

KITSO AIDS Training Program

Lecture 5:

**Pediatric- and Adolescent-Specific Issues
in HIV/AIDS Care**

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- Outline**
- Background
 - Pediatric Diagnosis of HIV Infection
 - Common Manifestations of Pediatric HIV Infection
 - Management of HIV Infection in Children: CTX Prophylaxis and Nutritional needs of children
 - ARV Therapy in Children
 - When to start
 - Which regimens
 - What and how to monitor
 - Dosing Guidelines/Tools
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Background (1)

- Worldwide, there are 2.5 million children living with HIV (UNAIDS 2007)
- Worldwide, about 1,150 HIV-infected children are born every day due to peri-natal transmission. (UNAIDS 2007)
- High HIV prevalence persists in Botswana among women of childbearing age.

HIV Prevalence in Botswana 2003: BAIS II

Age Group	males	females
1.5-4 years	6.5	7.5
5-9 years	6.5	6.5
10-14 years	4.5	4.5
15-19 years	8.5	9.5

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Background (2)

- Pathogenesis and general immunologic and virologic principles are similar in adults and children.
- Mother to Child Transmission (MTCT)
 - HIV-infected pregnant women will expose their fetus/baby to HIV.
 - The mother always transmits her HIV antibodies to her baby. These antibodies are not infectious.
 - Even though the baby will always be born with maternal HIV antibodies, the baby has at most, without any PMTCT interventions, only a 40% chance of becoming HIV-infected. (In babies not infected by HIV, these maternal antibodies disappear by 18 months of age).
- Vulnerable member of community
 - Dependent on others for their care/adherence

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Pathophysiology

- HIV infection in a developing body
 - Immature immune system:
 - Babies and young children normally have high absolute CD4 counts, which change greatly in the first 5 years of life. CD4 % may also decline during the first few years of life, but to a lesser degree.
 - Even with high CD4 count and CD4%, children are more vulnerable to HIV-related infections and can have rapid progression of disease.
 - It is necessary to monitor CD4% as well as absolute count.

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Pathophysiology (2)

Normal age-related CD4 count and CD4% ranges (no immune suppression):

< 12 months	1-5 years	6-12 years
≥ 1500 cells/μL (≥ 25%)	≥ 1000 cells/μL (≥ 25%)	≥ 500 cells/μL (≥ 25%)

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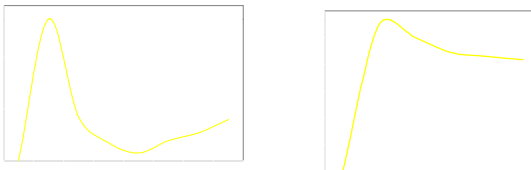
Pathophysiology (3)

- Immature liver and kidneys:
 - Drug metabolism is different from that of adults, and ARV doses must be adjusted accordingly.
- Increasing weight with growth:
 - Doses of ARVs are based on body size (weight and body surface area), with resultant risk of errors in correct dosing.
- Medication adherence challenges:
 - Bad taste of certain ARVs
 - Inability to swallow pills

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Pathophysiology (4)

- Viral loads are higher: Because of immaturity of the immune system at birth, control of viral replication in infants is poor. Thus, higher viral loads are reached and persist for a longer duration before steady-state levels are reached.



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Diagnosis of HIV Infection

- Between birth and 18 months of age: DNA-PCR
 - DNA-PCR at 4-6 weeks of age
 - A single positive DNA-PCR on a child under a year of age is an indication for treatment.
 - A second DNA-PCR should still be done for confirmation, but do not wait for the confirmatory result before starting HAART. (A false positive DNA PCR is extremely rare, and the risk of death while awaiting confirmatory result before starting HAART is much higher).
- Beyond 18 months of age: HIV antibody tests (same as for adults)
 - ELISA or rapid test
 - Children not breastfed, and who initially are DNA PCR negative, should have confirmatory rapid test at 18 months to rule out possible undisclosed breastfeeding and/or false-negative DNA PCR.

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Diagnosis of HIV Infection (2)

- If the DNA PCR is negative at 6 weeks, breastfeeding infants require another HIV test (DNA-PCR or rapid test, according to age) 6 weeks after complete cessation of breastfeeding.
- Management of babies < 18 months of age with pending DNA-PCR results:
 - While awaiting DNA-PCR results, the baby must be clinically evaluated on a monthly basis, with WHO clinical staging.
 - Any baby who has a WHO clinical condition 2, 3, or 4, must be discussed with an HIV Specialist for possible initiation of HAART, pending final return of the DNA-PCR.

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Common Childhood Problems are Often More Severe In HIV-Infected Children

- Infectious Diseases
 - Respiratory illnesses
 - Diarrheal illnesses
 - Chronic otitis media
- Growth failure: Kwashiorkor, Marasmus
- Developmental delay
- Loss of growth milestones

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Diarrheal Illnesses

- Pathogens which cause diarrhea in healthy children cause more severe illness in HIV-infected children

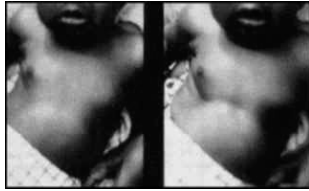


- HIV-infected children also frequently become sick from organisms that do not commonly cause disease in healthy children (e.g., isospora, cryptosporidia)

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Respiratory Tract Infections

– Acute pyogenic pneumonia and tuberculosis are common in both HIV-infected and uninfected children. However, outcomes are worse in HIV-infected children.



PCP, the “AIDS pneumonia,” is a common cause of death in HIV-infected children below 6 months of age.

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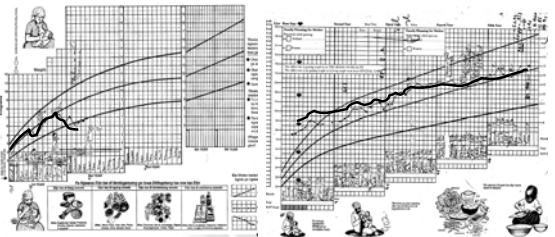
Malnutrition



Kwashiorkor Marasmic Kwashiorkor Marasmus

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Progression of HIV Disease in Untreated Children



Both of these growth patterns are abnormal and should be of concern:
•The child on the left has lost >10% of body weight.
•The child on the right had excellent growth for the first 6 months of life, after which time the growth curve flattens, indicating that the child is no longer gaining weight appropriately.

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**Problems Common in HIV-Infected Children
which are Uncommon in Uninfected Children**

- Severe, recurrent bacterial infections
- Persistent or recurrent oral thrush
- Bilateral, painless parotid enlargement
- Generalized, persistent lymphadenopathy
- Hepatosplenomegaly (in non-malarial areas)
- Persistent or recurrent fevers
- Neurologic dysfunction
- Herpes zoster
- Persistent generalized dermatitis, not responsive to standard treatments

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**Pediatric WHO
Clinical Stages**

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Pediatric WHO Clinical Stage 1

**Asymptomatic or Persistent
Generalized Lymphadenopathy**

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**Pediatric WHO Clinical Stage 2:
“Mild” Disease**

- Persistent unexplained hepatosplenomegaly
- Papular pruritic eruptions
- Extensive HPV infection
- Extensive molluscum contagiosum
- Recurrent oral ulcerations
- Unexplained persistent parotid enlargement
- Lineal gingival erythema
- VZV
- Recurrent or chronic upper respiratory infections (otitis media, tonsillitis, sinusitis)
- Fungal nail infections

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**Pediatric WHO Clinical Stage 3
“Advanced” Signs and Symptoms:**

- Unexplained moderate malnutrition
- Unexplained persistent diarrhea for 14 days
- Unexplained persistent fever for 1 month
- Persistent thrush after 6 weeks of age
- Persistent oral hairy leukoplakia
- Acute necrotizing ulcerative gingivitis/periodontitis

(continued)

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**Pediatric WHO Clinical Stage 3
“Advanced” Signs and Symptoms (2)**

- Pulmonary or lymph node TB
- Severe recurrent bacterial pneumonia
- Lymphoid interstitial pneumonitis
- Chronic HIV-related lung disease, including bronchiectasis
- Unexplained anemia (< 8gm%), neutropenia (< 500/ μ L) or thrombocytopenia (< 50,000/ μ L)

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**Pediatric WHO Clinical Stage 4
 “Severe” Signs and Symptoms:**

- Severe wasting, stunting, or malnutrition
- PCP
- Severe recurrent bacterial infections, excluding pneumonia (e.g., meningitis, osteomyelitis)
- Chronic HSV infection > 1 month
- Extra-pulmonary TB, except lymph node TB
- KS
- Esophageal candidiasis
- CNS toxoplasmosis
- HIV encephalopathy (continued)

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**Pediatric WHO Stage 4:
 “Severe” Signs and Symptoms (2)**

- CMV infection (e.g., retinitis, gastroenteritis)
- Extra-pulmonary cryptococcosis, including meningitis
- Disseminated endemic mycosis
- Chronic cryptosporidiosis or isosporosis
- Disseminated non-TB mycobacterial infection
- Cerebral or non-Hodgkin’s lymphoma
- Progressive multifocal leukoencephalopathy
- HIV-related cardiomyopathy or nephropathy

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Immunologic Staging

WHO Immunologic Staging Guidelines for Children

WHO immunologic stage	<1 year	1 ≤ 3 years	3 ≤ 5 years	≥ 5 years
Mild	30-35%	25-30%	20-25%	350-499 cells/μL
Advanced	25-29%	20-24%	15-19%	200-349 cells/μL
Severe	<25% or <1500 cells/μL	<20% or <750 cells/μL	<15% or <350 cells/μL	< 15% or <200 cells/μL

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Management of the HIV-Exposed and/or Infected Child

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Management of Pediatric HIV Exposure

- NVP syrup 6mg as a single dose as soon as possible after deliver, but no later than 72 hours. Preterm (< 35 weeks gestation) and low birth weight (<2.5kg) babies should receive 2mg/kg NVP.
- Begin AZT at birth and continue for four weeks:
 - AZT 4mg/kg every 12 hours for 4 weeks. If preterm or low birth weight, the AZT dose is 2mg/kg every 12 hours for 2 weeks, which is then increased to 2mg/kg dose every 8 hours (TDS) for the final 2 weeks.
- Infants brought in for care beyond 72 hours of birth should not receive sd-NVP or AZT prophylaxis.

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Management of Pediatric HIV Exposure (2)

- All children must be appropriately immunized.
 - Administer all routine childhood immunizations except:
 - If at birth, the infant appears to have HIV-related signs and symptoms, do not give BCG until HIV infection has been ruled out.
 - If BCG is not given at birth, rule out HIV infection before giving it later.
 - Defer measles vaccine for children with severe immune suppression until HAART has restored immunity (CD4% > 25%), unless the risk of measles is believed to be greater than the risk of adverse vaccine events.

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Cotrimoxazole Prophylaxis

- CTX prophylaxis is protective not only against pneumocystis pneumonia, but also against other respiratory and diarrheal pathogens, TB, and malaria.
- As in adults, CTX should be given OD in children to be effective against pathogens other than PCP, as above.
- WHO simplified dosing chart should be used in place of dose calculations.

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WHO Simplified CTX Dosing for Pediatric Patients:

Age (and weight) of child	Recommended OD dose	Suspension: 5ml syrup= 200mg/40mg	Child tablet 100mg/20mg	SS adult tablet 400mg/80mg	DS adult tablet 800mg/160mg
6 wks to 6 mos (< 5kg)	100mg SMX/20mg TMP	2.5 ml	1 tablet		
6 mos to 5 yrs (5-15kg)	200mg SMX/40mg TMP	5.0 ml	2 tablets	½ tablet	
6 yrs to post-pubertal	400mg SMX/80mg TMP	10.0 ml	4 tablets	1 tablet	½ tablet
Post-pubertal to adult	800mg SMX/160mg TMP			2 tablets	1 tablet

For a documented history of severe cotrimoxazole toxicity, dapsone 2mg/kg OD to a maximum of 100mg OD.

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Indications for Cotrimoxazole

AGE	WHEN TO BEGIN (OR CONTINUE) CTX	WHEN TO STOP CTX
6 weeks to one year	6 weeks of age	-DNA PCR negative and not breastfeeding -if breastfeeding, continue CTX until HIV test negative at least 6 weeks after cessation of breastfeeding. -DO NOT STOP if child is HIV positive and <one year of age.
1-5 years	-CD4% <25%, or -WHO Clinical Category 2, 3 or 4 disease	-CD4>25% and -no active WHO Clinical Category 2, 3, or 4 disease in the prior 6 months
≥5 years	-CD4%<15% or CD4 count < 200 cells/μL, or -WHO Clinical Category 2, 3, or 4 disease	-CD4% >15% and CD4 count >200 cells/μL and -no active WHO Clinical Category 2, 3, or 4 disease in the prior 6 months

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Indications for Cotrimoxazole (2)

<u>AGE</u>	<u>WHEN TO BEGIN CTX</u>	<u>WHEN TO STOP CTX</u>
All ages	Child who qualifies for HAART, but is not currently receiving HAART	HAART initiated and there are no other indications for CTX
All ages	virologic failure on HAART	viral load resuppressed

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Nutrition

- HIV-infected children need more calories and protein than uninfected children.
 - Caloric requirements increase during infections.
- Consistent sources of healthy foods may be a problem in HIV-affected families.
 - Poverty, employment, loss of wage earners
 - Changing caregivers
- Traditional beliefs often underestimate food requirements of children, both infected and uninfected.
- Boil drinking water for 20 minutes whenever there is an outbreak of diarrheal disease due to water contamination. Consider CTX prophylaxis, until the outbreak has ended.

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When to Start HAART in Children

- In contrast to adults, immunologic and virologic predictors of progression in asymptomatic children and infants are not well defined.
- High viral load and low CD4% are both independent predictors of disease progression, but are of low predictive value for an individual child.

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When to Start HAART in Children (2)

- The youngest children are at greatest risk for rapid deterioration.
 - In the first year of life:
 - 15-20% develop AIDS or die.
 - 50% develop moderate immune suppression.
 - Infants can progress to AIDS even with high CD4% values.
 - For above reasons, give HAART to all children < 1 year
- Risk of disease progression slows down in children over one year of age.
 - 10% will survive for a prolonged period (over 5-6 years) without HAART.

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Pediatric Eligibility for HAART

- All infants < 12 months of age.
- For children > 1 year of age:
 - WHO clinical stage 3 (“advanced”) or 4 (“severe”) signs or symptoms, or
 - “Advanced” or “severe” immune suppression by WHO CD4-based criteria:

WHO immunologic stage	<1 year	1≤3 years	3≤5 years	≥5 years
Mild	Treat	No HAART	No HAART	No HAART
Advanced	Treat	20-24%	15-19%	200-349 cells/μL
Severe	Treat	<20% or <750 cells/μL	<15% or <350 cells/μL	< 15% or < 200 cells/μL

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HIV-Exposed Infants Without DNA PCR Results

- HIV-infected babies are at high risk of severe illness and death.
- HIV-exposed babies for whom the DNA PCR result is not available within one month of having been drawn must be clinically monitored and staged monthly.
- HIV-exposed babies who have a WHO clinical stage 2, 3, or 4, *should be discussed with an HIV Specialist for possible initiation of HAART, pending return of the DNA-PCR.*

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Children Not Qualifying for Treatment

- Children **over 12 months of age** who are WHO clinical stage 1 or 2, and who do not have advanced or severe immune suppression do not qualify for HAART
- **BUT** regular monitoring is required:
 - CD4% every three months.
 - Clinical status with height and weight every three months.
 - Developmental stages (milestones).
 - For children under 2 years, head circumference every three months.

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Treatment

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Children Who Received sd-NVP at Birth

Before initiating HAART, *it is essential to determine whether the pediatric patient received **sd-NVP** at birth*, since **NVP** resistance arising from **sd-NVP** can cause treatment failure with **NVP**-based HAART. *A history of maternal participation in PMTCT is a sufficient indicator of neonatal **sd-NVP** exposure.*

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**Recommended HAART Regimens
(No Prior sd-NVP)**

UNDER AGE 3 YEARS:
AZT + 3TC + NVP

OVER AGE 3 YEARS:
AZT + 3TC + EFV
or
AZT + 3TC + NVP

(**d4T** should be used in place of **AZT** if
baseline severe anemia is present)

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Recommended HAART Regimens (2)

- Second line regimen: **ABC + d4T + LPV/r**
 - If **d4T** had been used for first line regimen, use **AZT** in place of **d4T**. If anemia has not resolved, then consult an HIV Specialist.
 - **d4T** side effects are less common and less severe in pediatric patients compared to adults, but once a patient completes puberty, **d4T** must be switched to another ARV, e.g., **TDF**.
- Second line failure: resistance assay (while patient is still on the failing regimen) and consult with an HIV Specialist. Do not wait for more than 4 weeks for assay to return: change to empiric third line regimen under Specialist guidance.

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Recommended HAART Regimens (3)

- The previous second line regimen (**d4T + ddl + LPV/r**) is very difficult for most children to take:
 - **ddl** must be given on an empty stomach.
 - **LPV/r** must be given at least 1 hour later with food.
 - Prior second line regimen requires four times a day dosing.
- Adherence problems with **ddl** require switching to **ABC**, with follow-up *priority* viral load in 6 weeks to ensure continued viral suppression.
- The onset of puberty—specifically, Tanner stage 4--necessitates replacement of **d4T + ddl** with **TDF + FTC** (or **3TC**), to prevent **d4T/ddl** toxicities.

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Infant sd-NVP and HAART Options

- Children who received **sd-NVP** at birth:
 - If the infant is under 6 months of age, the case must be discussed with a pediatric HIV Specialist before initiating HAART.
 - If the infant is over 6 months of age, the first line regimen is **AZT (or d4T for anemia) + 3TC + LPV/r**.
- Infants and children with a history of **sd-NVP** whose first line regimen must be **LPV/r**-based, and who eventually fail such a regimen, should have a genotypic resistance assays performed for discussion with an HIV Specialist, since any NNRTI-based second line regimens may very likely be ineffective.
 - Do not wait for more than four weeks for return of the resistance assay before changing the regimen under Specialist guidance.

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Longitudinal Monitoring

- **ART Efficacy**
 - Immunological response: increase in CD4 values (*CD4 values may fluctuate widely over time: confirm any unusual value before changing regimen*)
 - Virological response: decrease in viral load to < 400 copies/mL by 6 months after HAART initiation
- **Clinically**
 - Weight, height, head circumference (if <2 years)
 - Developmental stages every 3 months
 - Assess for potential side effects
- **Adherence**
 - Need for designated caregivers responsible for ART
 - Assess family situation at every visit.

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Laboratory/Clinical Monitoring Schedule for Pediatric and Adolescent Patients

- Clinical monitoring: every 3 months
- CD4% and absolute count at 3 and 6 months post-initiation, then every 6 months thereafter (same as for adults)
- *Viral load every 3 months* (more frequent for children and adolescents than with adults because of high failure rates in these patients)
- FBC, AST/ALT: same as for adults
- Lab and clinical monitoring should be more frequent if clinical condition worsens.
- Laboratories must give priority status to viral loads in all patients under 20 years of age.

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AIDS CLINICAL CARE FUNDAMENTALS

Pediatric First Line Regimen: <u>Unchanged (AZT+3TC+NNRTI)</u>								
	Baseline	2 wks	1 mo	3 mos	6 mos	9 mos	12 mos	Thereafter
CD4 count and CD4%	✓			✓	✓		✓	q 6 months
Viral load	<u>NONE</u>			✓	✓	✓	✓	<u>q 3 months</u>
FBC	✓		✓	✓			✓	q 12 months
Chemistry	✓							As indicated
AST/ALT	✓	✓ NVP	✓	✓				As indicated
Growth & development	✓	Weight only	✓	✓	✓	✓	✓	q 3 months

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Pediatric 1st Line Regimen Modified for Exposure to sd-NVP: AZT + 3TC + LPV/r								
	Baseline	2 wks	1 mo	3 mos	6 mos	9 mos	12 mos	Thereafter
CD4 count and CD4%	✓			✓	✓		✓	q 6 months
Viral load	<u>NONE</u>			✓	✓	✓	✓	<u>q 3 months</u>
FBC	✓		✓	✓			✓	q 12 months
Chemistry	✓							As indicated
AST/ALT	✓							As indicated
Glucose, TC/TG	✓							q 12 months
Growth & development	✓	Weight only	✓	✓	✓	✓	✓	q 3 months

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New Pediatric Second Line Regimen: ABC + d4T + LPV/r							
	At switch	1 mo	3 mos	6 mos	9 mos	12 mos	Thereafter
CD4 count	If not done in prior 6 mos		✓	✓		✓	q 6 months
Viral load	N.A.		✓	✓	✓	✓	<u>q 3 months</u>
FBC	If not done in prior year					✓	q 12 months
Chemistry	As with FBC						As indicated
AST/ALT	As with FBC						As indicated
Glucose, TC, TG	✓					✓	q 12 months
Growth & development	✓	✓	✓	✓	✓	✓	q3 months

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**When to Change a Regimen:
The Same as for Adults**

- Virologic Failure: the same definition as for adults
 - Viral load is not < 400 copies/ml by 6 months after treatment initiation
 - Viral load rebound later in the future after initial suppression
 - All pediatric patients whose viral load is not < 400 copies/mL by 6 months after initiation of ARV therapy must be discussed with a pediatric HIV Specialist.
- Toxicity or severe side effects: change only the offending ARV.
 - Obtain priority viral load 6 weeks after the switch, to ensure continued virologic suppression.

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When to Change a Regimen (2)

- Do not switch antiretroviral therapy on the basis of a declining CD4 count/% if the viral load is undetectable.
- Discuss potential regimen changes with a pediatric HIV specialist in cases of growth failure, disease progression, neurodevelopmental problems or disease progression in the absence of virologic failure.

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Special Issues in Adolescent Care

- Pharmacokinetics of ARVs during the adolescent period are not always predictable, and there is increased risk of treatment failure due to variable drug levels in these patients.
- ARVs should be dosed according to pubertal development.
 - Children and adolescents who are pre-pubertal and early pubertal should be dosed according to pediatric guidelines.
 - Adolescents who have completed puberty or are near the end of puberty may be given adult doses.

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Tanner Stage and ARV Dosing

At adolescence, ARVs should be dosed according to Tanner Staging:

- Children and adolescents who are tanner stage 1 or 2 (pre-pubertal and early pubertal) should be dosed according to pediatric guidelines.
- When tanner stage 5 has been reached, adult dosing should be used.
- Tanner stages 3 and 4 are periods of rapid growth for most adolescents. In most cases, pediatric dosing (weight-based or body-surface-area based) will be appropriate until the growth spurt is complete.
 - Because of concerns about effects on bone mineral density, **TDF** should be used in adolescents only at Tanner stage 4 or higher.

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Tanner Staging

Female		Male	
Age Range (Years)		Age Range (Years)	
8-15		10-15	
10-15		10.5-16.5	
10-17		Variable: 12-17	
12.5-18		15-18	

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Efavirenz and Menarche

- Potential teratogenicity of efavirenz must be considered once a girl who is on EFV develops childbearing potential. If there is a risk of pregnancy in the near future, then switch to NVP is necessary.
- When the CD4 count is high (> 250 cells/μL) at time of switch to NVP, monitor closely for any NVP-associated side effects, and educate the patient and caregiver accordingly.
- Counseling about the risk of teratogenicity must always be done, if the patient is continued on EFV.
- Always consider whether the risk of unintended pregnancy on EFV outweighs the risk of toxicity from switching to NVP at high CD4 counts.

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Pediatric ARV Dosing

- Infants and children have immature liver and kidney function, and their body metabolism changes as growth and development occurs.
- Accordingly, ARV dosages depend on the infant's/child's body weight or body surface area:
 - In children, most ARVs are dosed by body weight: **3TC, NVP, EFV, d4T, LPV/r**
 - A few ARVs are dosed by body surface area (BSA) in m²: **AZT, ddl**

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Principles of Dose Calculation

- Calculations of ARV drug doses for infants and children involve the same general principles as dosage calculations for other drugs:
 - ARV drug dosed on body weight
 - Patient dose = recommended dose in mg/kg X patient weight in kg.
 - ARV drug dosed on body surface Area (BSA)
 - Patient dose = recommended dose in mg/m² X patient BSA in m².

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Pediatric Dosing: 2008 Guidelines

- Previously, pediatric dosing required specific calculations for each ARV, using either patient weight or BSA.
- Under the 2008 guidelines, pediatric dosing has been simplified. Doses should be determined from WHO pediatric dosing tables. Calculating doses is not routinely necessary.
- In order to allow patients to be dosed using pill formulations rather than a combination of pills and syrups, "split dosing" is sometimes used, e.g., one tablet in the morning and ½ a tablet in the evening
 - Split dosing for children has been determined to be effective and acceptable.

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Dosing Exercise

- Using WHO dosing cards, determine the most appropriate medication doses for the following child:
 - 2 years old
 - Beginning 1st line HAART today
 - Her mother did not receive PMTCT
 - Hemoglobin 11.3
 - Weight 10.5kg, height 82cm*

*Note that the height is not necessary for calculating the dose using the dosing cards. If you want to double-check your dosing by calculating the dose, you can use the height to determine the child's body surface area.

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Weight range (kg)	Zidovudine (Retrovir [®] , ZDV, AZT)		Nevirapine (Viramond [®] , NVP)				Lamivudine (Epivir [®] , 3TC)		
	180-240 mg/kg/7days TWICE daily		INDUCTION 8Wks: 160-200 mg/kg/7days ONCE daily		MAINTENANCE 8Wks: 160-200 mg/kg/7days TWICE daily		4 mg/kg/day TWICE daily		
	10 mg/ml syrup	100 mg capsules	150 mg tablets	18 mg/ml suspension	200 mg tablets	10 mg/ml suspension	200 mg tablets	10 mg/ml solution	150 mg tablets
5 - 5.9	6 ml			6 ml		6 ml		3 ml	
6 - 6.9	7 ml			7 ml		7 ml		3 ml	
7 - 7.9	8 ml			8 ml		8 ml		4 ml	
8 - 8.9	9 ml	1 cap		9 ml		9 ml		4 ml	
9 - 9.9	12 ml	1 cap		9 ml	0.5 tab	9 ml	0.5 tab	4 ml	
10 - 10.9	15 ml	1 cap		10 ml	0.5 tab	10 ml	0.5 tab	5 ml	

2 year old child
10.5kg

Initiating 1st line HAART:
 zidovudine (AZT)
 lamivudine (3TC)
 nevirapine (NVP)

AZT 100mg (10mls) BD
 3TC 50mg (5mls) BD
 NVP 100mg (10mls) OD

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Dosing Exercise (2)

- The child described in the previous exercise is now 8 years old and still doing well on 1st line HAART. She now weighs 19kg and her height is 115cm.
- What ARV doses should be prescribed now?

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Summary

- Diagnosis of HIV Infection in babies under 18 months is by DNA-PCR. If the initial DNA PCR returns positive, do not wait for the confirmatory test before beginning HAART.
- All HIV-infected children under 1 year of age require antiretroviral therapy and CTX prophylaxis.
- Children under 18 months of age who are awaiting laboratory confirmation of HIV-infection should be clinically staged monthly, to determine if empiric antiretroviral therapy under HIV Specialist guidance is needed.

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Summary (2)

- Babies who were exposed to sd-NVP are at increased risk of failing standard NNRTI-based therapy, and LPV/r should be used instead.
- Monitoring schedules for adults and children on antiretroviral therapy are similar, with the major exception that viral loads must be checked every 3 months in children and adolescents.
- Adherence is a special challenge in children and adolescents (Lecture 6).

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