

## Mental Health and Neurocognitive Screening

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# Learning Objective

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At the conclusion of this presentation, learners should be better able to **Screen** for:

- Psychiatric
- Substance use
- Neurocognitive disorders

among adults living with HIV and AIDS

# Neurocognitive and Psychiatric signs & symptoms

**Look for underlying biological cause – differential diagnoses**

1. Medications side effects: HIV, psychiatric, other; interactions
2. Substances: Alcohol, drugs, herbal, over-the-counter, other
3. Non-HIV medical problems (e.g. HCV neurocognitive illness, dementias, thyroid disease, syphilis)
4. HIV-related illnesses:
  - CNS lesions or infections (OI, PML, IRIS, Lymphoma)
  - Non-CNS illnesses (e.g. hypogonadism)
5. Cerebrovascular disease
6. Sleep Disorders

**HAND**

**Psychiatric syndromes**

**Psychosocial issues**

+/-

HCV: Hepatitis C Virus

CNS: Central Nervous System

OI: Opportunistic Infections

PML: Progressive Multifocal Leukoencephalopathy

IRIS: Immune reconstitution inflammatory syndrome

# HIV-associated neurocognitive disorders

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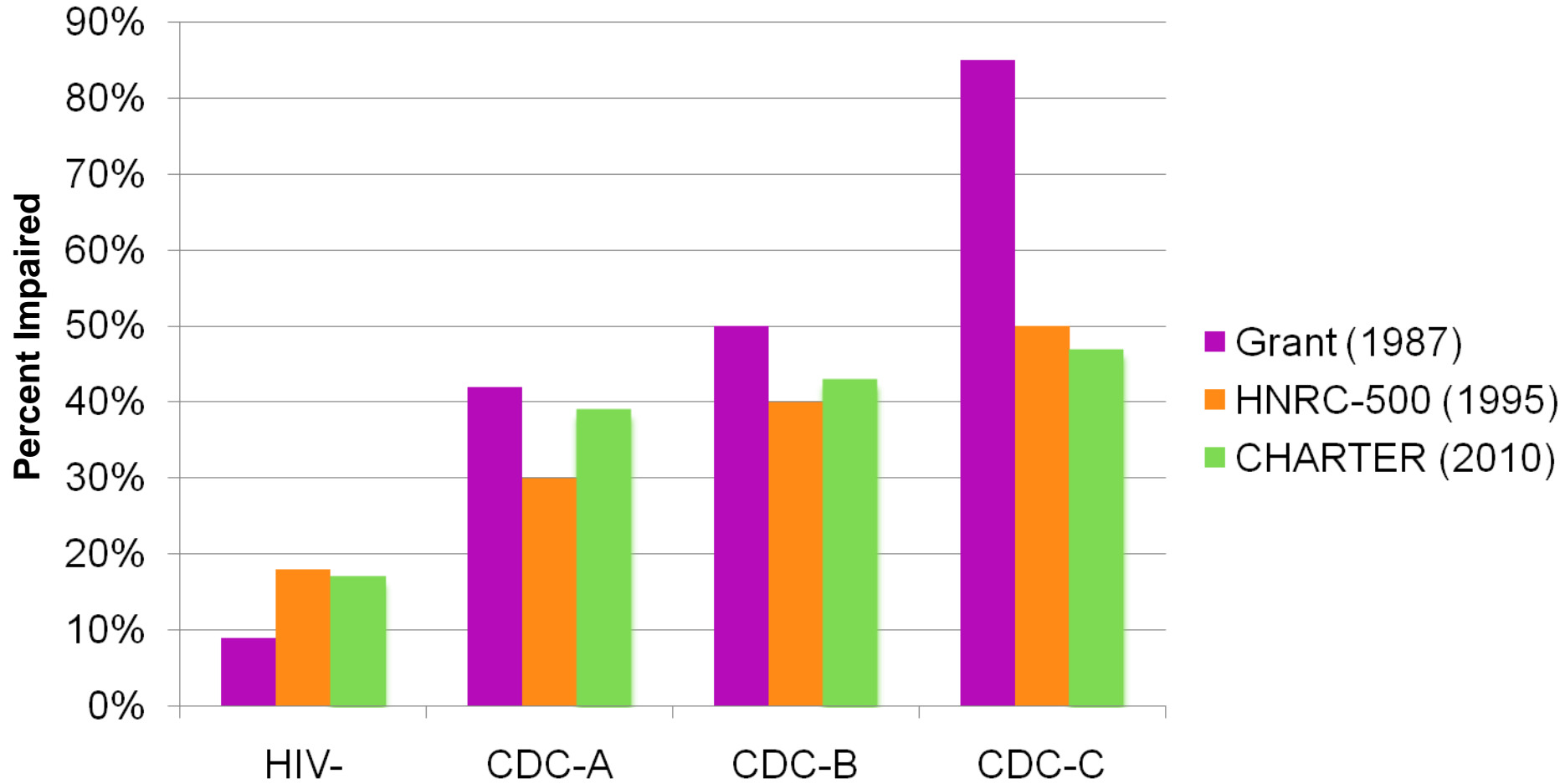
**(HAND)**

# HIV-associated neurocognitive disorders (HAND)

<b>HIV associated neurocognitive dysfunction*</b>	
Asymptomatic neurocognitive impairment (ANI) (30%)	<ul style="list-style-type: none"><li>• Impairment in <math>\geq 2</math> neurocognitive domains (<math>\geq 1</math> SD)</li><li>• Does not interfere with daily functioning</li></ul>
Mild neurocognitive disorder (MND) (20-30%)	<ul style="list-style-type: none"><li>• Involves at least 2 neurocognitive domains (<math>\geq 1</math> SD)</li><li>• Mild–moderate interference in daily functioning</li></ul>
HIV-associated dementia (HAD) (2-8%)	<ul style="list-style-type: none"><li>• Marked impairment in <math>\geq 2</math> neurocognitive domains (<math>\geq 2</math> SD)</li><li>• Marked interference in daily functioning</li></ul>

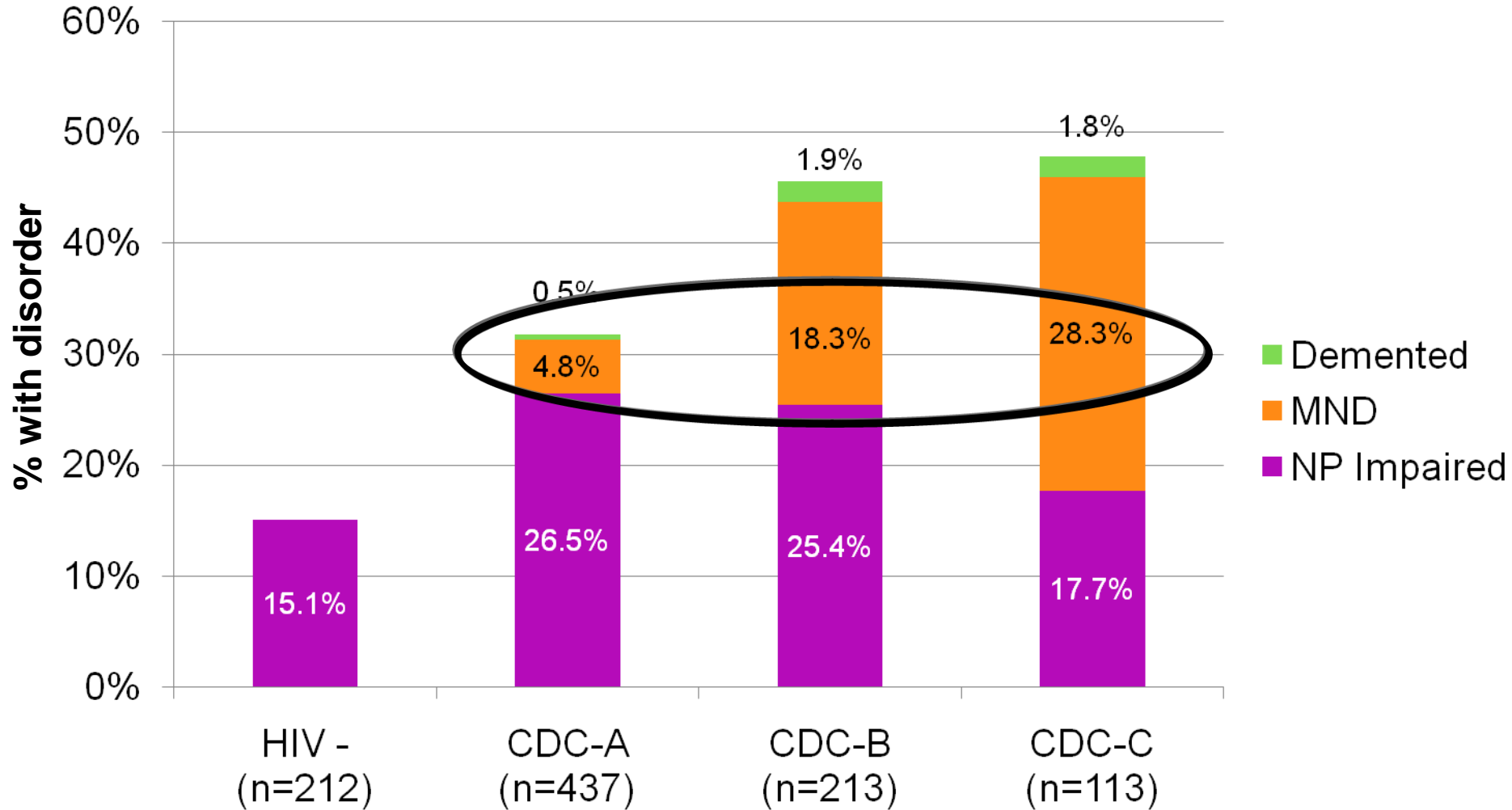
**\*No evidence of other cause**

# Combination antivirals prolong survival but HAND remains prevalent



Grant I et al. Ann Intern Med 1987  
Heaton RK et al. J Int Neuropsychol Soc 1995  
Heaton RK et al Neurology 2010

# Prevalence of HAND by stage of HIV disease



NP = neuropsychologically impaired  
MND = mild neurocognitive disorder

Heaton et al J Int Neuropsychol Soc 1995  
Courtesy of I. Grant; HNRP

# Clinical Presentation of HIV-CNS

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- Subcortical dementing process
  - Mood disturbance
    - Apathy > depression
  - Motor impairment
    - Increased reflexes, rigidity
  - Mentation
    - Cognitive disturbance

# HIV-1-Associated Dementia

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- Acquired abnormality in at least two of the following cognitive abilities for at least one month:
  - Attention/concentration
  - Speed of information processing
  - Abstraction/reasoning
  - Visuospatial skill
  - Memory/learning
  - Speech/language

# HIV-1-Associated Dementia (continued)

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- At least one of the following:
  - **Acquired abnormality in motor function**
  - Decline in motivation or emotional control or change in behavior
- Absence of clouding of consciousness (delirium)
- No evidence of another etiology

# Mild Neurocognitive Disorder

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- Two or more of the following for  $\geq$  1 month:
  - Impaired attention or concentration
  - Mental slowing
  - Impaired memory
  - Slowed movements
  - Incoordination
  - Personality change, irritability or emotional lability

# Mild Neurocognitive Disorder (continued)

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- Symptoms must be verified by neuro-exam
  - Slowing of saccades
  - Hyper-reflexia & ataxia
  - Frontal release signs
  - Slowing of rapid alternating movements
- Must be accompanied by mild impairment of functional status (eg, work or activities of daily living)
- No evidence of another etiology for symptoms

# Mild Neurocognitive Disorder Morbidity

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- Increased unemployment
- Decreased quality of life
- Decreased medication adherence
- Subjective perception of diminished work performance
- **Decreased survival**

# Neurocognitive disorders in HIV

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## **Neurocognitive disorders, especially MND\* are:**

- Common
  - Even when patients are otherwise well controlled (e.g. stable ARV regimen, undetectable VL)
  - HAND prevalence has not decreased as much as in other CNS HIV-related illnesses since ARVs
- Under-diagnosed
- Under-treated
  - No consistent diagnostics or therapeutics have entered clinical practice
- Can co-exist with other Mental Health Disorders and can be confused with depression

\*MND = mild neurocognitive disorder

# Why is assessment, diagnosis and treatment of neurocognitive illness important in HIV?

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- HIV invades the brain soon after infection and may cause neurocognitive and psychiatric complications
- Symptoms resembling neurocognitive illness may be signs of HIV infection and progression
- Comorbid conditions (e.g. HCV co-infection) and the effects of aging are more common and impact brain injury
- **Do we consider HAND when starting or changing an ARV regimen?**
- Mental illness is under-diagnosed and undertreated
  - Increases HIV transmission
  - Decreases adherence
  - Worsens prognosis (increases mortality)

# Why is assessment, diagnosis and treatment of neurocognitive illness important in HIV?

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**Fully addressing neurocognitive and psychiatric problems is vital for optimum adherence to treatment, quality of life and prognosis**

- Mental illness is under-diagnosed and undertreated
  - Increases HIV transmission
  - Decreases adherence
  - Worsens prognosis (increases mortality)

# Neurocognitive complications of Hepatitis C (HCV) infection

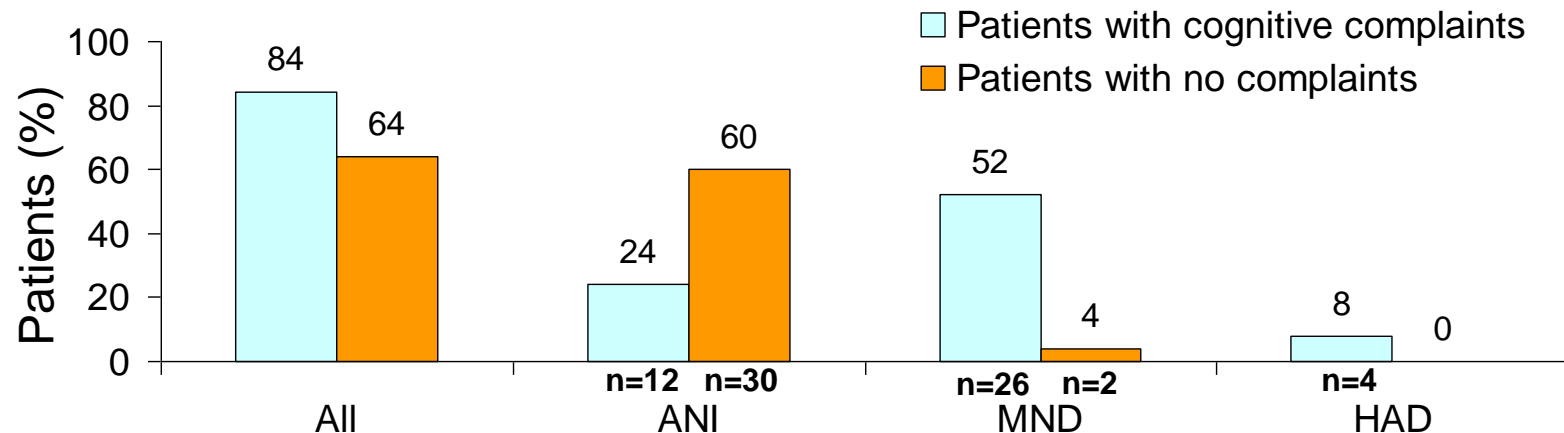
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- HCV infection is a leading cause of non-AIDS-related mortality among HIV patients<sup>1</sup>
  - Out of 78,000 HIV-infected patients, 11% of deaths observed were caused by HCV<sup>2</sup>
- There is some evidence that HCV is neurotropic and replicates in the CNS<sup>3</sup>
- HCV is associated with cognitive impairment, even in the absence of liver failure<sup>4</sup>

1. Vellozzi C, et al. Journal of Viral Hepatitis 2010;;  
2. Lewden C, et al. JAIDS 2008;48:590–598; 3. Laskus T, AIDS 2005; 19(3): S140-44;  
4. Forton DM, et al. Hepatology 2002;35:433–439.

# Prevalence of HAND is high even in patients with long-standing viral suppression

- Patients (N=200) had undetectable HIV-1 RNA concentrations for a median time of 48 months (range 3.2–136.6 months)
- Prevalence of neurocognitive complaints was 27% (N=54)
- After neuropsychological testing, the prevalence of HAND was high even in patients with no cognitive complaints (64%); 84% among complainers



ANI=asymptomatic neurocognitive impairment  
MND=minor neurocognitive disorder  
HAD=HIV-associated dementia

# Changes in HIV dementia with HAART

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- Before HAART: 'Sub-cortical'
  - Apathy and severe psychomotor slowing, memory loss
- After HAART: Mixed 'cortical and subcortical'
  - Milder presentations, frequent transitions and reversals

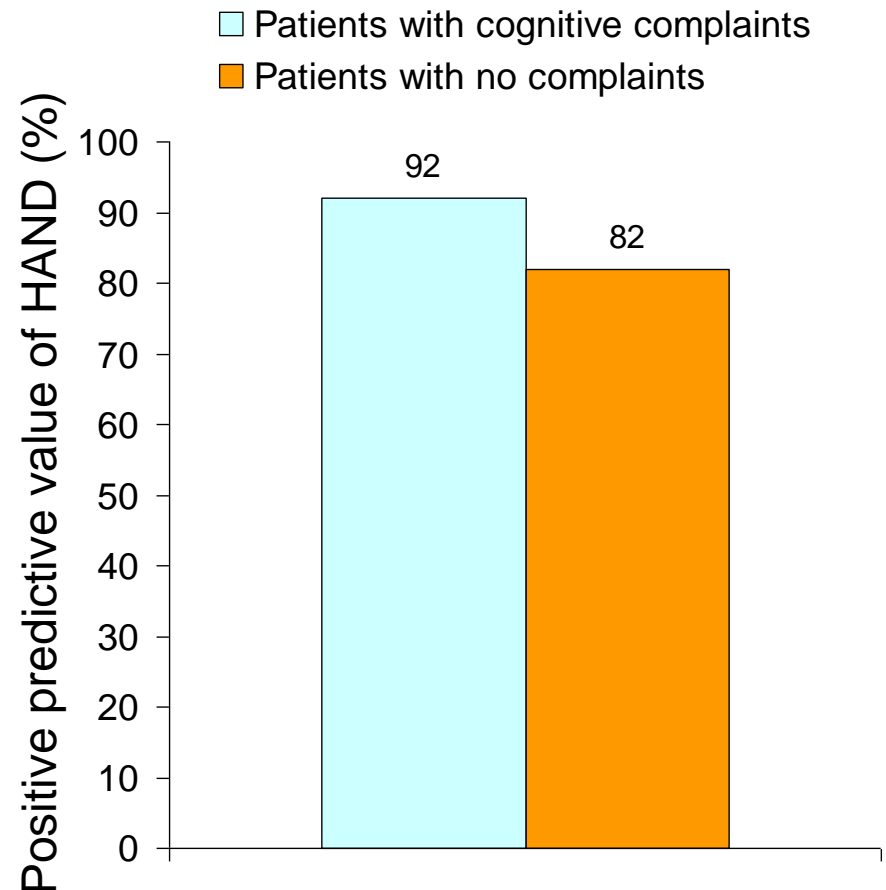
# Evaluation – diagnosis of exclusion

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- The diagnosis is based on clinical criteria after ruling out medical and other causes
- An initial screening includes:
  - Labs: Complete blood counts, electrolytes, creatinine, BUN, glucose
    - Thyroid function tests (TSH, T4)
    - Syphilis (RPR)
    - Vitamin B12 and folate levels
    - Testosterone (both in men and women)
    - Other tests as suggested by history and physical examination
  - Neuropsychological testing
  - Brain Imaging studies and LP may follow

# Neurocognitive assessment: HIV dementia scale can predict for HAND

- Prevalence of neurocognitive complaints was 27% (N=200)
- A score of  $\leq 14$  points on the HIV dementia scale (HDS) yielded a positive predictive value of HAND
  - HDS 0-16; the lower the worst
  - HDS requires training



# Modified HIV Dementia Scale (MHDS)\*

<b>Max Score</b>	<b>Score</b>	<b><u>Memory-Registration</u></b> : Give four words to recall ( <b>dog, hat, green, peach</b> ); give 1 second to say each. Then ask the patient all 4 after you have said them. ( <b>No score for this item</b> )
<b>6</b>		<b><u>Psychomotor Speed (PS)</u></b> : Ask the patient to write the alphabet in upper case letters horizontally across a sheet of paper and record time in seconds. (<21 sec = <b>6</b> ; 21.1 - 24 sec = <b>5</b> ; 24.1 - 27 sec = <b>4</b> ; 27.1 - 30 sec = <b>3</b> ; 30.1 – 33 sec = <b>2</b> ; 33.1 – 36 sec = <b>1</b> ; >36 sec = <b>0</b> ) (Alternative - <b>Coin Rotation Test - CRT</b> )**
<b>4</b>		<b><u>Memory – Recall</u></b> : Ask for the four words from Registration above. Give one point for each correct. For words not recalled, prompt with a "semantic" clue, as follows: animal (dog), piece of clothing (hat), color (green), fruit (peach). (Give ½ point for each correct after prompting)
<b>2</b>		<b><u>Construction</u></b> : Ask the patient to copy a cube; record time in seconds. (<25 sec = <b>2</b> ; 25 – 35 sec = <b>1</b> ; >35 sec = <b>0</b> )
<b>Total Score</b>	<b>/12</b>	<b>(8 or above = normal; 7 or below = impaired)</b>

\* Skolasky et al. J Neurovirol 1998

\*\* Minor KS et al. J Acquir Immune Defic Syndr, 2010

# International HIV Dementia Scale (IHDS)

Max Score	Score	<p><b><u>Memory-Registration</u></b>: Give four words to recall (<b>dog, hat, bean, red</b>); give 1 second to say each. Then ask the patient all 4 after you have said them. Repeat words if the patient does not recall them. Tell the patient you will ask for recall a bit later. (<b>No score for this item</b>).</p>
4		<p><b><u>Motor Speed</u></b>: Have the patient tap the first 2 fingers of the non-dominant hand as widely and as quickly as possible. Count the number of taps in 5 seconds (15 taps = 4; 11-14 taps = 3; 7-10 taps = 2; 3-6 taps = 1; 0-2 taps = 0)</p>
4		<p><b><u>Psychomotor Speed</u></b>: Have the patient perform the following movement with the non-dominant hand as quickly as possible: 1) Clench hand in fist on flat surface. 2) Put hand flat on surface with palm down. 3) Put hand perpendicular to the flat surface on the side of the 5<sup>th</sup> digit. Demonstrate and have the patient perform twice for practice. Count # of sequences in 10 seconds. (4 sequences=4; 3 sequences 3; 2 sequences=2; 1 sequence=1; unable=0)</p>
4		<p><b><u>Memory – Recall</u></b>: Ask for the four words. For words not recalled, prompt with a "semantic" clue, as follows: animal (dog), piece of clothing (hat), vegetable (bean); color (red). (1 point for each correct recall. Give ½ point for each correct after prompting)</p>
<b>Total Score</b>	<b>/12</b>	<p>(≤ 10 = evaluate for dementia* (≤ 11 = evaluate for MND)**</p>

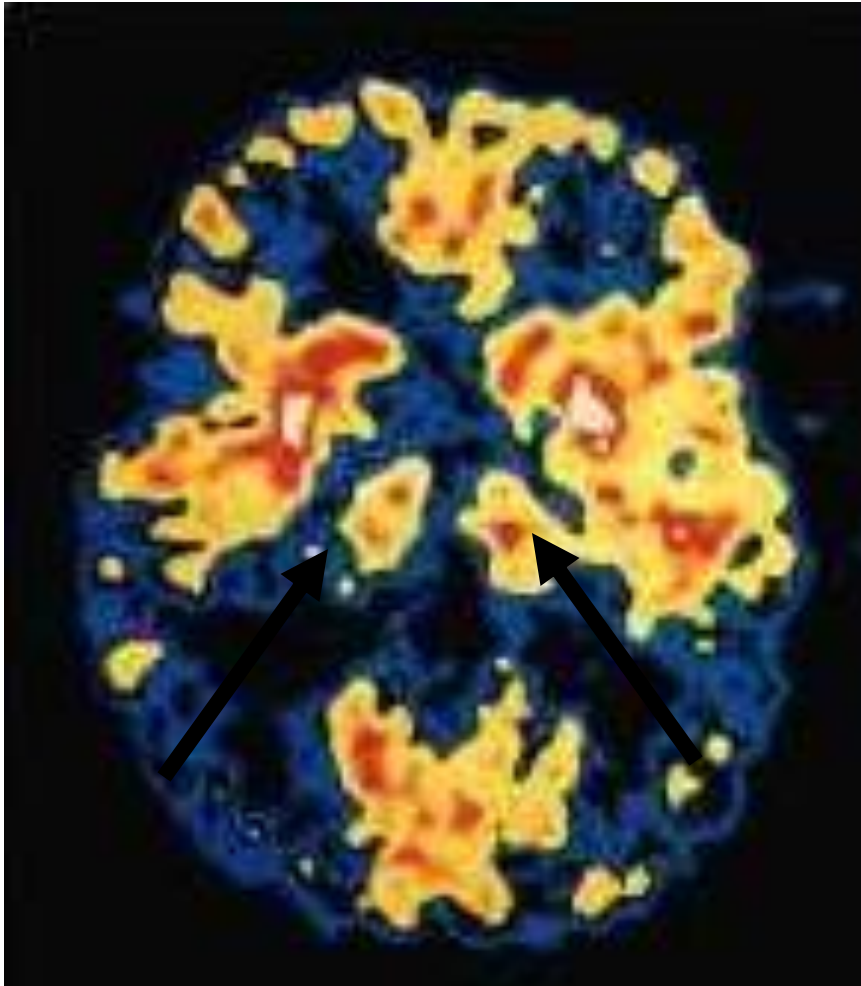
\*Sacktor, et al. AIDS. 2005: HAD sensitivity and specificity: US -80% and 57%; Uganda-80% and 55%

\*\*Joska et al. AIDS Patient Care 2011: sensitivity and specificity: SA-72% and 46%

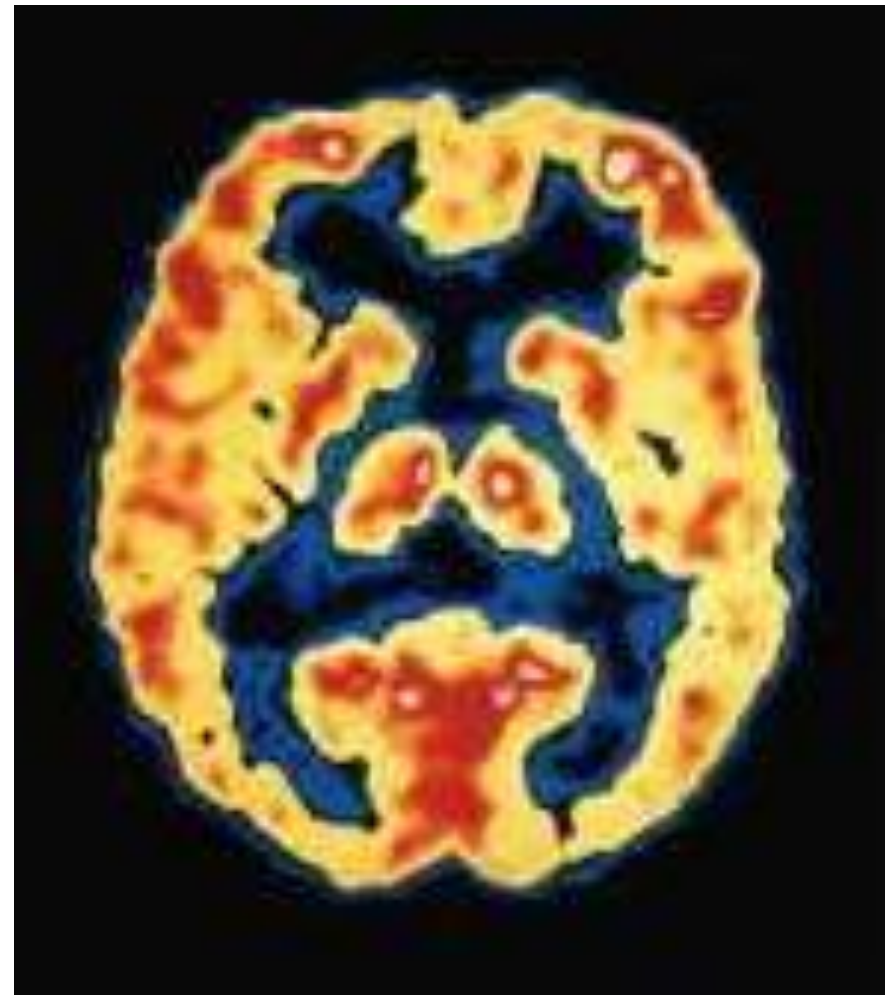
# Neuroimaging: Pre- and Post-Rx

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HAD



HAD-ZDV



# Is it time to introduce routine neurocognitive monitoring into HIV care?

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## **European AIDS Clinical Society (EACS) recommendations:**

- Patients experiencing disturbances in neurocognitive function should be evaluated extensively
  - Including neurological examination, neuropsychological assessment, cerebrospinal examination and brain imaging
- Patients should be targeted for neurocognitive screening if they have one or more of the following:
  - Detectable plasma HIV RNA
  - A low CD4 nadir
  - Ongoing depression
  - Are being treated with ARV therapy that has limited CNS penetration

# Suggested interventions once neurocognitive impairment is detected

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## **European AIDS Clinical Society (EACS) recommendations:**

- If patient is not on ARV therapy consider:
  - Initiation of ARV therapy in which  $\geq 2$  drugs penetrate the CNS
  - Risk for ARV resistance if prior virological failure
  
- If patient is already on ARV therapy consider:
  - Changing ARV to active drugs with better CNS penetration
  - Consider genotyping of plasma and CSF HIV RNA whenever feasible prior to changing ART

# Psychiatric Disorders

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# Psychiatric Disorders

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- Psychiatric disorders are common with Individual living with HIV/AIDS
  - 50% Mood and/or Anxiety disorder
  - 25% Current Substance abuse or dependence (Disorder)
  - 26% Personality Disorder
  - 10.4% PTSD: 38% among women; 50% among African American women (Myers, 1999)
- Untreated psychiatric disorders are linked to slower rates of virologic suppression and treatment (Pence et al 2007)
- Treatment of Psychiatric disorders is associated with
  - Slower disease progression and mortality (Belanoff 2005)
  - Improved treatment adherence (Wyatt 2004)
  - Decrease in HIV transmission risk behavior (Sikkema 2008, Wyatt 2004)
  - Improved quality of life (Sikkema 2005)

# When to Screen

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- At intake (first presentation)
- At annual mental health assessment
- Whenever patient presentation indicates need at any regularly scheduled visit

# Substance Abuse and Mental Illness Symptoms Screener (SAMISS)

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- Can be conducted by a lay person with no formal training in mental health assessment
  - Comprehensive, easy to administer (i.e., short: <10 min)
- Designed to assess for co-occurring disorders
  - Major Depressive Disorder
  - Generalized Anxiety Disorder
  - Panic Disorder
  - Posttraumatic Stress Disorder
  - Adjustment Disorders
  - Substance Use Disorders

# SAMISS and HIV

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- Validated with HIV infected patients at various stages of HIV Illness, including all genders and ethnic backgrounds
- **Substance Abuse:**
  - Sensitivity: 86% (95% CI: 68%-97%);
  - Specificity: 75% (95% CI: 66%-82%)
- **Mental Illness:**
  - Sensitivity: 95% (95% CI: 86%-99%);
  - Specificity: 49% (95% CI: 38%-60%)

# SAMISS

## Q1-3 look at alcohol use (Simial to AUDIT\*)

**1. How often do you have a drink containing alcohol?**

*Never (0); Monthly or less (1); 2-4 times/m (2); 2-3 times/w (3); 4+ times/w (4)*

**2. How many drinks do you have on a typical day when you are drinking?**

*None (0); 1 or 2 (1); 3 or 4 (2); 5 or 6 (3); 7-9 (4); 10 or more (5)*

**3. How often do you have 4 or more drinks on one occasion?**

*Never (0); Less than monthly (1); Monthly (2); Weekly (3); Daily or almost daily (4)*

**Total for Q1-3: \_\_\_\_\_ (Note: score of 5+ indicates positive screening)**

# SAMISS

## Q4-5 look at substances use other than alcohol

**4. In the past year, how often did you use nonprescription drugs to get high or change the way you feel?**

*Never (0); Less than monthly (1); Monthly (2); Weekly(3); Daily or almost daily (4)*

*Total for Q4: \_\_\_\_\_ (Note: score of 3+ indicates positive screening)*

**5. In the past year, how often did you use drugs prescribed to you or someone else to get high or change the way you feel?**

*Never (0); Less than monthly (1); Monthly (2); Weekly(3); Daily or almost daily (4)*

*Total for Q5: \_\_\_\_\_ (Note: score of 3+ indicates positive screening)*

# SAMISS

## Q6-7 look at the effects of substance use on daily living

**6. In the past year, how often did you drink or use drugs more than you meant to?**

*Never (0); Less than monthly (1); Monthly (2); Weekly(3); Daily or almost daily (4)*

**Total for Q6: \_\_\_\_\_ (Note: score of 1+ indicates positive screening)**

**7. How often did you feel you wanted or needed to cut down on your drinking or drug use in the past year, and were not able to?**

*Never (0); Less than monthly (1); Monthly (2); Weekly(3); Daily or almost daily (4)*

**Total for Q7: \_\_\_\_\_ (Note: score of 1+ indicates positive screening)**

# SAMISS

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**Q8-16 (Note: Yes response for any indicates positive screening)**

**(Q8. Mania)**

**8. In the past year, when not high or intoxicated, did you ever feel extremely energetic or irritable and more talkative than usual?**

Yes – No

**(Q9-11. Depression)**

**9. In the past year, were you ever on medication or antidepressants for depression or nerve problems?**

Yes – No

**10. In the past year, was there ever a time when you felt sad, blue, or depressed for more than two weeks in a row?**

Yes – No

**11. In the past year, was there ever a time lasting more than 2 weeks when you lost interest in most things like hobbies, work, or activities that usually give you pleasure?**

Yes – No

# SAMISS

**Q8-16 (Note: Yes response for any indicates positive screening)**

**(Q12-14. Anxiety)**

**12. In the past year, did you ever have a period lasting more than one month when most of the time you felt worried and anxious?**

*Yes – No*

**13. In the past year, did you have a spell or an attack when all of the sudden you felt frightened, anxious, or very uneasy when most people would not be afraid or anxious?**

*Yes – No*

**14. In the past year, did you ever have a spell or an attack when for no reason your heart suddenly started to race, you felt faint, or you couldn't catch your breath?**

*Yes – No*

*If yes, please explain: \_\_\_\_\_*

# SAMISS

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**Q8-16 (Note: Yes response for any indicates positive screening)**

**(Q15. Post Traumatic Stress disorder - PTSD)**

**15. During your lifetime, as a child or adult, have you experienced or witnessed traumatic event(s) that involved harm to yourself or to others?**

Yes – No

*If yes: In the past year, have you been troubled by flashbacks, nightmares, or thoughts of the trauma? (yes/no)*

**(Q16. relevant for a few diagnosis, PTSD or depression)**

**16. In the past 3 months, have you experienced any event(s) or received information that was so upsetting that it affected how you cope with everyday life?**

Yes – No

# Depression

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- Mood disorders are the most frequent psychiatric complication associated with HIV disease
  - Depression significantly worsens ARV adherence and HIV viral control. Compliant SSRI use is associated with improved HIV adherence and laboratory parameters
  - Those with symptomatic HIV disease are more likely to experience a major depressive episode than asymptomatic HIV+ and HIV- individuals
  - Multiple effective therapeutic strategies are available
- Suicide risk is elevated across the trajectory of HIV disease

# Prevalence of Depression

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- Current Disorder
  - Major Depression: 29 – 36%
- Lifetime Disorder
  - Major Depression: 58%
  - Depression can be the silent killer associated with HIV treatment failure

# Depressive Episode Symptoms 5+

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Over the last 2 weeks:

- Depressed mood
- Loss of pleasure
- Weight loss (5%)
- Insomnia/
- Hypersomnia
- Psychomotor agitation/retardation
- Fatigue
- Thoughts of suicide
- Worthlessness/guilt
- Poor concentration
- Recurrent thoughts of death
- Significant impairment
- Rule out other causes

# The PHQ-9 Screening Tool

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- Specifically designed to assist primary care clinicians in diagnosing depression as well as screening and monitoring treatment.
  - Screening alone though PHQ-2
- Can be completed by patients 18+, and takes between 5-10 minutes to complete.
- The interview can also be conducted by a lay interviewer with no formal training in mental health assessment
- Based on the PRIME-MD (Spitzer et al), a mental health screener developed for primary care settings.
- Can be completed at baseline and every two weeks, to track treatment progress

# PHQ-9 (continued)

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- Two components: Assessing symptoms and functional impairment to make tentative depression diagnosis, and deriving a severity score to help
  - Select treatment
  - Monitor treatment.
- Reliable and valid measure based directly on the diagnostic criteria for Major Depressive Disorder in the fourth edition of the Diagnostic and Statistical Manual (DSM-IV)
- Screens for
  - Major Depressive Disorder
  - Other Depressive Disorders (i.e. Dysthymic Disorder)

Over the <i>last 2 weeks</i> , how often have you been bothered by any of the following problems? (use “✓” to indicate your answer)	Not at all	Sever al Days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things*	0	1	2	3
2. Feeling down, depressed, or hopeless*	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
*At least one of the first two items must be endorsed for diagnosis of depression. (PHQ-2)	Add	+ _____	+ _____	+ _____
	= Total Score _____			
10. If you checked off any problems, how difficult have these problems made it for you to do work, take care of things at home, or get along with others?	Not at all difficult _____ Somewhat difficult _____ Very difficult _____ Extremely difficult _____			

# Scoring the PHQ-9

Score	Provisional Dx	Treatment recommendations
0-4	No depression	
5-9	Minimal Symptoms*	Support, call if worse, return in 1 month
10-14	Minor depression**	Support, watchful waiting
	Dysthymia	Antidepressant or Therapy
	Major depression, mild	Antidepressant or Therapy – Manualized Evidence Based Therapies***
15-19	Major depression, moderate	Antidepressant or Therapy
≥ 20	Major depression, severe	Antidepressant <u>and</u> Therapy

\* If more than two years – warrants treatment

\*\* If more than 1 month with functional impairment – consider active treatment

\*\*\* Interpersonal Therapy, Cognitive Behavioral Therapy, Behavioral Activation, Problem Solving Therapy

# PHQ-9 or SAMISS Instrument

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## SAMISS

### HIV Resource Group

- <http://www.hivresourcegroup.org/docs/HCMUpdate/17SAMISStool.pdf>

## PHQ-9

### The MacArthur Initiative on Depression & Primary Care

- <http://www.depression-primarycare.org/clinicians/toolkits/materials/>

Thanks!

