



Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection

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Table 17i. Antiretroviral Therapy-Associated Adverse Effects and Management Recommendations—Nephrotoxic Effects (Last updated November 1, 2012; last reviewed November 1, 2012)

Adverse Effects	Associated ARVs	Onset/Clinical Manifestations	Estimated Frequency	Risk Factors	Prevention / Monitoring	Management
Urolithiasis/nephrolithiasis	IDV, ATV	<u>Onset:</u> Weeks to months after starting therapy <u>Clinical findings:</u> Crystalluria, hematuria, pyuria, flank pain, sometimes increased creatinine	IDV-related nephrolithiasis is more common in adults (4%–43%) than in children (0%–20%). ATV nephrolithiasis rare	In adults, high serum IDV concentrations and elevated urine pH (>5.7) associated with persistent pyuria. Unknown in children.	<u>Prevention:</u> Maintain adequate hydration. <u>Monitoring:</u> Obtain urinalysis at least every 6–12 months.	Provide adequate hydration and pain control; consider using alternative ARV agent.
Renal dysfunction	TDF	<u>Onset:</u> Variable; in adults, weeks to months after initiation of therapy. Hypophosphatemia appears at a median of 18 months. <u>Presentation:</u> Renal failure, acute tubular necrosis, Fanconi syndrome, proximal renal tubulopathy, interstitial nephritis (including acute cases), nephrogenic diabetes insipidus, renal insufficiency, increased creatinine, proteinuria, polyuria	<u>Adults:</u> ~2% with increased serum creatinine; ~0.5% with severe renal complications <u>Children:</u> ~4% with hypophosphatemia or proximal tubulopathy; 25% to 78% with severe proteinuria (may be confounded by advanced HIV infection in children studied, and concomitant use of ddl)	Risk may be increased in children aged >6 years, black race, Hispanic/Latino ethnicity, and by advanced HIV infection, concurrent use of ddl or PIs (especially LPV/r), and pre-existing renal dysfunction).	<u>Urinalysis, measurement of serum creatinine, calcium, and phosphorus and determination of spot urine protein/creatinine ratios at least every 6–12 months.</u>	If TDF is the likely cause, consider using alternative medication.
	IDV	Renal cortical atrophy, acute renal failure	Rare	Unknown	Unknown	If IDV is likely cause, consider using alternative medication.

Key to Acronyms: ARV = antiretroviral, ATV = atazanavir, ddl = didanosine, IDV = indinavir, LPV/r = lopinavir/ritonavir, PI = protease inhibitor, TDF = tenofovir disoproxil fumarate

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