

# The Consequences and Management of HIV & Aging



Steven Deeks, MD SFGH

Peter Carnini, MA New Leaf

Matt Sharp, Project Inform





# Agenda

- Introductions & Housekeeping
- Community Announcements
- Two Perspectives-Presentations then Q &A
  - Clinical
  - Psychosocial
- Networking



# Context

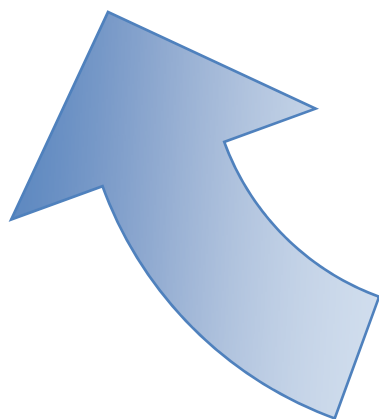
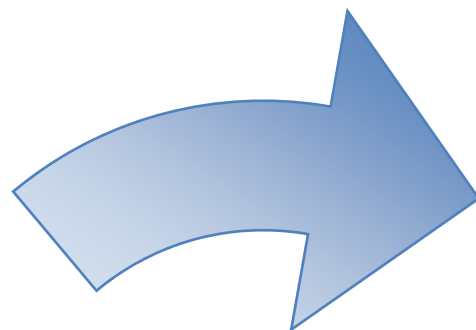
- Aging prevalence is increasing
  - UK nearly a third are >45 years old
  - US almost half 50+ years old by 2015
  - SF >50+ years old- 27% 2003/40% 2008
- One group are those who have survived due to successful antiretroviral therapy
  - HIV mortality is down
- Another group are the newly diagnosed
  - 15% > 50 years old
- Life expectancy has increased significantly but still is not the same as HIV negatives



**HIV persistence,  
immune activation  
& inflammation**

**non-AIDS events**

**aging  
processes**





## Non-AIDS events (1)

- Definition-non-HIV related illnesses or diseases
  - not caused by HIV and not opportunistic diseases
- Deaths due to non-AIDS events exceed AIDS related deaths
- Events are occurring more frequently now than in the early days
- Low t-cells on treatment
- Inflammation
- Direct viral infection



## Non-AIDS events (2)

- Organ diseases-heart, liver (hepatitis) & kidney
- Cancers
- Neurocognitive
- Bone
- Frailty
- Others?



# Chronic Inflammation

- Inflammation decreases w/ HAART but never returns to normal
- Certain inflammatory cells and cytokines are switched on due to chronic immune responses
- Microbial translocation in early disease
- Irreversible lymph node structure and thymic dysfunction
- Other co-infections
- HIV persistence-low level replication
- HIV persistence → immune activation → chronic inflammation → certain diseases and/or conditions



# HIV “persistence”

- Despite treatment, t-cell activation persists
- Low level HIV in latent (quiescent) CD4 cells in reservoirs
- Cells must be activated to release virus
- Cannot be detected by standard VL assays
- Viral proteins in the latent reservoir can be toxic

*--New research into purging virus by activation of cells-  
aka. functional cure*



# The Consequences of HIV & Aging on the Immune System

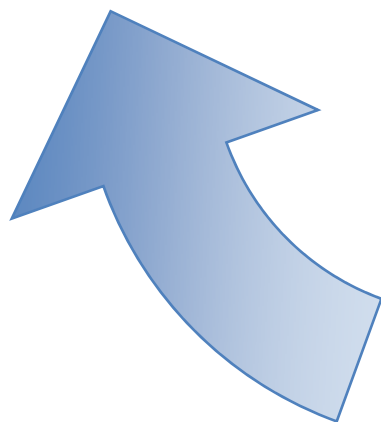
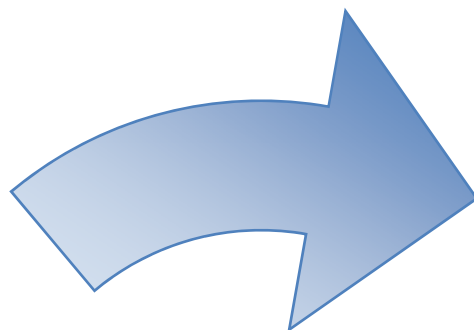
- HIV causes greater degree of immunosuppression than aging through...
  - apoptosis-programmed cell death
  - immunosenescence-immunologic aging
  - decreased thymic output
  - inverted CD4 & CD8 ratio's
  - functional capacity is unknown
  - oxidative stress



**HIV persistence,  
immune activation  
& inflammation**

**non-AIDS events**

**aging  
processes**





# Management

- Managing disease risks-heart disease, lipid lowering agents, blood pressure, Vitamin D?
- Screening for cancers-i.e. HPV, colon cancer
- Drug toxicities can be avoided for the most part-individualizing treatment
- Diet & exercise, stress reduction
- New treatment possibilities
  - immune based-IL-7 & treatment vaccines
  - activation drugs to reduce inflammation
  - new treatment strategies
  - new delivery systems



## References/Resources

- *Inflammation and Non-AIDS Events: Are Antiretroviral-Treated Patients Aging Too Quickly and If So, Why?* W. David Hardy, MD Steven Deeks, MD; Clinical Care Options
- *Premature Aging and HIV*; Bob Huff; Tagline Fall '08
- *IAS: Aging and HIV*; Rob Dawson [www.aidsmap.com](http://www.aidsmap.com)
- *HIV and Aging: The Long Term Consequences of Successful Antiretroviral Therapy*; [www.natap.org](http://www.natap.org)
- *HIV and Inflammation: A Paradigm Shift*; IAS 2009 Waffa El-Sadr, MD MPH



**Questions?**