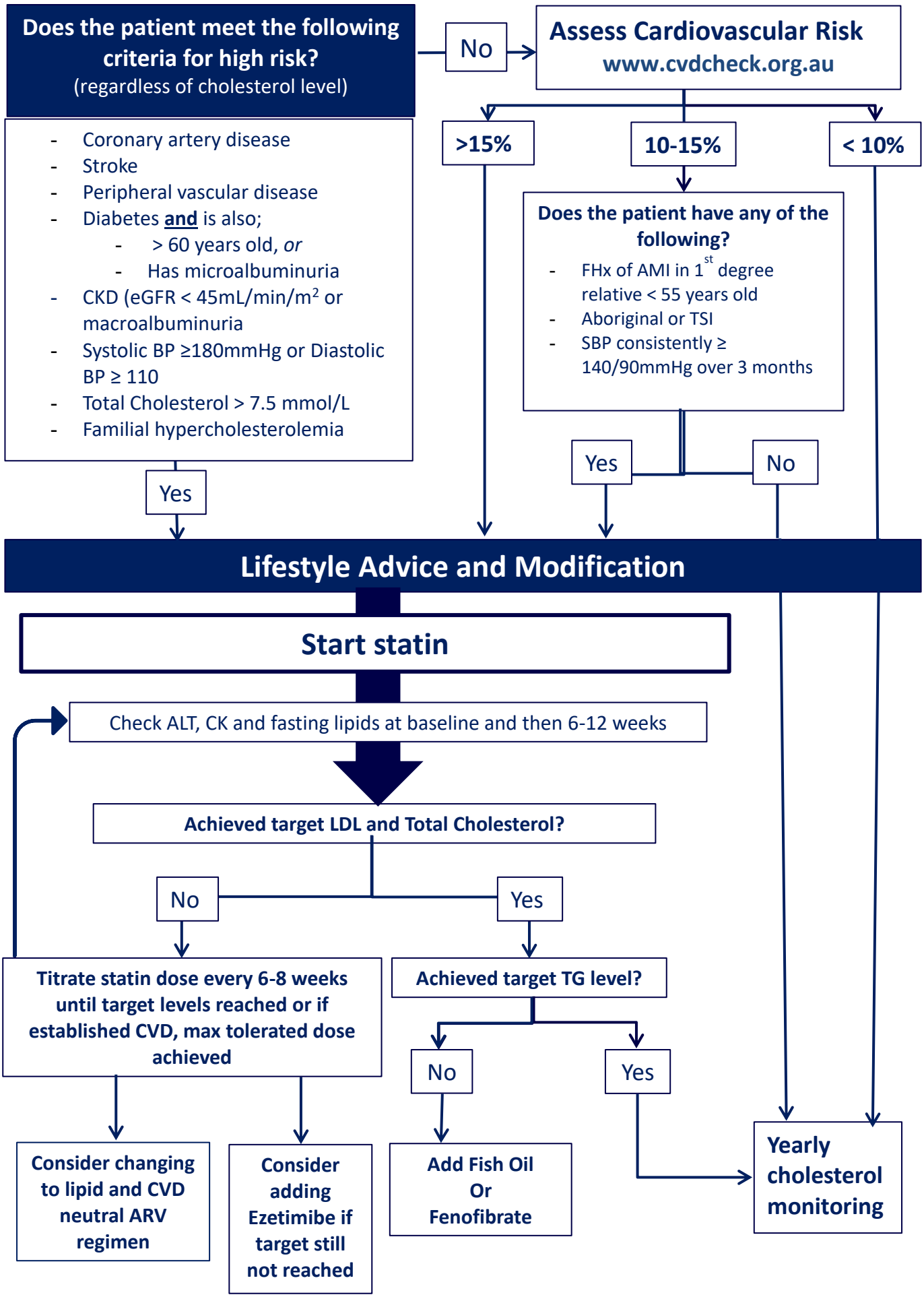

Refer to Cardiology/ HIV metabolic clinic if unable to reach targets

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Blood Pressure monitoring and management in HIV

Who to Screen	**ALL** HIV positive patients
Frequency	At each visit or at least annually
How to screen	Measure BP at rest with an appropriate sized cuff in both arms at level of heart, ongoing measurement to be done in the arm with the highest BP Measure blood pressure three times in one sitting (average last two) on at least two separate occasions to confirm reading If hypertensive confirm with 24 hourly or home BP measurement

Targets of Therapy (clinic measurements)	
Patient Group	**TARGET (mmHg)**
High risk (see overleaf) and able to tolerate	SBP <130/80
Otherwise	<140/90

Secondary Hypertension		
Causes	**When to suspect**	**How to investigate**
Primary Hyperaldosterism	Hypokalaemia (not excluded if potassium normal)	Plasma aldosterone:renin before commencing ACE Inhibitor/ ARB
Cushing's syndrome	Cushingoid or on PI with inhaled glucocorticoid	24 hour urinary free cortisol
Phaeochromocytoma	Headaches/ sweating and palpitations	24 hour urinary catecholamines and metanephrines
Polycystic kidney disease	Family history/ enlarged kidneys	Renal tract US
Reno-vascular	Young and female/ acute worsening of Cr following ACE Inhibitor	Doppler renal ultrasound
Co-arctation of aorta	Radial-femoral delay	TTE
Obstructive sleep apnoea	Obese, daytime somnolence or snorer	Sleep study
Drugs such as NSAIDs/steroids/SNRIs/recreational eg metamphetamine		

Drug	Indication for 1st line therapy	Comments	Example drug, dose range
ACE inhibitor	CKD, Diabetes, CCF	Do not combine with ARB. Avoid if pregnant.	Ramipril, 2.5mg-10mg daily
Angiotensin II Receptor Blocker (ARB)	CKD, Diabetes, CCF	Do not combine with ACE In. Avoid if pregnant.	Candesartan, 8-32mg daily
Thiazide Diuretic		Avoid if gout. Increase risk of diabetes.	Hydrochlorothiazide, 25mg daily
Calcium Channel Blockers	Angina	Do not combine verapamil with Beta blocker Caution with PI ARV therapy	Amlodipine, 2.5mg-10mg daily
Beta blockers	Not recommended first line use except if angina, post AMI or selective BB for CCF	Inferior benefit compared to first line agents. Avoid in asthma and bradycardia.	Atenolol, 25-100mg, in one or two doses

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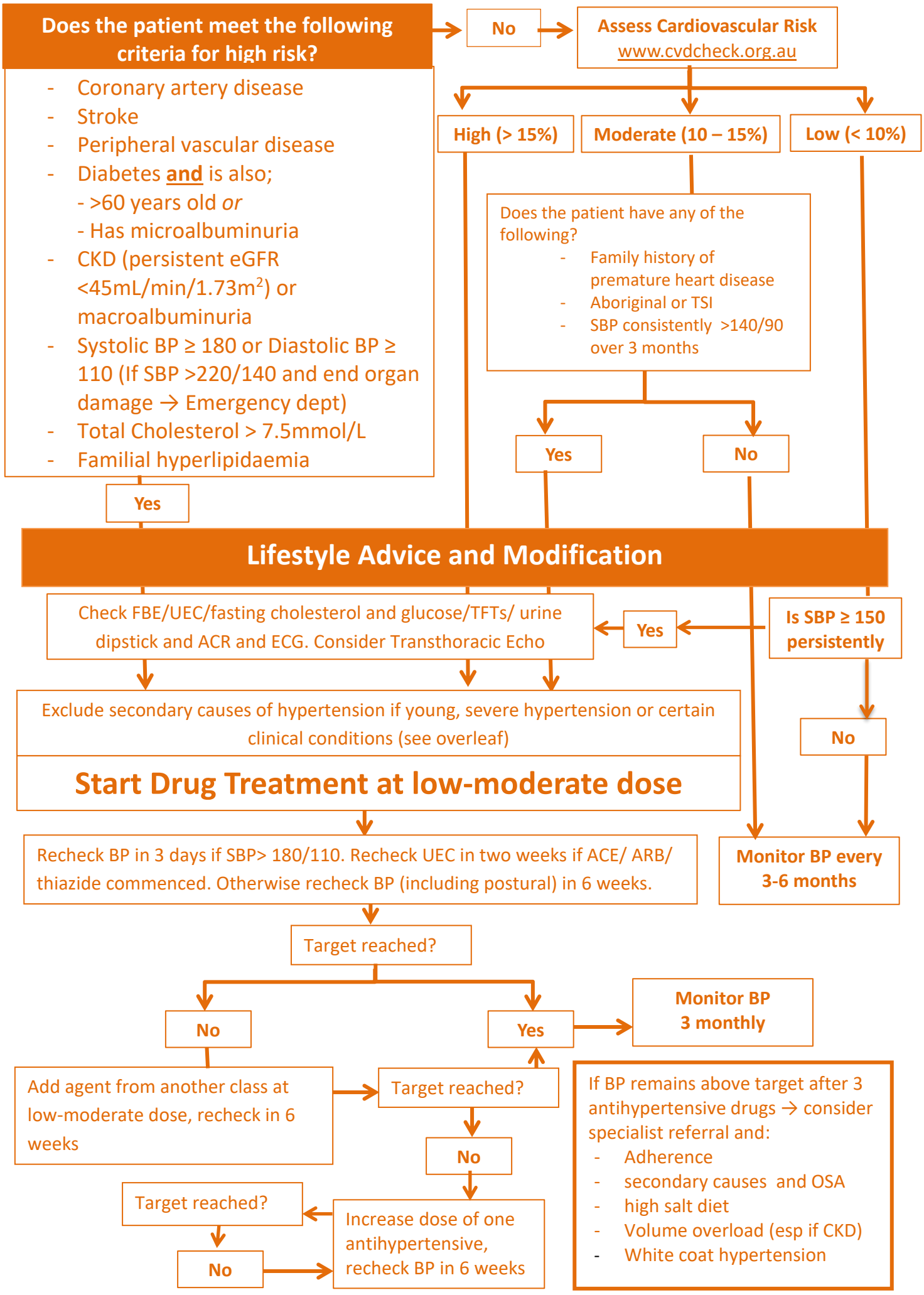

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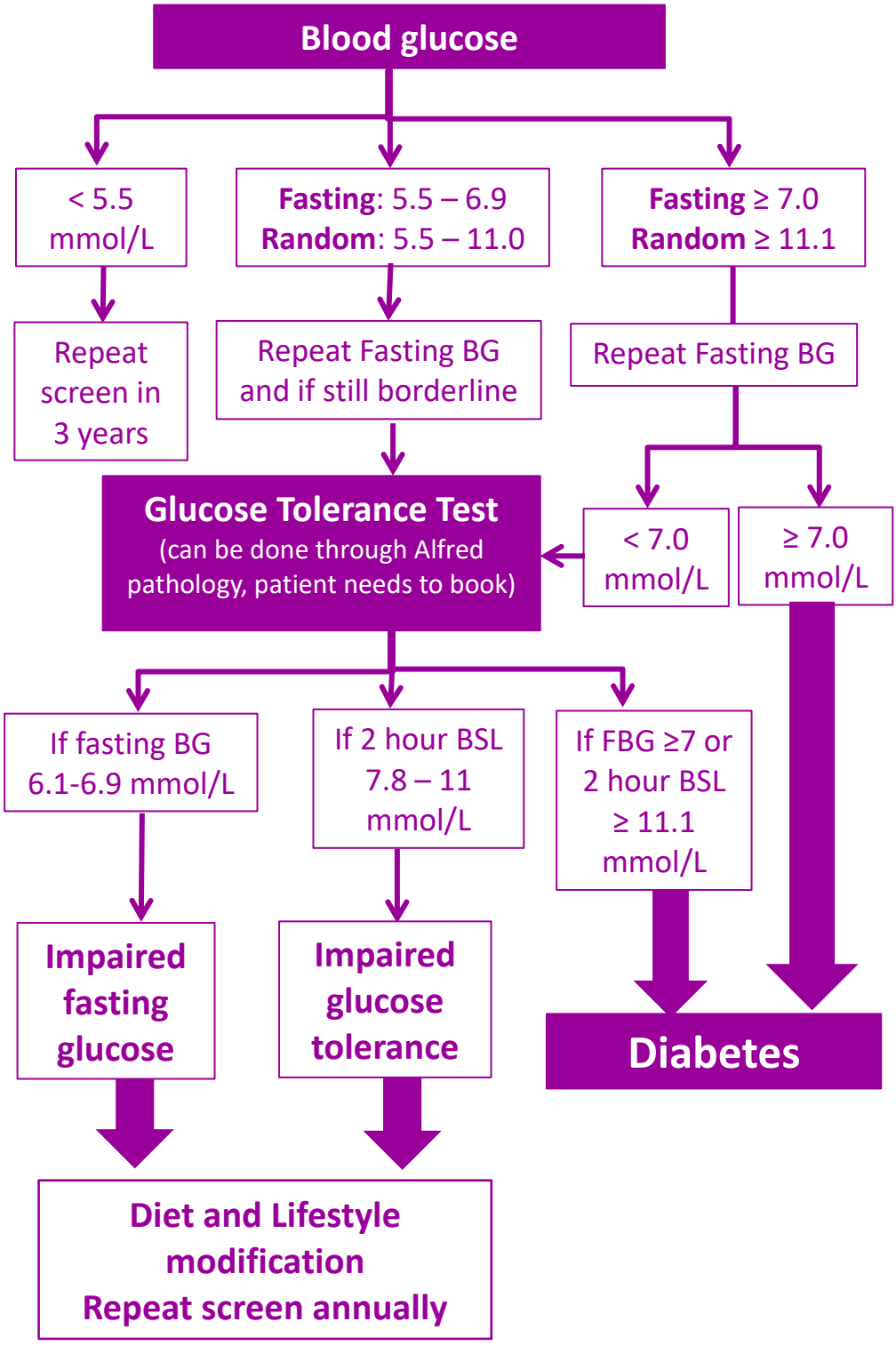
Screening and Management of Diabetes in HIV

Who to Screen	**ALL** HIV Positive Patients **> 40 years** of age **or** at **any age** if they present with one of the **risk factors** listed below
Screening Frequency	Every **3 years** or **annually** if evidence of impaired glucose tolerance or impaired fasting glucose
How to screen	**Fasting blood Glucose (FBG)** Random blood glucose **(RBG)** is a reasonable alternative if unable to obtain FBG HbA1C ≥ 6.5% on 2 separate occasions also diagnostic of diabetes (however may underestimate diabetes in HIV population)

Risk Factors for Developing type 2 Diabetes
Cardiovascular disease
Aboriginal/Torres Strait Islander ≥18 years old
Pacific Island, Indian subcontinent or Chinese origin > 35 years old
Polycystic ovary syndrome
Gestational diabetes
Antipsychotic drug therapy
Impaired fasting glucose
Impaired glucose tolerance

Impaired fasting glucose and impaired glucose tolerance
Indicator of ↑ risk of diabetes These patients are already at ↑ risk of cardiovascular disease. **Strict control of cardiovascular risk factors should be a priority** Life style change can delay or prevent progression to diabetes



Prepared by Janine Trevillyan, Jenny Hoy, Sarah Whiting, Duncan Topliss May 2018

Management Steps following a new diagnosis of type 2 Diabetes

Step 1:

Further testing to perform

- HbA1C (3 monthly)
- Urinary albumin-creatinine ratio (annually)
- Serum UEC (3 monthly if on metformin otherwise annually)
- Lipids (annually)
- FBE, LFTs and Thyroid Function Tests (annually)

Step 2:

Refer all patients to:

1. Dietician
2. Diabetes Educator (esp if on hypoglycaemic that requires BSL monitoring)
3. Ophthalmologist
4. Podiatrist if clinical evidence of peripheral neuropathy/ PVD
5. Bariatric surgical clinic if 18-65 years old, and BMI >40 (or BMI >35 and an additional obesity related co-morbidity such as OSA)

Step 3:

Calculate cardiovascular risk (www.cvdcheck.org.au) and optimise management of other risk factors (cease smoking, treat hypertension or albuminuria with ACE Inhibitor first line and treat dyslipidaemia as per guideline)

Step 4:

Trial lifestyle modification for three months and recheck HbA1c

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HbA1c < 7%

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Continue to monitor & encourage diet adherence

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HbA1c >7%

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Consider Metformin if eGFR >30
(Starting dose 500mg BD)
May worsen lipoatrophy

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Titrate not more frequently than fortnightly to maximally tolerated dose (3g)
If on dolutegravir or eGFR 30-50, increase only to 1g daily and consider ceasing if both present

Targets of Therapy	
Fasting BSL	6-8 mmol/L
HbA1C	6.5-7%

Refer to Endocrinology and consider ART modification:

- Symptomatic or severe (BSL >20) hyperglycaemia
- Hyperglycaemia despite above
- Significant complications present
- Any other concerns

Prepared by Janine Trevillyan, Jenny Hoy, Sarah Whiting, Duncan Topliss May 2018

Kidney Injury in HIV

Who to Screen	**ALL** HIV positive patients
Screening Frequency	**Yearly** for Non-tenofovir disoproxil fumarate (TDF) containing ARV regimens **Three monthly** for first year and then **6** monthly thereafter for patients on **TDF** **Three (3) monthly** in patients with chronic kidney injury (eGFR <60ml/min)
How to screen	Serum **UEC** and estimated glomerular filtration rate (**eGFR**) Serum **Phosphate** if on TDF Spot urine **albumin-creatinine ratio (ACR)** for all and **protein-creatinine ratio (PCR)** if on TDF

Some ARVs that require dose adjustment in patients with renal impairment

	Usual Dose	Creatinine Clearance (based on Cockroft-Gault equation)			
		30 – 49 ml/min	**15 – 29 ml/min**	**5 – 14 ml/min**	**Dialysis**
Lamivudine	**300mg daily**	150mg daily	100mg daily	50mg daily	25mg daily
Emtricitabine	**200mg daily**	Usual dose	200mg 72 hrly	200mg 96 hourly	
Tenofovir (TDF)	**300mg daily**	Consider ceasing			
Tenofovir (TAF)	**25mg daily (unboosted)**	Usual dose	Do not commence if CrCl <30 ml/min		
Atazanavir	**300mg daily (with ritonavir)**	Do not use in treatment experienced people on dialysis			
Maraviroc	**300mg BD**	Not recommended if CrCl <30ml/min			

Tenofovir Disoproxil Fumarate (TDF) induced renal dysfunction

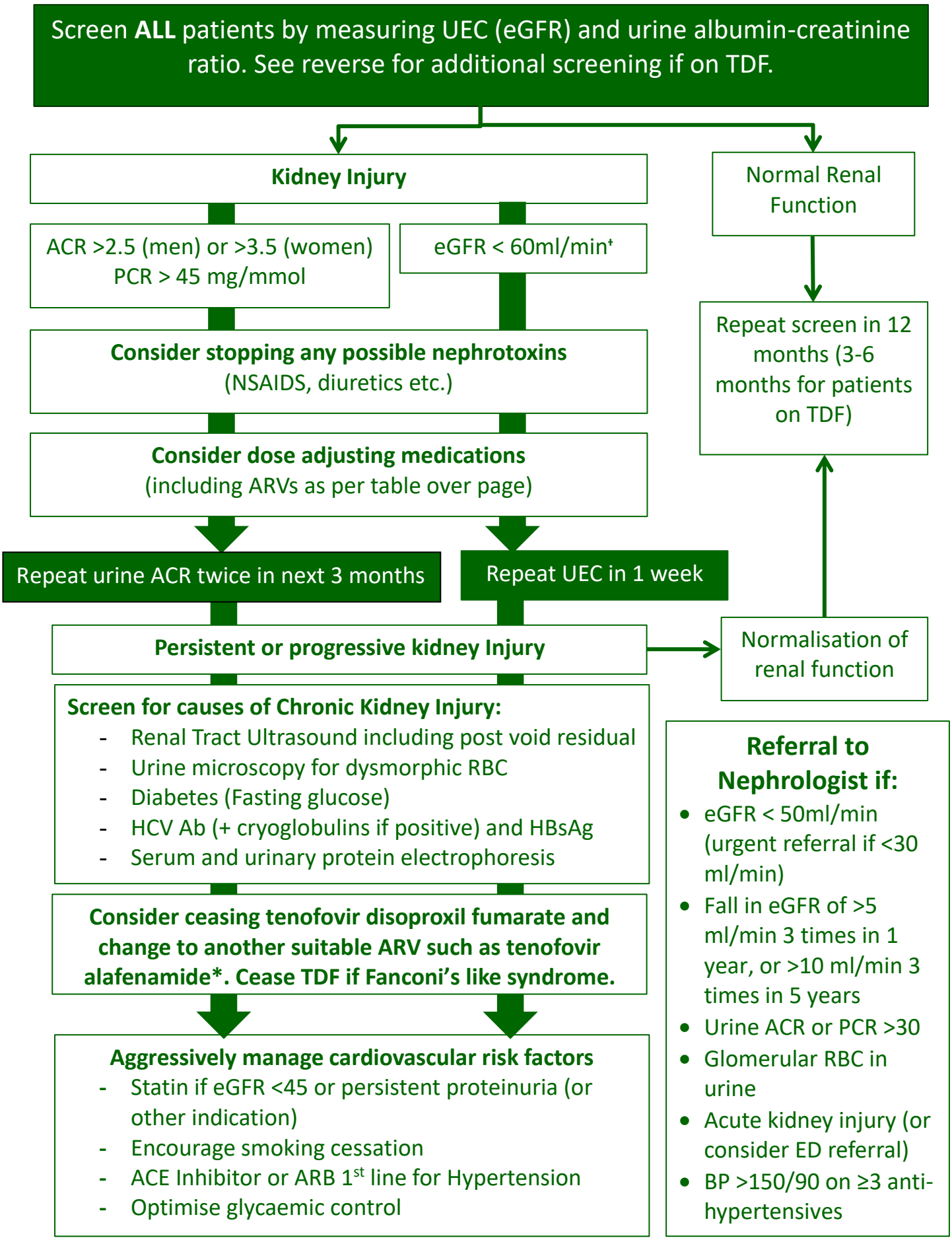
TDF can lead to proximal renal tubule toxicity (Fanconi-like syndrome) which occurs in 0.5 – 1.5% of patients receiving TDF. Is often reversible if TDF is ceased in the early stages. It can also cause a slow decline in eGFR.

Some Features of Fanconi-like Syndrome:

- Glycosuria
- Tubular proteinuria (compared to albuminuria)
- Hypophosphatemia (<0.8 mmol/L)

TDF should be ceased in all patients with Fanconi's like syndrome
Consider ceasing TDF if chronic kidney injury identified (eGFR <60mL/min/1.73m2) or high risk for chronic kidney disease
TDF should be exchanged for a suitable alternative (such as tenofovir alafenamide) - ensure HIV resistance profile and hepatitis B status taken into account. TAF not recommended if eGFR <30mL/min/1.73m2

Prepared by Janine Trevillyan, Jenny Hoy, Sarah Whiting, Rowan Walker, Anastasia Chrysostomou May 2018



† Cobicistat and dolutegravir decrease eGFR without true effect on glomerular filtration
If changing TDF to an alternative other than TAF ensure HIV resistance profile and hepatitis B status taken into account. TAF not recommended if eGFR <30mL/min/1.73m2

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Liver Health in HIV

Who to Screen	Any HIV positive patient
Screening Frequency	**3 monthly** if on hepatotoxic medications otherwise **annually**
How to screen	LFTs (Note that atazanavir will cause hyperbilirubinemia which is not clinically significant if less than 100µmol/L) Annual Hepatitis A, B and C serology if remains at risk (eg unvaccinated for hep A & B, ongoing IVDU/MSM for hep C) If HepBcAb + HepBsAb positive/HepBsAg negative – immune If HepBsAg + HepBcAb positive OR HepBcAb positive + HepBsAg and HepBsAb negative – annual HBV DNA, HepBsAb, HepBsAg

Causes of Persistent Abnormal LFTs	
Condition	**Assessment**
Alcohol	Alcohol history
Drugs	Drug history, including non-prescription and alternative therapies
Viral Hepatitis	Hep B serology (HbsAg/HBsAb/HBcAb) and Hep C serology/HCV RNA (Hep A IgG to determine immunity)
Autoimmune Hepatitis	ANA, ASMA, AMA, anti- LKM
Coeliac Disease	Coeliac serology
Hemochromatosis	Iron studies
Wilson's Disease	Ceruloplasmin
α1-antitrypsin deficiency	α1-antitrypsin
Fatty Liver	Liver Ultrasound (presence of steatosis when other causes such as alcohol have been excluded)
Non hepatic causes	Myopathy, strenuous exercise, heart failure

Management of Non Alcoholic Fatty Liver Disease (NAFLD)

1. Diet and Exercise advice (involve dietician) cornerstone of therapy
2. Consider referral for bariatric surgery if 18-65 years old, and BMI >40 (or BMI >35 and an additional obesity related co-morbidity such as diabetes)
3. Avoid alcohol
4. No compelling evidence for the use of Vitamin E, metformin and glitazones when used purely for management of steatosis
5. Manage other cardiovascular risk factors, statins have been shown to be safe in NAFLD

Screen for liver dysfunction with LFTs , viral hepatitis screen
Vaccinate for Hepatitis A and B if non-immune

Liver Injury

ALT > 40 IU/mL

Abnormal GGT or ALP

Consider stopping any possible hepatotoxins, including alcohol

Repeat LFTs/AST/INR three times over six month period

Persistent or progressive Liver Dysfunction

Screen for causes of Liver Dysfunction (see table overleaf)
Check FBE and INR

Refer for fibroscan to assess fibrosis
(https://www.alfredhealth.org.au/contents/resources/referral-forms/Fibroscan-request-form.pdf)
N.B Fibroscan not validated in fatty liver disease

Adjust antiretrovirals as required, consider CVD neutral ARVs if fatty liver

Normal Liver Function

Repeat screen in 12 months

Normalisation of liver function

Refer to liver clinic if:

-Acute Liver Injury (ALT >200 IU/ml)
-Significant fibrosis/ cirrhosis
-HCC suggested on US
-ALP >200 U/L

Refer to ID Hepatitis co-infection clinic if:

Chronic Hepatitis B or C identified

Common ARVs that require dose adjustment in patients with liver impairment

	Usual Dose	Childs Pugh Score (https://www.mdcalc.com/child-pugh-score-cirrhosis-mortality)		
		A	B	C
Abacavir	300 mg BD or 600 mg daily	200mg BD	Contraindicated	Contraindicated
Efavirenz	600mg daily	No adjustment but may increase CNS effects		
Nevirapine XR	400mg daily	No adjustment	Contraindicated	
Atazanavir (with booster)	300mg daily	No adjustment	No adjustment but no booster recommended	Not recommended
Darunavir (with booster)	800mg daily	No adjustment		Not recommended

Prepared by Joseph Sasaadeuz, Jenny Hoy, Sarah Whiting, Stuart Roberts May 2018

Bone Health in HIV

Who to Screen	Any HIV positive patient **> 40 years old**
Screening Frequency	**3 yearly** until > 60 years of age then **annually**
How to screen	- DEXA for high risk (see overleaf) - Calculate FRAX score (mark **YES** for other secondary causes of osteoporosis) for everyone else - Measure serum Ca, PO_4, Vitamin D - Screen for testosterone deficiency (in men)

Calcium and Vitamin D Supplementation

	Definition of deficient	Replacement Doses	Comments
25-OH Vitamin D	<50 nmol/L mild deficiency	1,000 IU daily	Check ALP and PTH to exclude osteomalacia. Replace before treat with bisphosphonates
	<25 mod-severe deficiency	4,000 IU daily for 4 weeks, then 1,000 IU daily	
Calcium	Less than 3 serves of high calcium food (i.e. dairy) per day	**Encourage increased dietary intake**	**First line**
		If osteoporosis or >80y.o, supplement with **caltrate** 600mg daily if dietary calcium inadequate	Must be taken with food. Do not take within 2 hours of oral bisphosphonate

Screening for Secondary Causes of Osteoporosis

Condition	Screening Test
Hyperparathyroidism	Parathyroid Hormone (PTH), Ca
Hypogonadism	(Men) Free & total Testosterone Luteinizing Hormone (LH) (Women) Menstrual history, Oestradiol, FSH and prolactin
Cushing's syndrome	If clinical suspicion order late evening salivary cortisol
Hyperthyroidism	Thyroid function tests (TFT)
Renal disease	UEC, if on TDF also Se PO4, spot urine PO4, fractional excretion PO4, urine PCR
Vitamin D Deficiency	Vit D level
Coeliac Disease	Coeliac antibodies
Liver disease	LFTs
MGUS/ Myeloma	SPEP/ and light chains

Treatment for Osteoporosis

Non Pharmacological	Quit smoking, cease excessive alcohol intake, resistance and balance exercise for falls reduction
Pharmacological	
Zoledronic Acid	5mg IV 1-2 yearly
Risedronate	35 mg p.o. weekly
Alendronate	70 mg p.o. weekly
Comments	
Take oral bisphosphonates after fasting overnight and after taking stay fasting/ upright for 30min	
Bisphosphonates should not be given to patients undergoing dental procedures	
Avoid Bisphosphonates if CrCl<35ml/min	

Prepared by Jenny Hoy, Sarah Whiting, Daniel Fineberg and Duncan Topliss May 2018

Encourage healthy diet (including adequate calcium), appropriate sunlight exposure, smoking cessation, minimial alcohol and resistance exercise for fracture prevention

Does the patient meet the following (MBS reimbursable) criteria for high risk?

- Age > 70 y.o
- Primary Hyperparathyroidism
- Hypogonadism
- Premature menopause
- Hyperthyroidism
- Cushing's syndrome
- Chronic Liver Disease
- Chronic Kidney Disease
- Coeliac Disease or other malabsorptive conditions
- Rheumatoid Arthritis
- Prednisolone (≥7.5mg daily for 3 months) or androgen deprivation therapy

No → **Calculate FRAX score (10 year fracture risk)** www.shef.ac.uk/FRAX/tool.jsp

- **Low Risk** — **Major < 20% and Hip <3%** → Repeat FRAX 1-3 years
- **High Risk** — **Major > 20% or Hip > 3%** → **Lateral Thoracolumbar spine X-ray**
  - **Fracture** → **Baseline DEXA scan**
  - **No Fracture** → Refer to endocrinology

Yes → **DEXA scan to determine BMD**

- **T ≥ -1.0** Normal → Repeat DEXA In 5 years
- **T <-1 and > -2.5** Osteopenia
- **T ≤ -2.5** Osteoporosis

Consider Tenofovir DF (TDF) - induced bone disease and ceasing TDF
Screen for secondary causes of bone loss (see overleaf)

- Repeat DEXA 1-2 years
- **Bisphosphonate** → Repeat DEXA 1 year
- **If secondary cause identified may not require treatment**

Refer to Endocrinology if:

- Secondary Osteoporosis
- Severe osteoporosis on DEXA (Z score <2)
- Failure of 1st line therapy
- Osteomalacia

PBS Indications for Bisphosphonates	
Osteoporosis	Established Osteoporosis
>70 years old AND BMD T-score ≤ -2.5	Had minimal trauma fracture

Prepared by Jenny Hoy, Sarah Whiting, Daniel Fineberg and Duncan Topliss May 2018

Screening/Diagnosis and Management of STIs in HIV

Who to Screen	**ALL** HIV Positive Patients
Screening Frequency	At least annually **4 times per year (or every occasion of HIV VL testing) in MSM**
Indications for 3 monthly STI testing (every opportunity)	Any unprotected anal sex, >10 partners in 6 months Episode of STI in last 12 months Participate in group sex Use of recreational drugs during sex
How to screen/diagnose	**Collect first void urine (FVU), anal and throat swab for chlamydia and gonorrhoea PCR**  Put each site swab into COBAS transport medium Patient can self-collect anal swab if asymptomatic **LGV PCR testing** will be performed on original rectal swab if chlamydia PCR on rectal swab is positive AND patient is symptomatic
	Collect urethral &/or anal swab for gonococcal culture if discharge present or asymptomatic positive PCR result  Collect e swab
	Collect anal swab for herpes simplex (HSV) PCR if proctitis Collect e swab
	Syphilis serology quarterly, Hepatitis A IgM, Hep BsAg and Hep C serology annually

Management of Positive Results in Asymptomatic Patients

Chlamydia

Urogenital or pharyngeal chlamydia infection
Azithromycin 1g stat dose OR
Doxycycline 100mg BD for 7 days

Rectal Infection
Doxycycline 100mg BD for 7 days

Gonorrhoea

Collect swab of positive PCR site for culture and susceptibility

Ceftriaxone 500mg in 2ml of 1% lignocaine as single IM injection
plus
Azithromycin 1g as a single dose

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Management of Symptomatic Urethritis

- Doxycycline 100mg BD for 7 days (recommended first line by MSHC)
  Or
- Azithromycin 1g single dose

If symptoms or contact tracing suggest gonorrhoea is possible then treat with:

- Ceftriaxone 500mg in 2ml of 1% lignocaine as a single IM injection ***plus***
- Azithromycin 1g stat

Management of Symptomatic Proctitis

Do not wait for test results

- Ceftriaxone 500mg in 2ml of 1% lignocaine as a single IM injection ***plus***
- Doxycycline 100mg twice daily for 21 days ***plus***
- Valaciclovir 500mg bd for 5 days
  Doxycycline can be ceased if Chlamydia PCR results is negative

Management of Positive syphilis serology

Early syphilis: primary, secondary or early latent syphilis (<2 years from acquisition if previous negative test available)

- Single dose of benzathine penicillin 1.8g
  (administered as 2 x0.9 g syringes – one in each buttock)

Late syphilis: (if tertiary syphilis has been excluded)

- 3 doses of benzathine penicillin 1.8g given one week apart

Indications for LP to rule out neurosyphilis	1. Neurological (including hearing loss and tinnitus) or ophthalmic signs or symptoms 2. Evidence of tertiary syphilis 3. Failure of RPR titre to fall 4-fold within 12 months of adequate treatment 4. Some recommend LPs in those with low CD4 cells, High RPR (>1:32) and late latent syphilis
Other Considerations	Test of cure with PCR no earlier than four weeks if: • rectal chlamydia • symptomatic or PCR positive gonorrhoea at any site or use of non standard therapy Contact tracing (www.letthemknow.org.au for patients) Advise to refrain from sex for 7 days post treatment

Screening and Diagnosis of Neurocognitive Impairment

Who to Screen	Any HIV positive patient **> 45 years old** Current CD4 cell count **<350 cells/µL** Nadir CD4 cell count **<200 cells/µL** Prior CNS Opportunistic infection Family history of dementia Presence of or high risk of Cardiovascular Disease (smoker/high cholesterol/hypertension/diabetes mellitus)
Screening Frequency	**Annually, or presence of symptomatic cognitive difficulty**
How to screen	**Instrumental Activities of Daily Living (IADL) Scale OR 3 questions** 1) Is the patient experiencing frequent problems with memory? 2) Does the patient feel they are slower planning activities, problem solving or making decisions? 3) Does the patient have difficulty paying attention to reading, conversations or watching a movie? - If possible, collateral history from partner/family/colleagues

Confounding conditions

- Severe Psychiatric conditions
- Use of Psychotropic drugs
- Alcohol excess
- Sequelae from prior CNS pathology
- Current CNS Opportunistic Infections or neurological disease
- Cardiovascular disease or high CVD risk: hypertension, diabetes

Investigations for Neurocognitive impairment

- Drug & Alcohol assessment
- Depression screen
- Brain MRI
- Formal neuropsych assessment
- CSF examination – biochemistry, cell count, HIV VL, EBV PCR, CMV PCR
- Cerebrovascular assessment
- APOE-Ɛ4 gene allele

Initial screen confirms cognitive difficulty **IADL Score of 0 on 2 or more measures or presence of memory, attention or planning**

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Evaluate & manage confounding conditions
Rescreen 3 months after confounding condition managed

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Formal Neuropsychological examination OR **International HIV Dementia Scale – Score of ≤10 – evaluate further for dementia**

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Neurocognitive Impairment confirmed

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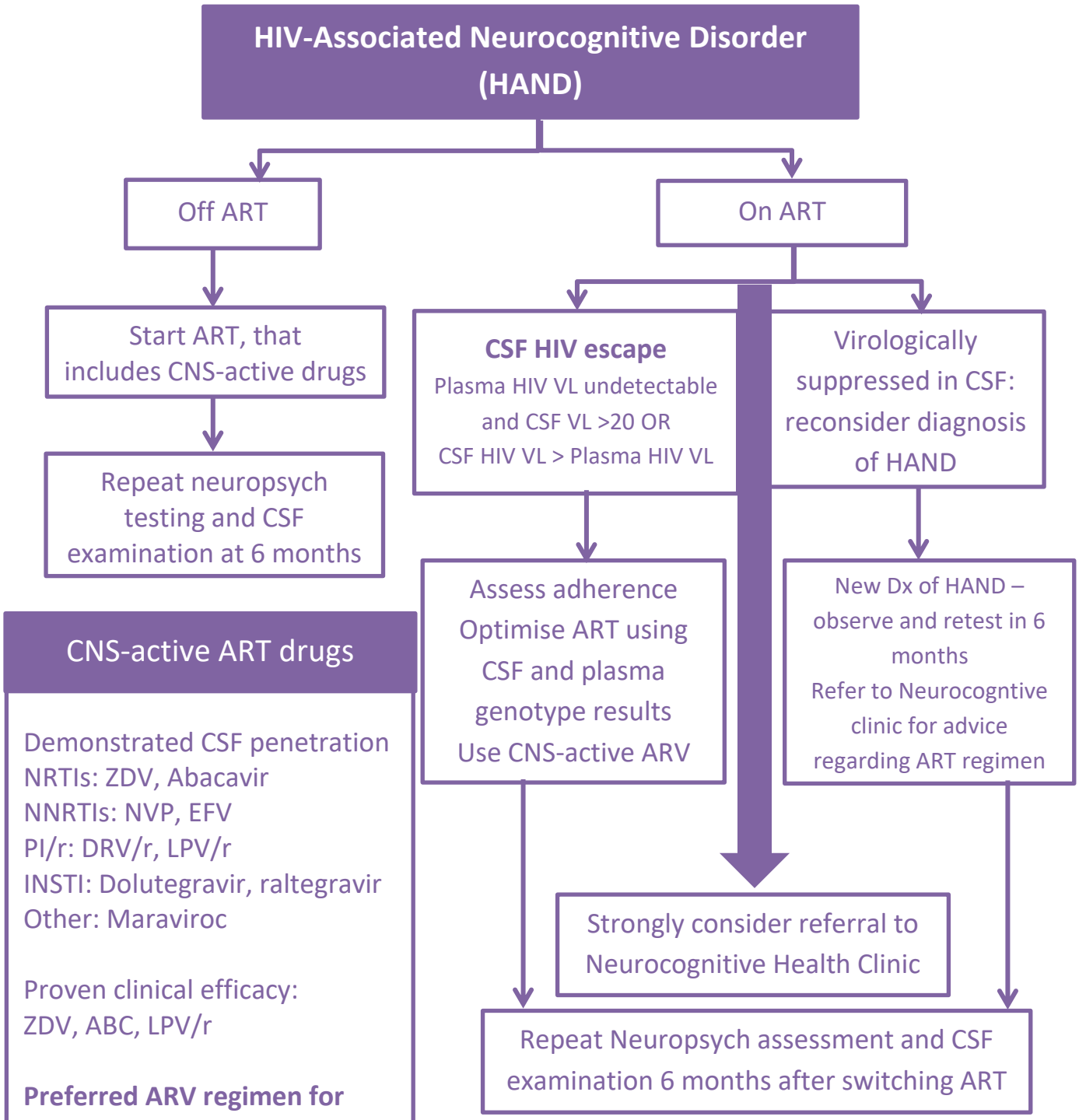
Neurological Exam + Brain MRI + CSF examination to exclude other possible causes of impairment

Prepared by Edwina Wright, Jenny Hoy May 2018


HIV-Associated Neurocognitive Disorder (HAND)
Off ART
On ART
Start ART, that includes CNS-active drugs
Repeat neuropsych testing and CSF examination at 6 months
CSF HIV escape
Plasma HIV VL undetectable and CSF VL >20 OR
CSF HIV VL > Plasma HIV VL
Virologically suppressed in CSF: reconsider diagnosis of HAND
Assess adherence
Optimise ART using CSF and plasma genotype results
Use CNS-active ARV
New Dx of HAND – observe and retest in 6 months
Refer to Neurocogntive clinic for advice regarding ART regimen
Strongly consider referral to Neurocognitive Health Clinic
Repeat Neuropsych assessment and CSF examination 6 months after switching ART
CNS-active ART drugs
Demonstrated CSF penetration
NRTIs: ZDV, Abacavir
NNRTIs: NVP, EFV
PI/r: DRV/r, LPV/r
INSTI: Dolutegravir, raltegravir
Other: Maraviroc
Proven clinical efficacy:
ZDV, ABC, LPV/r
Preferred ARV regimen for HAND in 2018:
Abacavir/3TC/dolutegravir +/- boosted darunavir