Why You Should Count (On) CD4

Fact Sheet

based on the 2016[1] and 2017[2] WHO Guidelines

The 2016[1] and 2017[2] WHO guidelines provide guidance on the diagnosis of human immunodeficiency virus (HIV) infection, the care of people living with HIV and the use of antiretroviral (ARV) drugs for treating and preventing HIV infection.

While these guidelines recommend lifelong antiretroviral therapy (ART) regardless of CD4 cell count ("treat all policy") and analysis of viral load (VL) as the preferred monitoring approach, they also provide clear guidance on the indispensable role of CD4 in assessing baseline risk of disease progression, particularly for individuals presenting with advanced disease, decisions regarding starting and stopping prophylaxis for opportunistic infections (OIs), and prioritization decisions regarding ART initiation in settings where universal treatment is not possible. CD4 cell count measurement may also be important for people who are failing ART.

Baseline testing

All patients entering or re-entering care should receive a CD4 test at treatment baseline.[2;3] Relying on clinical staging alone risks missing substantial numbers of people living with HIV with severe immune suppression.

Identification of advanced HIV disease

For adults and adolescents, and children older than five years, advanced HIV disease is defined as CD4cell count **<200cells/µL** or WHO stage 3 or 4 event.[2] All children younger than five years old with HIV are considered as having advanced HIV disease.[2] A severely immunosuppressed adult is defined as having a CD4cell count **<50cells/µL**.[2]

Prophylaxis and management of opportunistic infections*

Co-trimoxazole (CTX) prophylaxis

Co-trimoxazole (CTX) prophylaxis is recommended for adults (including pregnant women) with severe or advanced HIV clinical disease (WHO stage 3 or 4) and/or with a CD4 count ≤**350 cells/µL**.[1;2]

Co-trimoxazole prophylaxis is recommended for infants, children and adolescents with HIV, irrespective of clinical and immune conditions. Priority should be given to all children younger than 5 years old regardless of CD4 cell count or clinical stage, and children with severe or advanced HIV clinical disease (WHO clinical stage 3 or 4) and/or those with a CD4 count ≤**350 cells/µL**.[1;2]

Pre-emptive antifungal therapy

Pre-emptive antifungal therapy: In adults and adolescents, if blood cryptococcal antigen screening positive among people with CD4 counts **<100 cells/µL** (where lumbar puncture is negative or not feasible or if lumbar puncture excludes cryptococcal meningitis).[1]

LF-LAM

LF-LAM may be used to assist in the diagnosis of active TB in adult inpatients living with HIV, with signs and symptoms of TB (pulmonary and/or extrapulmonary), who have a CD4 count less than or equal to **100 cells/µL**, or people living with HIV who are seriously ill, regardless of CD4 cell count or with unknown CD4 cell count.[1]

Cryptococcal Antigen Screening

The routine use of serum or plasma **cryptococcal antigen screening** among ART-naive adults may be considered before ART initiation (or re-initiation) among people with a CD4 cell count of less than **100 cells/µL**.[1]

(Cryptococcal antigen screening for adolescents and children is not recommended).
*This summary is not exhaustive. Please refer to documents (1) and (2) in the reference list for details.

Rapid Initiation of ART

Rapid ART start is especially important for people with very low CD4 cell count, for whom the risk of death is high.

WHEN TO START ART

CHILDREN

ART should be initiated in all children living with HIV, regardless of WHO clinical stage or at any CD4 cell count:
- Infants diagnosed in the first year of life
- Children living with HIV 1 year old to less than 10 years old

As a priority, ART should be initiated in all children <2 years of age or children younger than 5 years of age with WHO clinical stage 3 or 4 or CD4 count ≤**750 cells/µL** or CD4 percentage <25% and children 5 years of age and older with WHO clinical stage 3 or 4 or CD4 count ≤**350 cells/µL**.

ADOLESCENTS

ART should be initiated in all adolescents living with HIV, regardless of WHO clinical stage and at any CD4 cell count.

As a priority, ART should be initiated in all adolescents with severe or advanced HIV clinical disease (WHO clinical stage 3 or 4) and adolescents with a CD4 count ≤**350 cells/µL**.

ADULTS

ART should be initiated in all adults living with HIV, regardless of WHO clinical stage and at any CD4 cell count.

As a priority, ART should be initiated in all adults with severe or advanced HIV clinical disease (WHO clinical stage 3 or 4) and adults with a CD4 count ≤**350 cells/µL**.

ADULTS AND CHILDREN WITH TB

ART should be started in all TB patients living with HIV regardless of CD4 count. TB treatment should be initiated first, followed by ART as soon as possible within the first 8 weeks of treatment.

HIV-positive TB patients with profound immunosuppression (e.g. CD4 counts less than **50 cells/µL**) should receive ART within the first two weeks of initiating TB treatment.

ART should be started in any child with active TB disease as soon as possible and within 8 weeks following the initiation of antituberculosis treatment regardless of the CD4 cell count and clinical stage.

TREATMENT FAILURE MONITORING

If viral load testing is not routinely available, **CD4 count and clinical monitoring should be used to diagnose treatment failure**, with targeted viral load testing to confirm viral failure where possible.[1]

In settings where routine viral load monitoring is available, CD4 cell count monitoring can be stopped in individuals who are stable on ART and virally suppressed.[1]

IDENTIFICATION OF IMMUNOLOGICAL FAILURE

WHO definitions of immunological failure for the decision to switch ART regimens:[1]
Adults and adolescents: CD4 count at or below **250 cells/µL** following clinical failure, OR persistent CD4 levels below **100 cells/µL**
Children older than 5 years:
Persistent CD4 levels below **100 cells/µL**
Children younger than 5 years:
Persistent CD4 levels below **200 cells/µL**

CD4 along the continuum of patient care

All patients entering or re-entering care should receive a CD4 test at treatment baseline.[2;3]
Relying on clinical staging alone risks missing substantial numbers of people living with HIV with severe immune suppression.

HIV TESTING

Baseline CD4 test	Identification of advanced disease

MANAGEMENT OF OPPORTUNISTIC INFECTIONS

PROPHYLAXIS	TB and CrAg testing

HIV TREATMENT

ART initiation	Identification of treatment failure and immunological failure

(1) World Health Organization (2016): Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach – 2nd ed. WHO, Geneva, pages xxxi; xxxiv; 131; 193; 197; 205.
(2) World Health Organization (2017): Guidelines for managing advanced HIV disease and rapid initiation of antiretroviral therapy. WHO, Geneva, pages v; 6; 35-37.
(3) World Health Organization (2017): What's new in treatment monitoring: Viral load and VCD4 testing. Information Note WHO/HIV/2017.22, Geneva.

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