



GUIDELINE

Management of mental health disorders and central nervous system sequelae in HIV-positive children and adolescents

By the Southern African HIV Clinicians Society

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HIV-positive children and adolescents are at increased risk of both central nervous system (CNS) sequelae and mental disorders owing to a number of factors, including the impact of HIV infection on the brain, social determinants of health (e.g. poverty and orphanhood) and psychosocial stressors related to living with HIV. Every effort should be made to identify perinatally HIV-infected children and initiate them on antiretroviral therapy early in life. HIV clinicians should ideally screen for mental health and neurocognitive problems, as part of the routine monitoring of children attending antiretroviral clinics. This guideline is intended as a reference tool for HIV clinicians to support the early identification, screening and management of mental health disorders and/or CNS impairment in children and adolescents. This guideline covers mental disorders (section 1) and HIV-associated neurocognitive disorders (section 2) among children and adolescents.

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Untreated perinatally HIV-infected (PHIV) children are at increased risk of central nervous system (CNS) sequelae compared with HIV-infected children who begin antiretroviral therapy (ART) in infancy. HIV invades the developing CNS earlier and with greater severity than observed in adults and with a more rapid progression to death. In addition, patients receiving ART may remain vulnerable to the effects of HIV on the brain because the CNS may be a reservoir for persistent viral replication. Initiation of ART, therefore, does not fully reverse CNS insults, particularly if treatment is not initiated during infancy.^[1] Psychosocial stressors, such as poverty, orphanhood and parental illness (physical and mental), experienced by HIV-positive children living in disadvantaged communities place them at further risk of poor educational and mental health outcomes. Furthermore, the onset of adolescence presents new challenges related to adherence issues, the provision of adolescent-friendly clinical environments, academic problems, mental health problems, and sexual and other risk behaviours.^[2]

1. Mental disorders among HIV-infected children and adolescents

PHIV children present with high rates of mental disorders that exceed population norms and rates in other chronically ill children.^[3]

1.1 Overview of mental disorders in children and adolescents

Prevalence:

- In HIV-positive children, prevalence rates of 25 - 50%
- Most common: attention deficit hyperactivity disorder (ADHD), mood disorders, anxiety disorders, substance use disorders (SUDs) (adolescents)
- Less common: psychotic disorders, bipolar mood disorder

Risk factors:

- Previous AIDS-defining diagnosis, lower intelligence quotient, caregiver psychiatric disorder, parental loss, limit-setting problems

Effects:

- Untreated psychiatric illness may affect ART adherence, and educational and medical outcomes
- Adolescents vulnerable to depression, non-disclosure, school failure/dropout, sexual risk behaviours and SUDs

1.2 Screening for mental disorders

- Accurate diagnosis requires a thorough history, and assessment of the mental state of the child and of the family.
- Collateral information from the educator and/or extended family provides essential additional information.
- The objective is to detect and refer suspected cases of children presenting with mental health disorders for a more comprehensive assessment. The detection of psychosocial

dysfunction is important as it may contribute to non-adherence and later treatment failure.^[4]

- When screening for mental health problems, remember multiple interacting factors such as those within the child, home, school and external environment, all of which influence emotions/behaviour.
- No brief screening tool has been validated worldwide specifically for the detection of mental health disorders among HIV-positive children and adolescents. Table 1 presents some well-validated screening tools that may be utilised in primary care settings.
- A rapid screen of the commonly occurring mental disorders should be performed at the ART clinic and patients should be referred for a mental health assessment (Tables 2 and 3).

1.2.1 Referral criteria based on mental health screen

Refer or discuss the child with a mental health professional (mental health nurse, psychologist, child psychiatrist, psychiatrist) if the child presents with the following:

- Symptoms of ADHD
- Frequent or daily symptoms of anxiety that have affected functioning at home and at school
- Frequent or daily symptoms of depression/low mood, which have affected functioning at home and at school
- Suicidal ideas, intentions, plans or previous attempts
- Misuse of cannabis, methamphetamine, alcohol or any other illicit substance
- Confusion or change in behaviour/functioning from baseline

Refer or discuss with a social worker if additional information reveals the following:

- Maltreatment of the child (e.g. physical or sexual abuse)
- Adverse socioeconomic circumstances requiring assistance
- Limited or no parental care (child-headed household)
- Substance abuse

1.3 Assessment and diagnosis of mental disorders

Tables 4 and 5 outline the assessment and diagnosis of ADHD and major depressive episodes, respectively.

1.4 Assessment and diagnosis of anxiety disorders

- Anxiety may present in children in a variety of ways (Table 6):
 - General symptoms include withdrawal, worries, fears, anticipation of threat and anxiety-themed dreams. These may be associated with vigilance/caution in anticipation of threat and avoidant behaviour.
 - Common physical symptoms include nausea and vomiting, headaches and abdominal cramps. Cardiovascular symptoms such as palpitations and dizziness are less common in children.
- Anxieties may be related to worries about the child's illness, the parent/caregiver, school, placement insecurity or the general environment.
- Anxiety disorders that occur more commonly in childhood include separation anxiety disorder, selective mutism and specific phobias.
- Adolescents may additionally present with social anxiety (social phobia) and panic disorder. The clinical presentation may more closely resemble that of adults. Generalised anxiety disorder may occur across the lifespan.^[5]

1.5 Assessment and diagnosis of psychotic disorders

Neuropsychiatric symptoms in an HIV-positive child or adolescent include psychosis, severe mood disturbance, delirium or encephalopathy. Psychotic symptoms (hallucinations, delusions, formal thought disorder) and mania are less common among HIV-positive children and adolescents compared with adults, and therefore have a high index of suspicion of a comorbid medical condition such as a CNS disorder.

- Consider a psychotic disorder if there is a positive family history of mental illness, particularly schizophrenia or bipolar mood disorder.
- Suspect delirium if a patient presents with an acute onset of psychotic symptoms associated with confusion and clouding of consciousness that tends to fluctuate. Exclude general medical conditions (GMCs) such as seizures, meningitis, encephalitis, brain tumour or stroke. Failure to recognise delirium may delay the diagnosis of an underlying medical condition and may lead to an adverse outcome and even death.^[5]

Table 1. Validated screening tools for mental disorders in children and adolescents*

Screening instrument	Clinical condition	Source
SDQ (available in English, Afrikaans, Xhosa and Zulu)	Psychosocial functioning	http://www.sdqinfo.org/py/sdqinfo/b0.py
Conner's scales (parent, teacher)	ADHD	http://www.doctorrudy.com/files/teacher_add_adhd_short.pdf http://www.doctorrudy.com/files/add_adhd_parent_long.pdf
SNAP-IV rating scale	ADHD	http://www.adhd.net/snap-iv-form.pdf
Subscale of SDQ	Depression	www.sdqinfo.org/py/sdqinfo/b0.py
Paediatric symptom checklist	Psychosocial function	http://www.brightfutures.org/mentalhealth/pdf/professionals/ped_symptom_chklst.pdf
SCARED	Anxiety	http://www.psychiatry.pitt.edu/sites/default/files/Documents/assessments/SCARED%20Child.pdf http://www.psychiatry.pitt.edu/sites/default/files/Documents/assessments/SCARED%20Parent.pdf

SDQ = Strengths and Difficulties Questionnaire; ADHD = attention deficit hyperactivity disorder; SNAP-IV = Swanson, Nolan and Pelham, 4th revision; SCARED = Screen for Child Anxiety Related Disorders.

* Consult the relevant International Academy of Child and Adolescent Psychiatry and Allied Professions (IACAPAP) book chapter, which provides an overview of clinical assessment of a child: <http://iacapap.org/wp-content/uploads/A.5-CLINICAL-EXAMINATION-072012.pdf>

1.5.1 Delirium

- Delirium is a nonspecific neuropsychiatric disorder that occurs in medically ill patients, signifying global encephalopathic dysfunction. It commonly occurs across the age extremes (the very young and geriatric patients). However, it can occur in all ages, particularly in seriously ill patients with limited cognitive reserves and/or CNS conditions. It is well recognised in the elderly but underdiagnosed in children.
- Onset confers a poorer prognosis for an underlying medical condition.
- The core features comprise an altered level of consciousness, attention disturbances and diffuse cognitive deficits. Symptoms fluctuate and may present with behavioural disturbances (e.g. aggression) and perceptual disturbances, commonly visual hallucinations.

Children who have not been initiated on ART due to adequate CD4⁺ counts and who have psychiatric symptoms that are poorly responsive to antipsychotics may have detectable/high CNS viral loads despite undetectable serum viral loads (due to differing mutations in cerebrospinal fluid (CSF) and serum). These children should be initiated on ART, which may contribute to the resolution of psychotic symptoms.

Children already on ART who have psychotic symptoms poorly responsive to antipsychotics should be assessed for a comorbid CNS disorder and/or have their ART regimen reviewed and a CNS penetrating regimen considered.⁶¹ The Montreal Cognitive Assessment may be a useful screening instrument to detect cognitive impairment in adolescents.

- [https://pdbp.ninds.nih.gov/assets/crfs/Montreal Cognitive Assessment \(MoCA\)7_1.pdf](https://pdbp.ninds.nih.gov/assets/crfs/Montreal%20Cognitive%20Assessment%20Scoring%20and%20Instructions.pdf)
- <https://pdbp.ninds.nih.gov/assets/crfs/Montreal%20Cognitive%20Assessment%20Scoring%20and%20Instructions.pdf>

1.6 Differential diagnoses to consider

- Schizophreniform disorder
- Schizophrenia
- Bipolar mood disorder: usually a history of a previous episode of elevated mood resulting in abnormal behaviour, e.g. decreased sleep, euphoria, hypersexuality, grandiosity and increased energy
- Mood or psychotic disorder secondary to GMC: HIV encephalopathy, seizures, tumours (frontal lobe), side-effect of efavirenz
- Substance-induced psychotic or mood disorder: cannabis, methamphetamine

1.7 Mental status examination of the child or adolescent

The mental status examination of a child comprises observation of play, quality of caregiver-child interactions, verbalisations and also interpretation of drawings. The mental state of an adolescent more closely resembles that of an adult patient.

1.7.1 Recording the mental state examination (MSE)

The MSE is an essential part of the psychiatric evaluation. The objective is to describe the child or adolescent's appearance, behaviour, symptoms and cognitive functioning during the examination.

- Physical appearance: age, grooming, clothes, cleanliness, dysmorphic features, bruising, scars

- Behaviour and manner of relating to caregivers and interviewer: eye contact, ability to co-operate, quality of play, interaction with caregiver
- Mood and affect: range, type and appropriateness of affect (objectively euthymic, depressed, elevated)
- Anxiety: fears, separation difficulties, phobias
- Psychomotor behaviour: activity level, tics, co-ordination
- Content and form of thinking: delusions, preoccupations, ruminations, violence, anxiety themes, thought disorder
- Speech and language: fluency, language skills, volume, rate
- Perceptual abnormalities: evidence of hallucinations (e.g. visual, auditory, olfactory)
- Overall cognitive ability: developmentally appropriate behaviour and drawings, general knowledge, vocabulary
- Attention, concentration and memory: attention and concentration, short- and long-term recall
- Level of consciousness: fluctuation, orientation for time, person and place
- Insight and judgement into own condition: acknowledgement of problem, attitude to receiving help, willingness to adhere to treatment, ability to judge hypothetical situations

The child should ideally be interviewed in his/her first language.

1.8 Management of HIV-positive children and adolescents presenting with mental disorders

See Fig. 1, which summarises the assessment and management of HIV-positive children presenting to primary care services.

1.8.1 Risk assessment

- Risk assessment includes evaluation of the following:
 - Risk to self: suicidal thoughts or intent or self-harming behaviour; a patient may require hospitalisation in cases of a serious suicide attempt or intent
 - Risk to others: thoughts or intention to harm others
 - Risk-taking behaviour such as reckless driving, violence, disinhibited sexual behaviour, antisocial behaviour (engaging in unlawful acts) and unprotected sex
- Additional risk to children is related to adverse child care, e.g. minimal parental/family or social support, neglect, physical, emotional or sexual abuse, abandonment.

1.8.2 Referral

- Be aware of referral pathways in your own facility and local district. Communicate with colleagues providing mental health services at primary and district levels, such as a dedicated mental health nurse practitioner, psychiatric registrar, psychologist, occupational therapist and district psychiatrist.
- Have a high index of suspicion for new-onset psychiatric symptoms that may present as a result of an acute or subacute infection or general medical condition, such as AIDS-defining infections, intracranial viral or bacterial infections, and delirious states due to substance abuse/withdrawal/infection or medication.
- Referral for any suspected mental health problems at primary level care should be to a mental health nurse practitioner (or psychiatric registrar, if available). Less severe or uncomplicated cases may be

managed at primary level in discussion with the district psychiatrist and mental health team at specialist level.

- Complex cases (e.g. comorbid psychiatric and medical illness such as seizures, other CNS conditions, comorbid substance misuse and psychotic symptoms, catatonia and severe depression) should be referred to the district psychiatrist or specialist child and adolescent mental health (CAMH) services within the catchment area for assessment and possible hospitalisation.
- Refer suspected cases of child abuse to the facility social worker, who may refer to an external social worker for statutory intervention.
- Refer to an occupational therapist at community level, who may do group-based interventions, or adherence groups and functional assessments.

- Refer to the district psychologist for a psychological evaluation of the child and family.

1.8.3 Liaison

- Communicate with the educator and school psychologist (with the family's consent) to obtain accurate information.
- Liaise with relevant adult services if you suspect parent or caregiver mental health problems.

1.8.4 Attitude to family

- Be sensitive and non-judgemental in your attitude.
- Be aware of and attend to issues about stigma.
- Comply with the rules of confidentiality at all times.

Table 2. Detecting commonly occurring mental disorders among HIV-infected children

Interviewee	Questions	
Parent/ caregiver	ADHD	Ask about level of activity, attention and impulsivity, e.g.: <ul style="list-style-type: none"> • Does the child struggle to sit still, move around constantly, fidget? • Is he/she able to concentrate on a task, focus on homework? • Does he/she wait his/her turn or act without thinking? Example answer: <i>When he watches TV, he rocks and moves all the time and then gets up and walks/runs around. He looks around and interrupts conversations while he is doing his homework. He runs over the road without looking.</i>
	Depression/ mood symptoms	<ul style="list-style-type: none"> • Is the child tearful, irritable, withdrawn from peers, disinterested in play most of the time? • Does the child talk about death or say he/she wants to die? Example answer: <i>She is moody and gets angry and cries quickly. She doesn't want to play with her friends anymore. She used to like to play with her doll but now doesn't want to. She sometimes says she wants to die.</i>
	Anxiety symptoms	<ul style="list-style-type: none"> • Does the child worry excessively, or feel fearful/scared? Example answer: <i>She is quiet and is scared of the dark and thunder. She worries that she will fail at school and worries about me (that I will get sick and die) and that there is no money. She talks about it all the time and it makes her not want to play or go to school.</i>
Child	School	Tell me about school: <ul style="list-style-type: none"> • What do you like? What don't you like about school? • Have you been in trouble at school? What for? Example answer: <i>I like my teacher and playing outside. I don't like schoolwork (sums, reading out loud in class) and when the other children tease me or hit me. I was in trouble because I didn't do my homework.</i>
	Mood	<ul style="list-style-type: none"> • What makes you happy or laugh a lot? • What makes you sad or want to cry? Example answer: <i>I am happy when I play with my friend and when I go out with my mommy to the shop. I cry when they argue or fight in the house. I feel sad when I stay long in hospital.</i>
	Anxiety	<ul style="list-style-type: none"> • Do you have a lot of worries? Example answer: <i>Yes, I worry that I am sick and that I have to go to hospital and may die. I worry about my mommy because she is sick too. I worry that she won't be able to work anymore. I worry when it rains hard as the water may flood our house, and then we have nowhere to go.</i>
Caregiver: academic enquiry		<ul style="list-style-type: none"> • Pick a feeling that you feel almost every day, e.g. happy, sad, scared, worried. (You may present the child with pictures of different faces.) Example answer: <i>I feel worried a lot, like every day.</i>
		<ul style="list-style-type: none"> • Ask to see the latest school report • Send the teacher Conner's scale (ADHD screening tool) • Send a written request for information about the child

ADHD = attention deficit hyperactivity disorder.

Table 3. Detecting commonly occurring mental disorders among HIV-infected adolescents

Interviewee	Questions
Parent/ caregiver	<ul style="list-style-type: none"> • Is your adolescent very moody, tearful, sad and withdrawn? • Does your child ever say he/she wants to die or talk about attempted suicide? • Is he/she worried, fearful/scared or complaining of nightmares? • Do you know if your adolescent has taken drugs or had unprotected sex? <p>Example answers: <i>She locks herself in her room, is irritable, ignores us/doesn't talk to us. I hear her crying in her room a lot. She worries that she will fail, says she can't sleep and that she is having bad dreams. She sometimes says she wants to die/will kill herself.</i> <i>He smokes 'weed'/ganja' with his friends. He has a girlfriend but I don't know if they use condoms.</i></p>
Adolescent	<ul style="list-style-type: none"> • Do you feel sad or worried, or feel like crying very often (every day or most days)? • Do you think about death or wanting to die? • Have you experimented with alcohol/drugs or had unprotected sex? <p>Example answers: <i>I feel bad, like low/down, so that I don't feel like getting out of bed. I think all the time of bad stuff, like I'm going to die or be alone.</i> <i>Yea, I worry about a lot of stuff, that my boyfriend will leave me if he finds out I'm positive, that I'm going to fail or that I'm going to get sick as I keep forgetting to take the medicine for HIV.</i> <i>I smoke 'weed'/ganja' with my friends and we drink brandy over the weekend. My girlfriend is on the injection so we don't use condoms.</i></p>
Caregiver/adolescent: academic enquiry	<p>Ask to see the latest school report. Ask the adolescent to report on his/her academic function and school, e.g.:</p> <ul style="list-style-type: none"> • Tell me about school, e.g. your likes and dislikes? Are you ever in trouble at school? What for? <p>Ask the adolescent to report on his/her academic functioning and school, e.g.:</p> <ul style="list-style-type: none"> • Tell me about school, e.g. likes and dislikes? Are you ever in trouble at school? What for? <p>Send the teacher a copy of Conner's scale or SNAP-IV to complete and a written request for information about the adolescent.</p>

SNAP-IV = Swanson, Nolan and Pelham, 4th revision.

Table 4. Assessment and diagnosis of ADHD^[5]

DSM-V criteria	Presentation in children	Presentation in adolescents
Persistent inattention and/or hyperactivity/impulsivity		
Inattention symptoms (six or more of following):	As per DSM-V criteria	As per DSM-V criteria
<ul style="list-style-type: none"> • Poor attention to details, careless mistakes • Difficulty sustaining attention • Does not listen • Does not follow instructions • Struggles to organise activities and tasks • Task avoidant or dislikes tasks • Loses things • Easily distracted by external stimuli • Forgetfulness 		
Hyperactivity/impulsivity symptoms (six or more of following):	As per DSM-V criteria	Hyperactivity symptoms may wane but impulsivity persists in some cases to adulthood
<ul style="list-style-type: none"> • Fidgety • Leaves seat • Runs or climbs when not appropriate • Unable to play or engage in leisure activities • Often 'on the go', acts 'like a motor' • Talks excessively • Blurts out answers • Struggles to wait turn • Interrupts or intrudes on others 		

ADHD = attention deficit hyperactivity disorder; DSM-V = Diagnostic and Statistical Manual of Mental Disorders (5th edition).

Table 5. Assessment and diagnosis of major depressive episode^[5]

DSM-V criteria	Presentation in children	Presentation in adolescents
<ul style="list-style-type: none"> Depressed mood almost all day, every day OR <ul style="list-style-type: none"> Loss of interest or enjoyment of usually pleasurable activities for most of the day AND <ul style="list-style-type: none"> Diminished pleasure or interest in most activities, most of the day Significant weight loss (i.e. >5 kg) Insomnia or hypersomnia (inability to sleep/excessive sleep) Psychomotor agitation or retardation Loss of energy or fatigue Feelings of worthlessness or inappropriate, excessive guilt Decreased ability to think or concentrate, or indecisiveness (either by subjective account or as observed by others) Thoughts of death that are recurrent, or recurrent suicidal ideation without a specific plan, or a specific plan for committing suicide or a suicide attempt 	<ul style="list-style-type: none"> Irritable mood, tearfulness Loss of interest in play, toys or friends Decline in academic performance Somatic complaints such as abdominal pain and/or headache 	<ul style="list-style-type: none"> Similar to adults Irritability Social withdrawal from peer group Suicide risk may increase

DSM-V = *Diagnostic and Statistical Manual of Mental Disorders* (5th edition).

1.8.5 Management of depression and anxiety in HIV-positive children and adolescents

- Conduct a thorough history and clinical assessment. This includes information about functioning at school.
- Interview the child/adolescent alone and with the caregiver.
- Initiate first-line psychosocial intervention, i.e. address precipitating or perpetuating stressors, e.g. bullying, stigma. Refer the child for play/individual/group therapy if resources are available and according to the child's intellectual ability; alternatively, refer to the school counsellor. Refer parents to local parenting groups and/or for their own psychological or psychiatric interventions as necessary.
- For moderate to severe symptoms, initiate selective serotonin re-uptake inhibitor (SSRI) in addition to psychosocial management.
 - Initiate with a low dose and titrate slowly, preferably with citalopram 5 mg or 10 mg daily, or fluoxetine 5 mg or 10 mg daily if citalopram is not available. (Administer by opening a capsule into 20 ml of orange juice to create a 1 mg/ml solution. Use a 5 ml or 10 ml syringe to measure out the daily dose. Keep the remainder refrigerated.)

Fluoxetine or citalopram may be prescribed for moderate to severe depression and anxiety disorders. Citalopram is preferable because of potential drug-drug interactions between fluoxetine and certain antiretroviral medications. Fluoxetine can increase agitation and impulsivity, so monitor closely.

- Titrate up to the therapeutic dose (as per EDL).
- Monitor adolescents or older children closely for suicidal ideation and SSRI side-effects, e.g. behavioural disinhibition or activation.
- Review in 1 month. Titrate up to 10 - 20 mg (or beyond up to a maximum of 30 - 40 mg) if indicated and if there are no adverse side-effects.
- Reassure the patient and parent that most side-effects are transient and dose related.

- Refer a child with moderate to severe symptoms and with poor response to treatment to a local child psychiatric service if available, or discuss with a psychiatrist (or child psychiatrist if available).
- Treatment for depression should ideally be for 6 - 12 months after symptom resolution, after which the patient may be weaned off medication. Discuss with a mental health professional or child psychiatrist.
- Treatment duration for anxiety disorders is usually 6 - 12 months after symptom resolution. However, treatment duration and discontinuation of medication management should be individualised according to the specific anxiety disorder, severity, recurrence and treatment response. Discuss with a mental health professional or child psychiatrist.

1.8.6 Management of ADHD in HIV-positive children and adolescents

- Conduct a thorough history and clinical assessment. It is important to include all spheres of the child's environment (including home, school and peers).
- Ask the parent and teacher to complete a Connor's or SNAP report.
- Establish baseline weight and height, and calculate and plot body mass index (BMI).
- Initiate psychosocial intervention, including support for parents and teachers, input on positive reinforcement, and establishing structure and routine in the child's day. Refer parents to a local parenting group if available.
- If indicated, initiate stimulant medication. The dosage should be based on the child's age and weight, i.e. 1 mg/kg body weight/day.
 - In children 6 years and older, start with 5 mg short-acting methylphenidate 2 - 3 times daily (5 mg every 3 - 3.5 hours), e.g. initiate 5 mg at 07h30, 5 mg at 11h00 and 5 mg at 14h30. Increase weekly by 5 - 10 mg, but do not exceed 30 mg daily.
 - Alternatively, in older children or adolescents, initiate long-acting methylphenidate 20 mg daily at 07h30, if available.
- Medication should be initiated only after confirmation of the diagnosis by a psychiatry registrar, medical officer or district psychiatrist.

Table 6. Overview of anxiety disorders in children and adolescents

Anxiety disorder	DSM-V criteria	Clinical presentation in children
Separation anxiety disorder	<ul style="list-style-type: none"> Excessive fear of separation from attachment figure that is inappropriate for developmental stage 	<ul style="list-style-type: none"> Stays close to parent and refusal to be away from home. Could lead to school refusal Becomes very distressed when separated Worries that attachment figure will not come home, or will become ill, become a victim of an accident, or will die
Selective mutism	<ul style="list-style-type: none"> Failure to speak in situations or environments where there is an expectation for speaking, e.g. school. Interferes with normal functioning Not associated with language problem. No associated communication disorder 	<ul style="list-style-type: none"> The child fails to speak or reciprocate with speech when spoken to The child speaks freely at home or when alone with familiar family figures Child is anxious in social situations May lead to academic problems and social difficulties
Specific phobia	<ul style="list-style-type: none"> Marked anxiety or fear about a specific situation or object e.g. animals, injections, heights, blood Fear is out of proportion to the danger posed by the object or situation Persistent and lasts 6 months or longer Causes significant distress and impairment 	<ul style="list-style-type: none"> The object of phobia evokes an immediate and extreme reaction The fear is expressed by tantrums, crying, clinging or freezing
Social anxiety disorder (social phobia)	<ul style="list-style-type: none"> Social situations evoke fear or anxiety, when the individual is exposed to scrutiny by others (conversations, being observed, meeting unfamiliar people, delivering a talk in front of class or large group) The person fears humiliation or embarrassment The social situation is endured with extreme discomfort or avoided 	<ul style="list-style-type: none"> Occurs among peers The anxiety may be expressed by freezing, tantrums, clingy behaviour, crying or failure to speak
Panic disorder	<ul style="list-style-type: none"> Feelings of intense discomfort and fear associated with physical symptoms such as sweating, palpitations, shaking, chest pain, nausea, chills or feeling hot, and numbness/tingling sensations 	<ul style="list-style-type: none"> Abrupt onset and peaks within minutes Onset may be from a calm or anxious state Intense fears of losing control or death
Generalised anxiety disorder	<ul style="list-style-type: none"> Excessive uncontrollable worry and anxiety occurring most days for longer than 6 months Requires three of six accompanying symptoms: poor sleep, fatigue, muscle tension, poor concentration, restlessness and irritability Causes distress and significant impairment in functioning 	<ul style="list-style-type: none"> Asks constant questions and seeks reassurance Complains of headaches and abdominal cramps Anxiety dreams, e.g. of being chased, storms, wild animals Requires only one of six accompanying symptoms: poor sleep, fatigue, muscle tension, poor concentration, restlessness and irritability

DSM-V = Diagnostic and Statistical Manual of Mental Disorders (5th edition).

- Use the lowest effective dosage.
- Educate parents about effects and possible side-effects.

There are no known drug-drug interactions between methylphenidate and antiretroviral medications.

- Review the child in one month. Check pulse and blood pressure. If abnormal, do an electrocardiogram (ECG), lower the dosage and continue to monitor. Medication should be discontinued if an ECG abnormality is detected and/or cardiovascular disease is observed. Refer to a cardiologist if a cardiovascular abnormality is detected.
- Assess response to methylphenidate through direct observation and feedback from teachers and parents.
- Assess weight and height and plot BMI at each visit. If there is loss of appetite, encourage the parent to provide additional calories and

snacks such as a peanut butter sandwich at night for extra protein. Stop treatment if growth curve flattens or there is significant weight loss >5 kg.

1.8.7 Management of children presenting with psychotic symptoms and/or mania

- Complex cases should ideally be referred for neuropsychiatric assessment and further investigation (including CNS investigation and neurocognitive testing) at a tertiary-level service.
- Behaviourally disturbed psychotic adolescents should be referred for admission.
- Exclude delirium before considering a primary psychotic illness. Investigations such as chest X-ray, full blood count, temperature, pulse and urine dipsticks can be used to screen for delirium before referring to secondary level for further investigations such as lumbar punctures and/or neuroimaging.

- Antipsychotics may be initiated at low doses, but with caution and after discussion with a psychiatrist. Initiate risperidone 0.5 - 1 mg daily and increase the dose by 0.25 - 0.5 mg daily every 1 - 2 weeks, depending on tolerance and age of the child. Refer for admission to tertiary CAMH or psychiatric unit if doses in excess of 3 mg are required.

1.8.8 Medication management

- Do not prescribe psychotropic medication to children or adolescents if there is diagnostic uncertainty and/or there has not been a thorough psychiatric assessment and consultation with a specialist.
- It is important to be cautious about the use of psychotropic medications in the management of behaviour disorders in the context of HIV because of high pill burden and potential drug interactions. If medications are not seen to be working, they should be discontinued and polypharmacy should be avoided.
- Initiate at lower doses and increase slowly. Monitor for untoward side-effects.
- Be aware of drug-drug interactions between certain antiretroviral and psychotropic medications (particularly SSRIs) (Table 7).
- Be aware of neurological and psychological side-effects of some antiretroviral medications.

1.8.9 Other diagnoses or symptomatology to consider as part of the assessment and management of HIV-positive children and adolescents

1.8.9.1 Suicide

- Definition: deliberate self-harm where the intention is to die.
- A suicide risk assessment is essential in the assessment of all patients with HIV presenting with psychiatric symptoms such as depression, anxiety, psychosis or self-harming behaviour.

- Suicide attempts in children and adolescents may be impulsive and often related to an intercurrent stressor, which may not always be severe. However, the outcome may be fatal.

Suicide risk assessment

High suicide risk is indicated by any one or more of the factors below:

- Previous suicide attempt
- Pre-existing mental illness
- Family history of suicide
- Substance abuse
- Gender (adolescent males are at increased risk of completed suicide; adolescent females make more suicide attempts)

The following may further contribute to risk:

- Stressful life events
- Physical and sexual abuse
- Poor parent-child communication

Management of suicidal ideation

- Assess suicide risk severity.
- Screen for and treat underlying mental illness, especially depression.
- Develop a safety plan in collaboration with the patient and family.
- Consider hospitalisation if assessment indicates high risk.
- Do not discharge without an adequate psychiatric evaluation if high risk.^[7]

1.8.9.2 Management of trauma-related disorders in children and adolescents with HIV

- Psychosocial counselling and support strategies include compassionate early debriefing, family support and psychoeducation.
- Psychotherapy: cognitive behaviour therapy is useful.

Table 7. Commonly used psychotropic medications and their interactions*

Class	Drug	Possible side-effects	Possible drug interactions
SSRIs	Fluoxetine	Headache, nausea/vomiting, behavioural activation	Potential increase in efavirenz levels
	Citalopram	Headache, nausea/vomiting	-
Antipsychotics			
FGAs	Haloperidol	EPSEs (dystonia, tremor, akathisia, cogwheeling, bradykinesia), neuroleptic malignant syndrome	-
SGAs	Risperidone	EPSEs at higher doses, sedation, weight gain, metabolic syndrome	Possible interactions with protease inhibitors
	Olanzapine	Sedation, metabolic syndrome, CVS side-effects	Probable interactions with protease inhibitors
	Clozapine	Best to avoid without specialist support	Probable interactions with protease inhibitors
Mood stabilisers	Lithium carbonate	Toxicity, which may be life threatening	Avoid with tenofovir
	Sodium valproate	Sedation, thrombocytopenia, toxicity	-
	Lamotrigine	Stevens-Johnson syndrome	Possible interactions with protease inhibitors

SSRIs = selective serotonin re-uptake inhibitors; FGAs = first-generation antipsychotics; EPSEs = extrapyramidal side-effects; SGAs = second-generation antipsychotics; CVS = cardiovascular.

* Source: <http://www.druginteractions.org>

- Medication such as SSRIs may be indicated if there is a poor response to treatment or severe symptoms.
- Check for alcohol and substance abuse in older adolescents.
- Refer to specialist care if there is a poor response to treatment.^[8,9]

Post-traumatic stress disorder

- Post-traumatic stress disorder (PTSD) can occur when a person has experienced, witnessed or been confronted with an event that involves actual or threatened death, harm or injury, to themselves or to others, with resultant shock, fear, helplessness or horror.
- The prevalence of PTSD in adolescents living with HIV is not known, but studies report a prevalence range of 15 - 64% in adult samples, suggesting that PTSD may also be common in adolescents.^[9]
- Children may have significant symptoms of PTSD but may not meet full *Diagnostic and Statistical Manual of Mental Disorders* (5th edition) (*DSM-V*) criteria (Table 8), as they may have difficulty verbalising their emotions.

1.8.9.3 Adjustment disorders

- An adjustment disorder is the development of a behavioural or emotional response to an identifiable stressor within 3 months of the stressor, resolving within 6 months of termination of the stressor.
- Patients may present with depressive, anxiety and/or behavioural symptoms but do not meet criteria for depression, anxiety or disruptive behaviour disorders.^[4]
- Treatment for adjustment disorders includes supportive psychotherapy and improving coping mechanisms. Short-term medication may be considered.
- Children and adolescents with HIV in Africa often have multiple psychosocial challenges/stressful life events that make them more emotionally vulnerable and isolated.^[10]
- The effect of the virus is thus compounded by negative life events that further negatively affect neurocognitive development.

Common stressful life events for HIV-positive children

- Ill caregiver who cannot cope with parenting
- Death of caregiver

Table 8. PTSD criteria in children and adolescents

DSM-V criteria	Presentation: preschooler	Presentation: child	Presentation: adolescent
<ul style="list-style-type: none"> • Onset after experiencing or witnessing a serious traumatic event (e.g. rape, assault, accidents) • Symptoms may occur soon after the event or with delayed onset • Symptoms: intrusive memories (reliving, flashbacks, nightmares), hyperarousal (increased startle response, anxiety symptoms), avoidance (avoiding situations that remind of the traumatic event, numbing, feeling of foreshortened future) 	Nightmares, inconsolable crying, repetitive play of traumatic content, regression, e.g. bedwetting	Fearful, repetitive play, traumatic content in drawings, hyperarousal and avoidance of painful stimuli, poor concentration, temper tantrums	Similar to adults

PTSD = posttraumatic stress disorder; DSM-V = *Diagnostic and Statistical Manual of Mental Disorders* (5th edition).

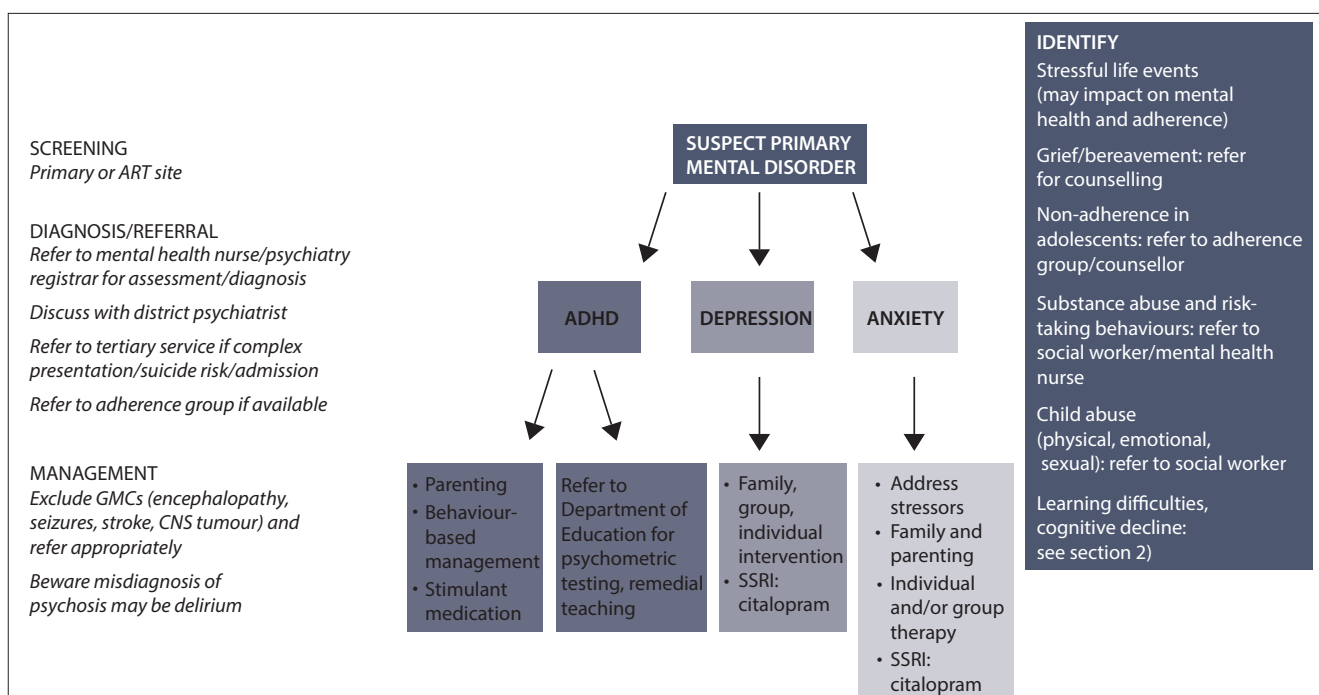


Fig. 1. Recognising primary mental disorders in HIV-positive children and adolescents. (ART = antiretroviral therapy; ADHD = attention deficit hyperactivity disorder; GMCs = general medical conditions; CNS = central nervous system; SSRI = selective serotonin re-uptake inhibitor.)

- Multiple caregivers or child-headed households
- Sick siblings
- Poverty
- Multiple hospital visits
- Disrupted schooling
- Disclosure issues
- Stigma

Grief and bereavement

- Children may lose one or both parents to AIDS and are then often separated from siblings and moved about in an attempt to continue to provide for their basic physical needs.

- These children are often left fearful and anxious or confused.
- In addition, HIV-positive children may have fears about their own mortality.
- It is important that children be allowed to express their grief. Grief reactions are influenced by the child's developmental age and coping mechanisms (Table 9).
- Very young bereaved children may experience regression such as thumb sucking, have nightmares or become clingy. They may also present with acting-out behaviours.
- Bereavement in older children may present with aggressive or impulsive behaviour, poor performance at school,

and/or poor concentration or emotional outbursts.^[11]

- Supportive therapy/counselling at a developmentally appropriate level of the child and family is the mainstay of treatment.

1.8.9.4 The disruptive and aggressive child and adolescent

- A high prevalence of challenging or disruptive behaviours exist in HIV-positive children and adolescents, including ADHD, ADHD-like impulsivity and hyperactivity, aggression, oppositionality and conduct disturbances.^[2]
- However, aggression and disruptive behaviours may arise from medical problems in the child or adolescent, or may be a manifestation of a mood or anxiety-related problem.
- Adolescents in particular struggle with mood and behavioural regulation.
- There is no direct link between HIV itself and disruptive behaviour. Factors such as poverty, prenatal alcohol and drug exposure, malnutrition, family disruption, social chaos and educational deprivation may play a role.

Table 9. Children's developmental stages of grief^[12]

Age (years)	View of death
0 - 2	Very limited but realises person not there
3 - 5	Thinks loved one will return; no concept of finality of death
6 - 8	Curiosity about death; magical thinking
9 - 12	Understands finality and irreversibility of death
13 - 18	Understands finality of death

Table 10. Conduct disorder in children and adolescents

DSM-V criteria	Presentation: child	Presentation: adolescent
Aggression towards people and animals	<ul style="list-style-type: none"> • Aggression 	<ul style="list-style-type: none"> • Serious violation of societal rules; significant risk-taking behaviour
<ul style="list-style-type: none"> • Frequent threats, bullying or intimidation of others • Frequently initiating physical fights • Use of a weapon that can cause serious physical harm to others • Physically cruel to people • Physically cruel to animals • While confronting a victim, has stolen from him/her (e.g. mugging) • Has coerced someone into sexual activity 	<ul style="list-style-type: none"> • Difficulties adhering to rules and age-appropriate expectations • Reluctance to engage positively with authority figures; senseless resistance and/or open hostility and defiance • Bullying • Conflict with peers • Truancy; educational failure 	<ul style="list-style-type: none"> • Promiscuity; early sexual debut • Substance misuse • Mood instability • Serious aggression • Self-destructive (self-harming) behaviour • Move into delinquent and/or criminal behaviour • Negative peer associations • Truancy; educational failure
Destruction of property		
<ul style="list-style-type: none"> • Deliberate engagement in fire setting with the intention of causing serious damage • Deliberate destruction of others' property 		
Deceitfulness or theft		
<ul style="list-style-type: none"> • Housebreaking or breaking into a car or building • Frequently lying to obtain favours or goods to avoid obligations • Theft of items of non-trivial value without confronting a victim 		
Serious violations of rules		
<ul style="list-style-type: none"> • Frequently staying out at night despite parental prohibitions, beginning before the age of 13 years • Has more than once run away from home overnight while living in a parental or parental surrogate home, or once without returning for a lengthy period • Frequently truant from school 		

DSM-V = Diagnostic and Statistical Manual of Mental Disorders (5th edition).

- There is a further association between behaviour disorders and high rates of neurocognitive and neurodevelopmental delay in HIV-positive children.
- Two disorders that require specific consideration are conduct disorder and oppositional defiant disorder.

Conduct disorder

Definition: a repetitive and persistent pattern of behaviour that violates the basic rights of others or where major age-appropriate societal norms or rules are transgressed (Table 10).^[5]

Oppositional defiant disorder

- Definition: a pattern of argumentative/defiant behaviour and angry/irritable mood or vindictiveness lasting at least 6 months.
- Classification requires exhibition of at least four symptoms from any of the categories in Table 11 during an interaction with at least one individual who is not a sibling.^[5]

Common co-occurring disorders in children with disruptive or aggressive behaviour

Aggressive and disruptive behaviour may present with co-occurring difficulties such as:

- ADHD
- Learning disorders and language difficulties
- Intellectual disability
- Anxiety and depressive disorders
- Adjustment disorders
- Substance use disorders
- Trauma-related disorders
- Disruptive mood dysregulation disorder
- Bereavement
- Epilepsy
- Sensory integration difficulties
- Delirium (may be secondary to opportunistic infection or a medication)
- Psychotic disorders

Management of behaviour problems in children and adolescents with HIV

- Explore the family's circumstances, particularly parenting practices and harsh discipline.
- Obtain information from the school and/or recent report cards and any other structures that might be involved with the child or the family (e.g. social services, justice).

- Establish an alliance with the child and his/her parent/caregiver; try not to get drawn into the anger and power struggle that often arises out of the child's behaviour.
- Optimise the management of HIV; ensure adherence to antiretroviral medication, establish extent of health and viral suppression and ensure that no intercurrent opportunistic infections have arisen.
- Manage co-occurring problems. These may be more responsive to treatment and addressing them may improve the behavioural 'dyscontrol', i.e. aggression, impulsivity and risk-taking behaviours.
- Address learning and educational problems. This may necessitate more formal psycho-educational assessment and/or referral to local educational authorities, and may be as simple as establishing contact with the school and its support structures.
- Refer to social services if there are concerns of neglect or maltreatment, child-headed households, poverty, household instability or parental illness.
- Encourage participation in prosocial activities and environments in the local community (e.g. sports and cultural activities).
- Psychotropic medication may prove useful, but is seldom the only solution in addressing behaviour disorders in HIV-positive children. Medications are often more successful in treating comorbid problems, e.g. methylphenidate for ADHD, anticonvulsants (sodium valproate, lamotrigine and carbamazepine) for epilepsy, SSRIs for anxiety and depression.
- Seek supervision and get support from your colleagues; working with these children and their families can be demoralising and frustrating.

Management of conduct disorder and oppositional defiant disorder in HIV-positive children and adolescents

- Assess family functioning and parenting, and establish that the child not been maltreated (physical, emotional or sexual abuse or neglect).
- Refer family to a parenting support group or parenting skills training.
- Refer for individual and/or group psychological intervention, depending on the intellectual capacity of the child or adolescent, his/her capacity to engage in relationship and motivation to participate.
- Risperidone may be useful in reducing aggression and impulsivity, but will need to be carefully monitored for the occurrence of EPSE. A dose of 0.5 - 1 mg/day, with a maximum dose of 1 - 2 mg daily, is recommended. Discuss with a mental health professional if there is a poor response to the maximum dosage.
- Mood stabilisers may be used to aid behavioural management and affective dysregulation associated with behaviour disorders. These should ideally be prescribed by a specialist and monitored carefully.

Table 11. Overview of oppositional defiant disorder

DSM-V criteria	Clinical presentation
<ul style="list-style-type: none"> • Angry/irritable mood • Frequently loses temper • Easily annoyed or touchy • Often resentful and angry • Argumentative/defiant behaviour • Frequently argues with adults and authority figures • Frequently refuses to comply with requests from authority figures or with rules • Frequently deliberately annoys others • Mistakes or misbehaviour frequently blamed on others • Vindictiveness • Spiteful or vindictive at least twice within the last 6 months 	<ul style="list-style-type: none"> • Temper outbursts (sometimes referred to as rage attacks in younger children) • Persistent stubbornness; resistance to directions • Unwillingness to compromise, give in or negotiate with adults or peers • No need to please • Deliberate or persistent testing of limits • Verbal (and minor physical) aggression • Low self-esteem • Mood lability and low frustration tolerance

DSM-V = Diagnostic and Statistical Manual of Mental Disorders (5th edition).

1.8.10 Psychological interventions

1.8.10.1 Psychosocial support for children

- Psychosocial support can be understood as any type of initiative that seeks to protect or promote the well-being of a child or adolescent, and prevent or treat mental health problems.
- It should form part of a broad framework of care that includes the family, parents, school and community, and that encompasses a range of interventions combined to achieve the best possible outcomes. The provision of psychosocial support involves a range of stakeholders: caregivers, family members, teachers, and healthcare providers including psychological and social services.
- Psychosocial support includes the provision of individual counselling, the availability of facility- and community-based support groups, parenting programmes and peer support initiatives, and information and education workshops.^[12]
- To be effective, psychosocial intervention should be tailored to the context and take into account the child's age and stage of development. It is essential that there is focus on enabling an HIV-positive child to establish their identity, manage their care, live positively, cope with challenges and work towards a healthy future.
- HIV-positive children are particularly vulnerable to psychological and social stressors that can affect their development and well-being. Psychosocial support can foster resilience, enabling children and adolescents to bounce back from adverse experiences and to cope better with the multiple stressors related to HIV. Their unique psychosocial needs include assistance to deal with their illness, help to cope with loss and changes of caregiver, and support to overcome isolation associated with stigma and discrimination.^[12-14]

1.8.10.2 Therapeutic support

Psychosocial intervention can take various forms including referral to support groups, psychotherapy or counselling (Table 12).^[15]

1.8.10.3 Psychosocial support for adolescents

- Interventions for adolescents fall into three categories: therapeutic support, youth-centred interventions and those aimed at fostering independence.
- In the case of the former, support groups, counselling and psychotherapy provide support across a broad range of issues (Table 13).^[15]
- Group-based interventions are attractive to the adolescent and are a time- and cost-effective method of delivery.^[15]

1.8.10.4 Benefits of group interventions for adolescents

- Enhance self-knowledge and self-acceptance.
- Empower individuals to make change.
- Help individuals to develop coping skills.
- Build communication skills and help in relationships outside of the group.
- Give individuals freedom to express negative feelings in a safe, non-judgemental environment.
- Provide positive reinforcement and emotional support.
- Provide a platform for education, e.g. adherence to treatment.
- Foster a sense of belonging to counter feelings of isolation and inadequate social support.

1.8.11 Youth-centred interventions

- An important aspect of adolescent service provision is ensuring that it is youth friendly.
- Adolescent and Youth-friendly Service (AYFS) provision has been identified as an important aspect of service delivery in South Africa, and has a strong focus on attracting and retaining young people for ongoing care.
- Adolescents are particularly vulnerable to the harmful outcomes of risk behaviours, e.g. unprotected sex and substance abuse, but tend not to seek early treatment. There are a number of reasons for this, such as worry about stigma or fear of harsh treatment at the clinic.

Table 12. Psychosocial interventions for children

Support groups	Psychotherapy	Counselling
<ul style="list-style-type: none"> • Groups need to be tailored to the child's age and stage of development, e.g. with younger children play can be combined with opportunities to learn about healthy living • Older children can benefit from experiential activities across a range of health-related topics • Useful to allow parents and caregivers to talk about their own fears, frustrations and challenges • Can address difficulties with disclosure. Secrecy can affect the mental health of both child and parent/caregiver • Provides a forum for education, correction of misconceptions and skills building • Useful for building parenting skills that can help caregivers to develop effective communication skills, set limits and discipline appropriately 	<ul style="list-style-type: none"> • Different types of psychotherapy are available to address a wide range of issues ranging from separation anxiety and learning or school problems to excessive shyness and low self-esteem. The choice of therapy will depend on the age and stage of the child's development • In particular, younger children may benefit from play therapy where the use of play materials such as toys and puppets encourage children to talk about their feelings in order to better understand and cope with their difficulties 	<ul style="list-style-type: none"> • The participation of children is an important aspect of counselling but is easily overlooked. Children may also be shut out of conversations because they have not been told their status • Providing the opportunity to talk about matters that concern them with someone who is empathic, supportive and non-judgemental is important • The following counselling approaches may be useful:^[16] <ul style="list-style-type: none"> • Get down to the child's eye level • Speak softly and directly to the child • Smile and play • Be honest and patient • Allow and respect normal emotions • Start with the least invasive activities • Give the child choices, e.g. would s/he like juice or water with medication • Engage the child, e.g. talk about hobbies, friends and so on • Support the parent-child relationship. • Sit close to the child

Table 13. Psychosocial interventions for adolescents

Support groups	Psychotherapy	Counselling
<ul style="list-style-type: none"> • Three main types of groups <ul style="list-style-type: none"> • Educational • Social and emotional support • Peer-led • Cost- and time-effective in a busy clinic • Provide a safe space for young people to talk about personal issues, share similar challenges, discuss aspects of treatment (e.g. adherence), explore coping strategies and build a social network • Can involve novel and interesting ways to achieve a specific goal, e.g. music, dance, drama, art or storytelling groups • Important to understand developmental stage to ensure that groups meet the particular concerns of different age bands, e.g. discussions about puberty (young adolescents), or sexual and reproductive health issues (older adolescents) • Support groups conducted for parents and caregivers are important and provide emotional support for carers, opportunities for discussing parenting challenges and fostering communication skills to build positive family relationships 	<ul style="list-style-type: none"> • The most common types of psychotherapy are cognitive behavioural therapy, and interpersonal and psychodynamic psychotherapy^{17,18]} • Cognitive behavioural therapy uses techniques to correct distortions of thinking that are seen in emotional disorders • Interpersonal psychotherapy is a brief, time-limited treatment based on the premise that depression occurs in the context of relationships. It covers four general areas of difficulty: grief, conflict in significant relationships, difficulties adapting to changes in relationships or life circumstances, and problems stemming from social isolation • Psychodynamic psychotherapy is a 'talk therapy' for adolescents based on understanding issues that are behind a young person's behaviour, thoughts and feelings. Not all young people benefit from this form of therapy and assessment for suitability is required • Other types of psychotherapy include family therapy, which aims to explore patterns of communication in families and to support and educate, and dialectical behaviour therapy, which is useful with older adolescents with chronic suicidal feelings or thoughts 	<ul style="list-style-type: none"> • May involve obtaining advice or exploring a personal or social problem • Positive change more likely in a relationship of trust where confidentiality is maintained. Building trust takes time and is greatly facilitated when the adolescent is able to see the same person at each visit • Different types of counselling include grief, substance abuse and adherence counselling • Adherence counselling is a form of psychosocial support that is concerned with the identification of effective strategies to promote adherence to antiretroviral treatment. Its aim is to enhance the ability of young people to take their treatment as prescribed. It is a process that includes preparation, treatment initiation, consolidation and maintenance

- Paying attention to the health needs of adolescents is crucial. As young people become more independent, they are expected to take more responsibility for their own health. Knowing where and when to get help and feeling confident that they can rely on a service that they trust and feel is there for them is fundamental to a positive outcome.^[16]
- A package of services should be available to meet the diverse needs of young people.
- It is important to address obstacles that commonly inhibit the use of healthcare services by adolescents.

1.8.11.1 Overcoming obstacles to providing AFYS

- Providers should be trained to work competently and respectfully with adolescents.
- Services must be confidential, non-judgemental and private.
- Clinic hours should be convenient for young people, e.g. after school.
- Services should be accessible to all adolescents and young people, irrespective of their age, sexual orientation or marital status.
- An effective referral system should be in place.
- Opportunities should be made available for young people to be involved in the design, implementation and evaluation of the programme.
- Services should seek to involve and gain the support of those important in the lives of young people and in their communities, e.g. partners, parents, school.^[16]

1.8.12 Adherence in adolescents

- Helping adolescents to achieve independence is important particularly for those transitioning to adult services.
- Part of taking increased responsibility for their healthcare involves adhering to the prescribed treatment regimen.

1.8.12.1 Improving adherence in adolescents

- Poor adherence is normal in adolescence, but the risk of drug resistance, limited treatment options, increased viral load and risks to survival mean that adherence needs to be well supported.
- Reasons for poor adherence among adolescents can be categorised into patient, treatment and socioeconomic factors.
- Stressful life events can contribute to poor adherence, as can treatment fatigue, substance abuse and mental health problems such as depression.
- Psychosocial support in the form of counselling, referrals and group participation can help young people who are finding adherence difficult. Counselling provides opportunities to develop jointly a workable treatment plan that includes treatment reminders and takes into account lifestyle issues that have the potential to interfere with adherence if not addressed.
- Ideally, adolescents should know their HIV status. Adolescents who have not been disclosed to will be unable to appreciate the importance of adherence to treatment and are less likely to understand the risks associated with engaging in unprotected sex. This makes status disclosure an important aspect of care and support.^[19]

2. HIV-associated neurocognitive disorders

2.1 Neurocognitive sequelae

- In untreated children, cognitive impairment occurs early and progresses over time, with prevalence rates ranging between 8% and 60%.
- Early invasion of the developing fetal and infant brain is believed to result in the most common primary HIV-related CNS complication, HIV encephalopathy (HIVE), which refers

to the disease, damage or malfunction of the brain caused by HIV. This complication can be present before significant immunosuppression. However, its presence in a child infected with HIV constitutes an AIDS-defining illness, reflecting the severity of the condition.

2.1.1 Prevalence and impact of HIV-associated neurocognitive disorders (HANDs) in children

Prevalence:

- In untreated HIV-positive children, 8 - 60% experience cognitive impairment; disorder occurs early and progresses over time.
- Untreated HIV increases risk of CNS sequelae.^[17,20,21]

Impact:

- A range of cognitive deficits occur, cognitive scores clustering in low average to borderline range for intellectual functioning.
- Although cognitive functioning improves after ART initiation, scores remain lower than population norms, with poorer academic performance and persistence of language (e.g. verbal fluency), memory, processing speed, visuospatial and attention problems or deficits. Remedial educational interventions are important.^[18,22,23]
- Psychosocial stressors (poverty, orphanhood, parental physical/mental illness or loss) negatively affect adherence, educational and mental health outcomes.
- The concept of a milder form of neurocognitive disturbance in HIV-positive children, such as the adult condition of HAND is recognised but is yet to be defined in children and adolescents. This condition may have significant effects in functional terms on a child's learning potential.^[24]
- Many HIV-positive children receiving ART function within normal limits compared with uninfected peers, but a subset with CNS disease follow a distinct pattern of low average cognitive functioning.
- The cognitive deficits in these children may be a result of ongoing viral replication in the brain despite virological control in the periphery or from residual effects of static HIV-1 CNS disease.
- Although HIV-positive children receiving highly active antiretroviral therapy appear to exhibit global measures of intelligence comparable with their uninfected peers, deficits may be present in specific areas such as executive functioning and working memory. Deficits in these areas can impact significantly on learning.
- Children with HAND may demonstrate few clinical signs, but an index of suspicion should be aroused when history reveals delayed motor milestones and when school reports describe school difficulties.

Centers for Disease Control and Prevention: HIV encephalopathy criteria for classification^[25]

Must include at least one of the following for at least 2 months in the absence of a concurrent illness:

- Failure to attain or loss of developmental milestones or loss of intellectual ability, verified by standard developmental scale or neuropsychological tests
- Impaired brain growth or acquired microcephaly evident by head circumference measurements or brain atrophy demonstrated by computed tomography or magnetic resonance imaging; serial imaging is required for children <2 years of age
- Acquired symmetric motor deficit manifested by two or more of the following: paresis, pathological reflexes, ataxia or gait disturbance

2.2 Specific neuropsychological deficits

- Neuropsychological testing reveals that executive functioning deficits might be an early indicator of cognitive problems, with deficits in mental processing, sequential processing, comprehension, memory, visuospatial and time orientation tasks.
- One or more of the following must be met for diagnosis of HAND:
 - A significant drop in cognitive test scores, but generally still above the delayed range, with or without mild brain imaging abnormalities, with no loss of previously acquired skills and no apparent functional deficits (adaptive behaviour and school performance stable)
 - Cognitive test scores in the borderline range, with no significant functional deficits (and no history of significant drop or previous testing)
 - Cognitive test scores within normal limits (low average range or above) with no significant functional deficits and moderate to severe brain imaging abnormalities consistent with HIV-related changes
 - Abnormal neurological findings but not significantly affecting function.^[26]
- Deficits suggestive of frontal lobe dysfunction (e.g. attention, processing speed, motor speed and visuomotor integration) are also detectable in HIV-positive children and adolescents.
- Educational interventions to address these problems are essential to improve the overall health literacy (and adherence) in infected youth as they age and assume greater treatment responsibility.
- Children infected with HIV presenting with cognitive problems may be slow to process information, slow to complete tasks or may be clumsy, and this may affect everyday living. Understanding cognition in children is compounded by the fact that developmental milestones with regard to motor function, co-ordination and the elements of cognition occur at various stages in the development of a child. Screening tools used in adults such as the International HIV Dementia Scale in their current form are thus inappropriate in children and adolescents, as each tool must accommodate the different developmental stages from childhood through to adolescence.

Cognition refers to a group of mental processes that include attention, memory, producing and understanding language, learning, reasoning, problem-solving and decision-making.

2.3 Identification and management of neurocognitive disorders

- Prevention of HIVE, HAND and AIDS-defining conditions via early ART remains the cornerstone of effective management. ART has dramatically decreased the prevalence of HIVE in the US from 35 - 50% to <2%.^[27]
- Furthermore, early initiation of ART results in improved neurodevelopmental outcomes compared with deferred initiation.
- Ensuring adherence and providing treatment support are key factors in management.
- A multidisciplinary, tiered approach is recommended for the management of neurocognitive complications (Table 14).
- Referral for pure neurocognitive decline should immediately be to a paediatrician/physician, according to the age of the child.
- However, concern about contributing mental health/behavioural issues may require psychiatric review.

- If cognitive impairment develops once a child is receiving ART, check viral load and adherence.
- If a child's milestones are deteriorating or if an older child has educational or behaviour problems, and there is no obvious explanation, the child should be referred for further evaluation even if HIV infection is well suppressed.
- Treatable conditions can be diagnosed at a primary healthcare level; routine history, examination and blood tests assist in this regard (Table 15).
- Exclude indirect complications of HIV infection such as opportunistic infections (tuberculous meningitis, cytomegalic virus infection), and intrauterine exposure to alcohol and substances.

Table 14. Management of HIV-positive children at primary, secondary and tertiary care levels

Primary	<ul style="list-style-type: none"> • Document milestones, and measure head circumference at birth, enrolment and 6-monthly thereafter • Monitor growth and nutrition • Actively investigate and manage treatable conditions, e.g. chronic middle ear infection, epilepsy, iron deficiency anaemia • Review copies of school reports, and refer for educational support, if possible • Monitor side-effects of medication, e.g. sleep disturbances • Refer to secondary level healthcare if complicated epilepsy, positive diagnosis of HIVE, or if HAND, attention or behavioural problems are suspected
Secondary	<ul style="list-style-type: none"> • Paediatricians, psychiatrists, physiotherapists, occupational therapists and speech therapists at secondary level must be made available to all primary healthcare workers for up-referral as necessary • Strengthen links between educators (teacher or learning support professionals at the school) and health professionals in order to provide education goals that are realistic and that will ensure the child achieves his/her maximum potential • Refer for screening by specialists to decide if tertiary intervention is required and to manage some of the more complex general medical problems
Tertiary	<ul style="list-style-type: none"> • Refer for assessment by a specialist paediatrician (or developmental paediatrician) • Refer for neuroimaging • Refer to a psychologist for cognitive testing and/or neuropsychological battery (if indicated) • Refer for EEG if indicated • Refer for occupational therapy, audiology, and assessment of language and speech therapy as needed • Referral for audiometry if a language development delay is present

HIVE = HIV encephalopathy; HAND = HIV-associated neurocognitive disorder; EEG = electroencephalography.

Table 15. Medical conditions that may affect cognition^[28,29]

Condition	Diagnosis	Potential effect on cognition	Management
Iron deficiency anaemia	History and full blood count	Attention problems	Iron supplements
Nasal obstruction	History, sleep studies	Learning difficulties and attention problems	Nasal spray, referral to an ENT specialist
Chronic middle ear infection	History and examination	Decreased hearing resulting in learning difficulties	Audiology, referral to an ENT specialist
Visual impairment	History and examination (e.g. use of a Snellen chart for older children and small items such as edible '100s and 1 000s' for young children)	Visuomotor problems and difficulty managing in the classroom	Refer to an optometrist/ophthalmologist as appropriate
Malnutrition	Growth charts	Specific learning difficulties and attention problems	Referral to a dietician, medical follow-up, refer to a nutrition supplementation programme
Efavirenz side-effects	Sleep history and colateral from teacher, may sleep at school, high efavirenz level	Decreased concentration and focus, poor memory	Detailed history, consider lower dose (discuss with a specialist)
Emotional problems	History and behaviour checklists	Cognitive problems, attention problems, poor scholastic performance	Refer to a psychiatric service

ENT = ear, nose and throat.

- Identify environmental and socioeconomic deprivation (orphans, poverty, malnutrition), as this may further affect cognition.
- If other factors (e.g. behavioural, acute illness, other infection) may *possibly* explain the drop in scores or low cognitive functioning, do *not* classify as HAND or encephalopathy; re-evaluate at a later stage.

2.3.1 Screening tools to detect neurocognitive impairment

- No international validated screening tools are available to test HIV-positive children for neurocognitive impairment.
- However, screening tools can be helpful in identifying children at risk for developmental problems. Examples of simple tools that can be used are available to download online (<http://www.sahivsoc.org/topics?page=1¤tFilter=Mental%20Health>). These include a tool for children younger than 5 years and another for schoolgoing children. These tools have not been validated, but together with the Road to Health Developmental Check List (RTHDCL) may provide local tools for use at primary and secondary level care.
- We recommend that all children be screened 6-monthly and more formally at 3 - 4 years and again at 5 - 6 years. This, together with the RTHDCL, should enable flagging of children with potential problems. Early detection of problems paves the way for interventions that would improve the quality of life of these children.
- Screening should occur in the context of general HIV clinics across all levels of healthcare.
- Screening needs to include a history, formal systemic examination and particularly a neurological examination (at least head circumference and motor examination, deep tendon reflexes and gait assessment).
- Any child with delayed developmental milestones should be referred for further assessment.
- It is important to identify contributing factors that can be managed, e.g. nutritional, emotional, poverty and deprivation factors, among others.

Conflict of interest. All expert panel members have completed and submitted conflict of interest disclosure statements. Disclosure information represents the previous 3 years (updated 3 September 2014) and includes relationships with pharmaceutical companies and medical aids: A Lachman reports receiving honoraria from Cipla Medpro and Lilly for speaking engagements; R Nassen reports receiving an honorarium from AstraZeneca for a speaking engagement. All other panel members report no conflict of interest.

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