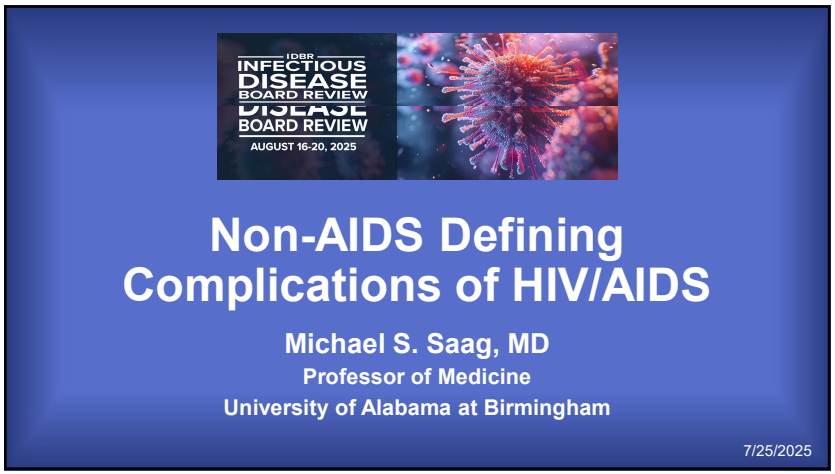
42 Non-AIDS-Defining Complications of HIV/AIDS
Speaker: Michael Saag, MD



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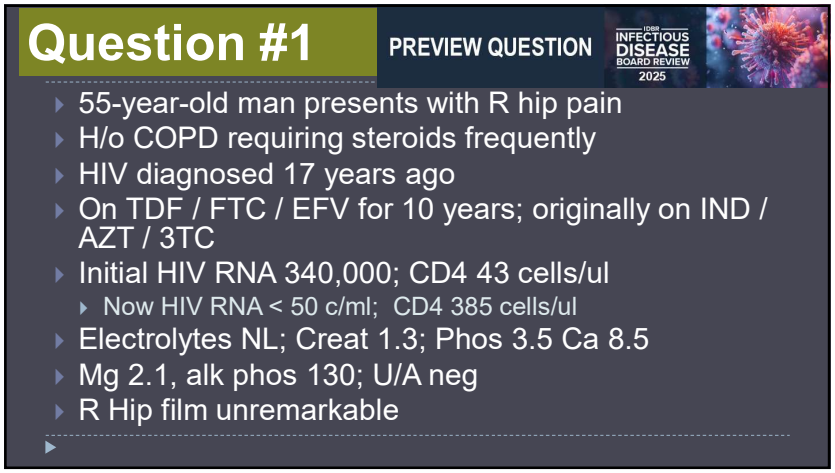

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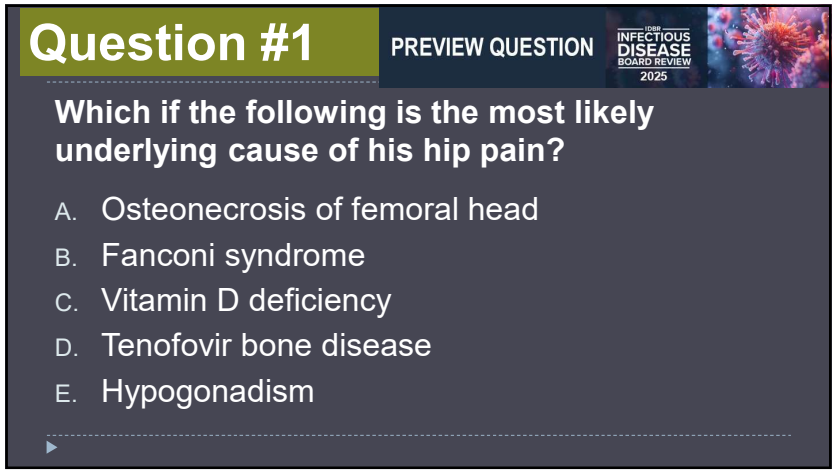

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Question #1

PREVIEW QUESTION

Which if the following is the most likely underlying cause of his hip pain?

A. **Osteonecrosis of femoral head ***
B. Fanconi syndrome
C. Vitamin D deficiency
D. Tenofovir bone disease
E. Hypogonadism

5

Question #1

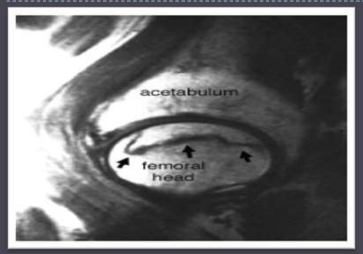
PREVIEW QUESTION

Which of the following is the most likely underlying cause of his hip fracture?

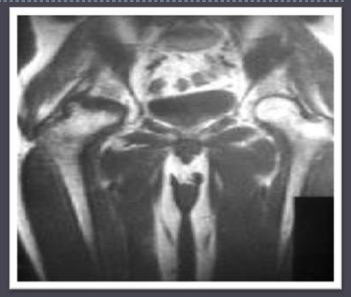
A. **Osteonecrosis of femoral head: Prior steroid / PI use ***
B. Fanconi syndrome: Assoc with TDF; but Phos, creat, and U/A nl.
C. Vitamin D deficiency: VERY common; often overlooked. Leads to osteoporosis / malacia/ fx
D. Tenofovir bone disease: Happens, but rare. Occurs in unusual places (1st rib).
E. Hypogonadism: Could be a contributing factor, but Vit D deficiency much more common cause of Fx

6

Osteonecrosis



This image demonstrates a classic segmental area of osteonecrosis with a dark line denoting the border between dead bone and living bone.



M. Levine. Osteonecrosis of the hip- emedicine.com

7

Avascular Necrosis in HIV

- Reported prior to the HAART era; increasing in HAART era
- Rates of AVN 4.8/1000 person years >> general population
  - Age ~ 35 yrs
  - Male predominance
  - H/o IDU
  - Increased duration of HIV
  - Low CD4
  - Elevated lipids
  - Glucocorticoid steroid use
  - Alcohol use

Monier et al, CID 2000;31:1488-92, Moore et al, AIDS 2003

8

Question #2

- 46-year-old f c/o (CD4 582, VL <50 c/ml) c/1-weekek cramps in calves, tingling in hands, feet
- Today awoke and can't move except hands/feet
- No F/C, chest pain, SOB, incontinence
- + chronic diarrhea 4x/day
- Chronic fatigue, poor appetite
- Meds
  - TDF/FTC/EFV (2008), on TDF/FTC/Elv/cobi since 2014
  - Zoloft, buproprion, norco, prilosec, trazodone, pravachol ibuprofen

9

Question #2

- VS: T 98.2 P 79 BP 112/73
- RR 16, 02 sat 97%
- Pertinent findings
- Neuro: CNII-XII intact, strength 1+ all extremities except 4+ hand/wrist and ankles
- NI reflexes. Alert, oriented

10

Question #2

137|116|5 Gluc 83
1.6 |18 |1.0 AG 3

Ca 8.3 Phos 1.8 Mg 2.1
Lactate 1.5 CK 186
UDS +cocaine/benzo/opiate
UA: 1.015 pH 6.5 2+ pro
Neg: gluc/ketones

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Question #2

Which of the following is the most likely diagnosis?

A. Cocaine toxicity
B. Nucleoside-induced myopathy (ragged red fiber disease)
C. Serotonin syndrome
D. Statin toxicity
E. Fanconi syndrome

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Question #2

Which of the following is the most likely diagnosis?

A. Cocaine toxicity
B. Nucleoside-induced myopathy (ragged red fiber disease)
C. Serotonin syndrome
D. Statin toxicity
E. **Fanconi syndrome ***

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Question #2

Which of the following is the most likely diagnosis?

A. Cocaine toxicity: Muscle toxicity can occur; usually cardiac or rhabomyolysis.
B. Nucleoside-induced myopathy (ragged red fiber disease): ZDV induced; chronic, not acute
C. Serotonin syndrome: mental status normal, no shivering / fever, myoclonus
D. Statin toxicity: CPK normal
E. **Fanconi syndrome ***

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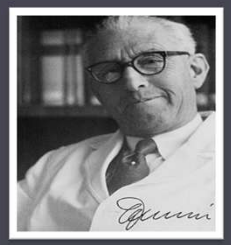
Fanconi Syndrome

- Type II RTA
- Generalized proximal tubule dysfunction
- Hypophosphatemia, renal glucosuria, hypouricemia, aminoaciduria
  - Not all have present at once
- Osteomalacia can occur
- Recovery is the rule; can take months



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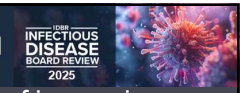
Question #3

PREVIEW QUESTION



- 35-year-old man presents with complaints of increasing fatigue, headache, SOB / DOE
- HIV diagnosed 4 months ago with PCP; intolerant to TMP/SMX
- Now on TAF / FTC / BIC + PCP Prophylaxis with Dapsone
- Claims adherence to all meds; "Doesn't miss a dose!"
- Normal PE
- Pulse Ox 85%; CXR no abnormalities
- ABG: 7.40 / 38 / 94/ 96% (room air)

16

Question #3

PREVIEW QUESTION

Which of the following is the most likely underlying cause of his symptoms?

A. Recurrent PCP
B. IRIS reaction
C. Drug toxicity
D. Pulmonary embolus
E. Patent foramen ovale

17

Question #3

PREVIEW QUESTION

Which of the following is the most likely underlying cause of his symptoms?

A. Recurrent PCP
B. IRIS reaction
C. **Drug toxicity ***
D. Pulmonary embolus
E. Patent foramen ovale

18

Question #3

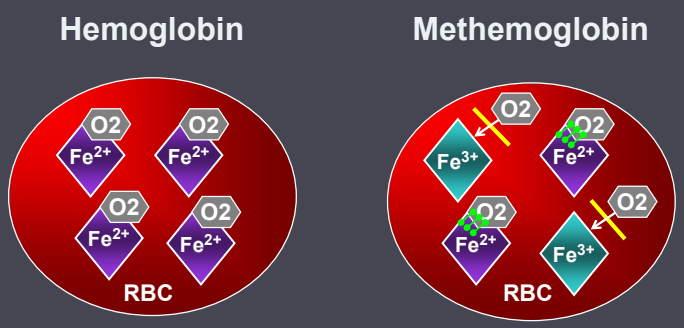
PREVIEW QUESTION

Which of the following is the most likely underlying cause of his symptoms?

A. Recurrent PCP: Unlikely with neg CXR and normal Pa02
B. IRIS reaction: Similarly, unlikely with neg CXR and no other symptoms
C. **Drug toxicity: Classic presentation for dapsone toxicity. "O2 Saturation Gap" ***
D. Pulmonary embolus: Possible, but much less likely than dapsone
E. Patent foramen ovale: Rare. Fixed Split S2

19

Hemoglobin and Methemoglobin



20

Question #4

In a 40-year-old male PWH non-smoker, non-diabetic with LDL cholesterol 125 mg/dl, HDL 45 mg/dl, with an ASCVD score of 1.5%, should he be started on a statin?

A. Yes
B. No
C. Not sure

21

Question #4

In a 40-year-old male PWH non-smoker, non-diabetic with LDL cholesterol 125 mg/dl, HDL 45 mg/dl, with an ASCVD score of 1.5%, should he be started on a statin?

A. **Yes ***
B. No
C. Not sure

22

REPRIEVE Study (Started in 2015)

- 7769 HIV+ men and women (30%) age 40 – 70 yo
- Low to moderate risk for statin use
- All patients on ARV Rx with CD4 > 100 cells / ul
- Randomized to Pitavastatin vs placebo
- Study stopped by DSMB
- Findings:
  - 35% reduction in CV events

23

Question #5

- 25-year-old woman presents with fatigue
- History of IV Heroin use; intermittently takes TDF/FTC PreP
- Exam no edema
- Work up in ER shows Creatinine 8.4; BUN 79; mild anemia; mild acidemia
- In ER 10 weeks earlier; normal renal function
- U/A high grade proteinuria
- US of kidneys: Normal to increase size; no obstruction
- Rapid HIV test positive

24

Question #5

Which of the following is the most likely cause of her renal failure?

A. Volume depletion / ATN
B. Heroin Associated Nephropathy
C. HIVAN
D. Membranous glomerulonephritis
E. Tenofovir Toxicity (PrEP)

25

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B. Heroin Associated Nephropathy
C. **HIVAN ***
D. Membranous glomerulonephritis
E. Tenofovir Toxicity (PrEP)

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Question #5

Which of the following is the most likely cause of her renal failure?

A. Volume depletion / ATN: Tubular damage doesn't lead to high-grade proteinuria
B. Heroin Associated Nephropathy: Typical nephrotic syndrome; slower progression to ESRD
C. **HIVAN: High-grade proteinuria; nl to large kidneys; NO EDEMA; rapid progression to ESRD ***
D. Membranous glomerulonephritis: Less common; needs rule out. More typical nephrotic syndrome
E. Tenofovir Toxicity (PrEP): Proximal tubule disease; low grade proteinuria, if at all

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Question #6 (Bonus)

In a patient with HIV Associated Nephropathy, which of the following is the most effective intervention to prevent progression to ESRD?

A. An ACE inhibitor
B. Corticosteroids
C. High molecular weight Dextran
D. Antiretroviral therapy
E. A calcium channel blocker

28

Question #6 (Bonus)

ARV Therapy is 1st Line Rx for HIVAN

In a patient with HIV Associated Nephropathy, which of the following is the most effective intervention to prevent progression to ESRD?

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B. Corticosteroids
C. High molecular weight Dextran
D. **Antiretroviral therapy ***
E. A calcium channel blocker

29

Question #6 (Bonus)

ARV Therapy is 1st Line Rx for HIVAN

In a patient with HIV Associated Nephropathy, which of the following is the most effective intervention to prevent progression to ESRD?

A. An ACE inhibitor: Important adjunct, but less effective than ARV therapy
B. Corticosteroids: Doesn't really work
C. High Molecular Weight Dextran: No indication
D. **Antiretroviral Therapy: HIV directly infects kidney parenchymal cells; ARV Rx critical ***
E. A calcium channel blocker: No Effect

30

Question #7

- 55-year-old man presents with complaints of fever / volume depletion
- HIV diagnosed in ER on rapid test
- Lymphadenopathy / splenomegaly / few petechiae / Oriented X 3
- HIV RNA 340,000; CD4= 3 cells/ul
- On no medications

Hb 8.2 gm/dl; Plt count 21,000; Creatinine 2.0

Rare schizocytes on peripheral blood smear

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Question #7

Which of the following is the most effective intervention to increase the platelet count?

A. Splenectomy
B. Corticosteroids
C. Plasmapheresis
D. Ethambutol + Azithromycin
E. Antiretroviral Therapy

32

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A. Splenectomy
B. Corticosteroids
C. Plasmapheresis
D. Ethambutol + Azithromycin
E. **Antiretroviral Therapy ***

33

Question #7

Which of the following is the most effective intervention to increase the platelet count?

A. Splenectomy: Rarely needed for HIV ITP
B. Corticosteroids: Will work, but not needed
C. Plasmaphoresis: This is not TTP. Pentad not complete; rare schiztocytes
D. Ethambutol + Azithromycin: He could well have MAC, but need BM bx to show pdtion pblm
E. **Antiretroviral Therapy: HIV coats platelets, attract Anti-HIV Ab, leads to removal by spleen. ARV Rx lowers VL, plts rise to near normal levels ***

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Question #8

- 45-year-old recently diagnosed with HIV
- HIV RNA 140,000; CD4= 230 cells/ul
- Baseline labs:
- Hb 11.2 gm/dl; AST 310 / ALT 120

140|101 | 5 Gluc 100
4.2 | 28 |1.1 eGFR = 65 ml/min

- Started on TAF/FTC+ Dolutegravir; No other medications
- Returns 4 weeks later, labs unchanged except creatinine now 1.3 mg/dl (eGFR 55)

35

Question #8

Which of the following is the most likely cause of her increased creatinine / reduced eGFR?

A. Glomerular lesion
B. Proximal Tubule damage
C. Proximal Tubule inhibition
D. Distal Tubule damage
E. Distal Tubule inhibition

36

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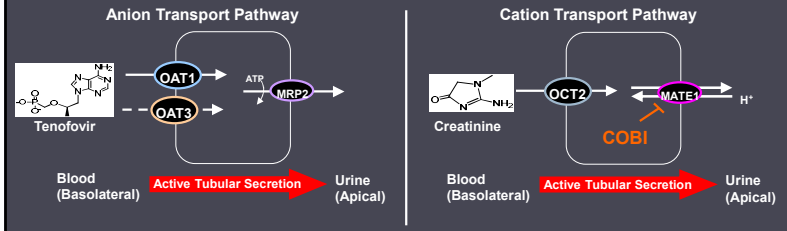
37

Tenofovir and COBI Interact with Distinct Renal Transport Pathways

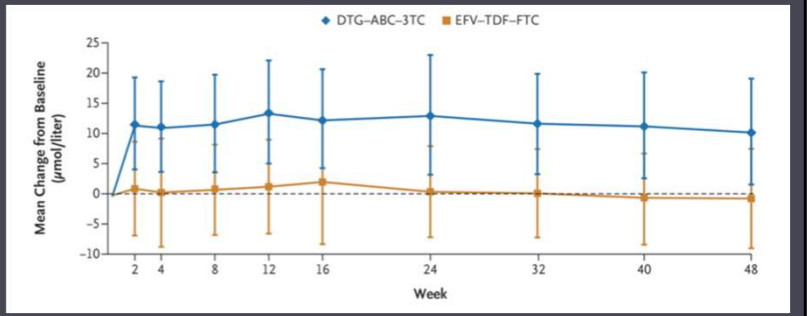


The active tubular secretion of tenofovir and the effect of COBI on creatinine are mediated by distinct transport pathways in renal proximal tubules

Ray A, et al. Antimicro Agents Chemo 2006;3297-3304
Lepist E, et al. ICAAC 2011; Chicago. #A1-1724

38

Changes in eGFR



Walmsley, et al. N Engl J Med. 2013;369:1807-18

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Question #9

- 26-year-old presents with cryptococcal meningitis and newly diagnosed HIV (Rx with AMB +5FC; to fluconazole)
- HIV RNA 740,000; CD4= 23 cells/ul
- Baseline labs:
- CSF: 2 lymphocytes / protein 54 / glu 87 (serum 102)
  OP = 430 mm H_20
  Started on TAF/FTC /Bictegravir at week 2
- Returns 6 weeks later, Fever 103 and a mass in supra-clavicular region (3 x 4 cm)

40

Question #9

Which of the following is the most likely cause of the new mass?

A. B Cell Lymphoma
B. Multicentric Castleman's Disease
C. IRIS reaction to cryptococcus
D. Mycobacteria Avium Complex
E. Bacterial Abscess from prior PICC line

41

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A. B Cell Lymphoma
B. Multicentric Castleman's Disease
c. IRIS reaction to cryptococcus *
D. Mycobacteria Avium Complex
E. Bacterial Abscess from prior PICC line

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IRIS

- Immune Reconstitution Inflammatory Syndrome
- Occurs 4 – 12 weeks after initial ARV administration
- Most often in patients with advanced HIV infection
- High viral load / low CD4 count
- TB, MAC, crypto, PML, KS are most common OIs
- Is **NOT** related to type of ARV therapy

43

Question #10

- 48-year-old male presents with newly diagnosed HIV infection
- Asymptomatic
- **Initial: HIV RNA 160,000 c/ml**
  CD4 count 221 cells/ul
- Other labs are normal; Started on ARV Rx with DTG + TAF/FTC
- Returns for a 3 month follow up visit
- **HIV RNA < 20 c/ml; CD4 390 cells/ul**

44

Question #10

Which of the following will most likely be present on his 3 month visit from use of dolutegravir?

A. Morbilliform skin rash (extremities)
B. 3 kg weight gain
C. Mild cognitive impairment
D. Depression
E. Anemia

45

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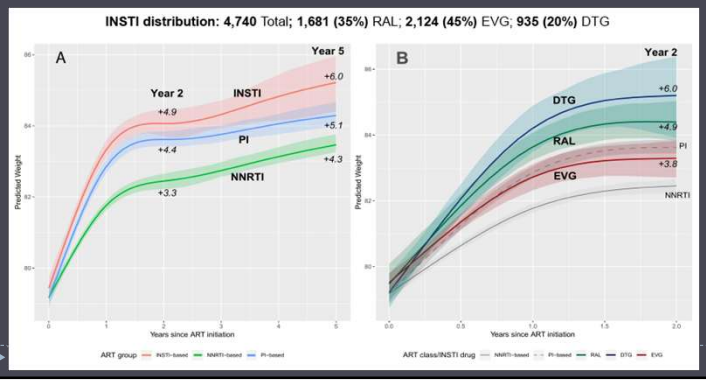
46

Change in Weight Overtime – NA-ACCORD

Bourgi et al CROI 2019



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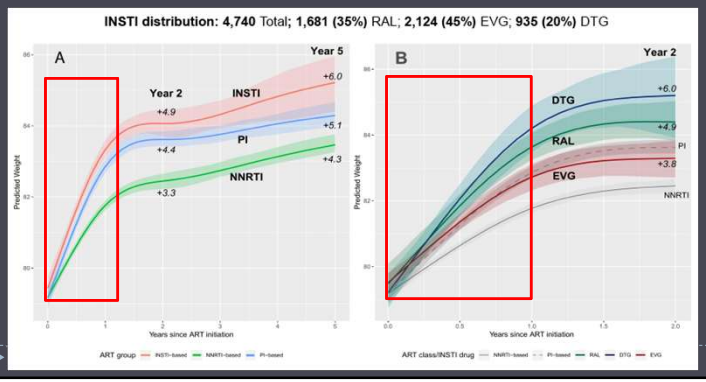
Bourgi et al CROI 2019



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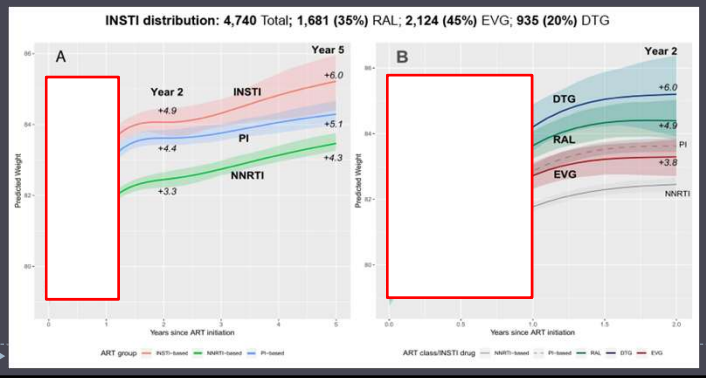
Change in Weight Overtime – NA-ACCORD

Bourgi et al CROI 2019



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Question #11

- 48-year-old male presents with newly diagnosed HIV infection
- Asymptomatic except for weight loss / fatigue
- **Initial: HIV RNA 160,000 c/ml**
  CD4 count 221 cells/ul
- Other labs are normal; Started on ARV Rx
- Returns for a 3 month follow up visit
- **HIV RNA < 20 c/ml; CD4 390 cells/ul**

50

Question #11

Assuming he remains undetectable, you tell him that his risk of transmitting HIV to his seroneg partner via sex is:

A. Virtually zero risk (< 0.2%)
B. Very low risk (< 2%)
C. Possible (<10 %)
D. It depends on which ARV regimen he's on

51

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C. Possible (<10 %)
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52

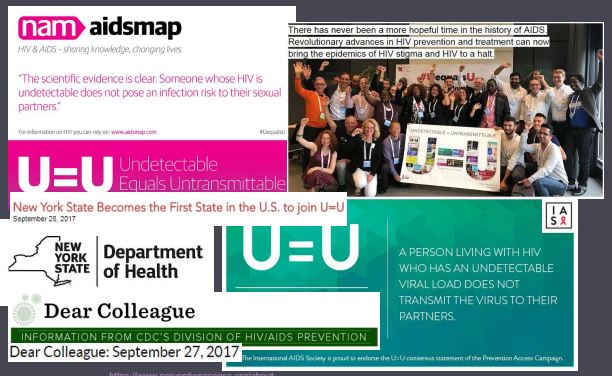
PARTNERS Study

- 548 heterosexual and 972 discordant gay couples followed up to 8 years
- Seropositive partner had VL < 200 c/ml
- 77,000 sexual acts without condoms
- Zero transmissions (from seropositive partner)
- Upper bound of 95% CI: 0.23 /100 CYFU
- **Sexual Transmission from a person with Undetectable Viral Load is Effectively Zero**

Rodger AJ, et al. Lancet 393: 2428-38, 2019

53

U=U: Undetectable=Untransmittable



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Question #12

- 58-year-old MSM male presents for routine evaluation
- On ARV Rx:
- HIV RNA < 20 c/ml; CD4 590 cells/ul
- He is sexually active with 3 to 4 different partners/year
- Receptive and insertive anal intercourse
- A routine annual anal PAP is collected and shows LSIL

55

Question #12

Which of the following should be performed?

A. High Resolution Anoscopy with Biopsy
B. Digital Rectal Exam; if negative monitor for 1 yr
C. Sigmoidoscopy
D. Colonoscopy
E. Monitor only; repeat anal PAP in 6 months

56

Question #12

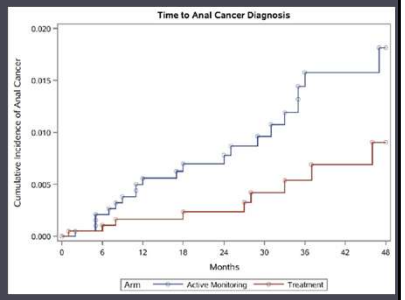
Which of the following should be performed?

A. **High Resolution Anoscopy with Biopsy ***
B. Digital Rectal Exam; if negative monitor for 1 yr
C. Sigmoidoscopy
D. Colonoscopy
E. Monitor only; repeat anal PAP in 6 months

57

Treatment of HSIL Reduces Risk of Anal Cancer By 57%

- **30 anal cancers diagnosed** in median f/u of 25.8 months
  - 9 in Treatment arm (173/100,000 PY)
  - 21 in Active Monitoring arm (402/100,000 PY)
- 8 study-related serious AEs:
  - 7 in treatment arm (3 pain, 3 abscess, 1 skin ulceration)
  - 1 in monitoring arm (infection)



Anal dysplasia

Palefsky J, et al. N Engl J Med 2022; 386:2273-2282

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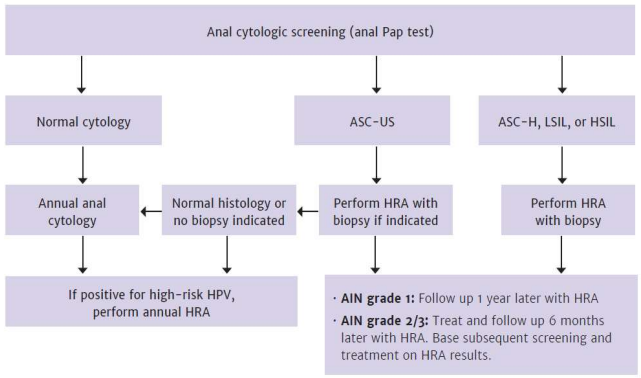
Figure 1. Follow-up of Anal Cytologic Screening Results



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Recommendations: Screening

- Clinicians should promote smoking cessation for all patients with HIV, especially those at increased risk for anal cancer. (A3)
- For all patients aged ≥35 years with HIV, clinicians should recommend and perform DARE annually to screen for anal pathology (B3)
- Clinicians should evaluate any patient with HIV who is <35 years old and presents with signs or symptoms that suggest anal dysplasia. (A3)
- Clinicians should conduct or refer for HRA and histology (via biopsy) in any patient with abnormal anal cytology. (A2)
- Clinicians should refer patients with suspected anal cancer determined by DARE or histology to an experienced specialist for evaluation and management. (A3)

7/25/2025 NYSDOH AIDS Institute Clinical Guidelines Program

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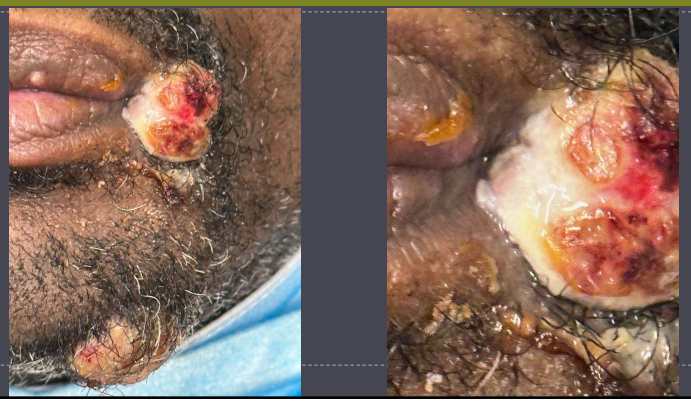
Question #13

- 30-year-old male presents with new lesions on his buttocks, groin, back, and face
- MSM; reports fever
- Denies sexual activity in the last 12 weeks
- HIV RNA 68,000 c/ml (off ARV now)
  CD4 count 250 cells/ul
- UDS + methamphetamine

61

Question #13



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Question #13

In addition to STI screening and Mpox culture, which of the following would you do?

A. Treat for molluscum contagiosum
B. Start tecovirimat at this visit
C. Wait for cultures, if positive for mpox, start tecovirimat
D. No specific mpox Rx; give JYNNEOS vaccine now instead
E. Administer Benzathine Penicillin

63

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64