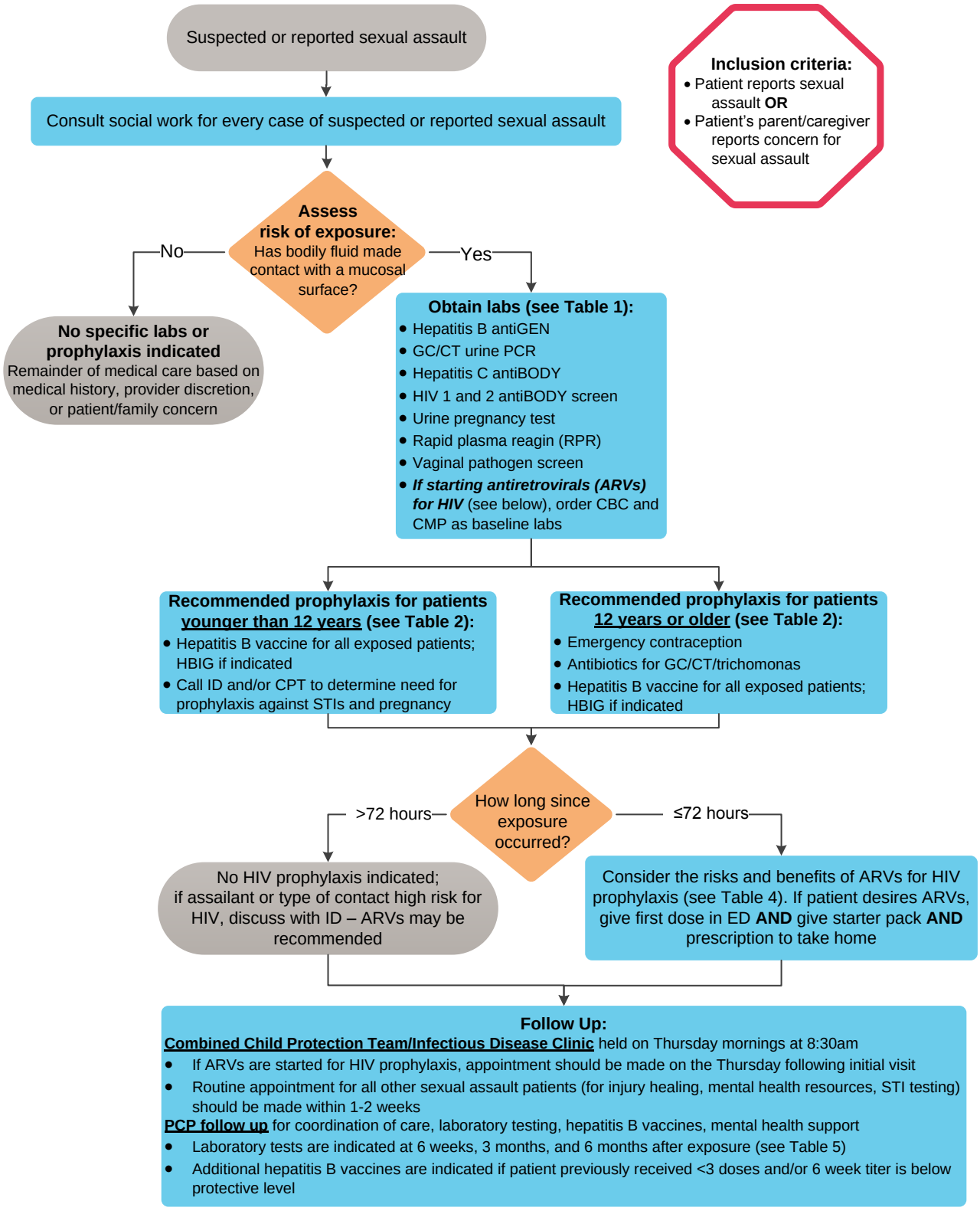
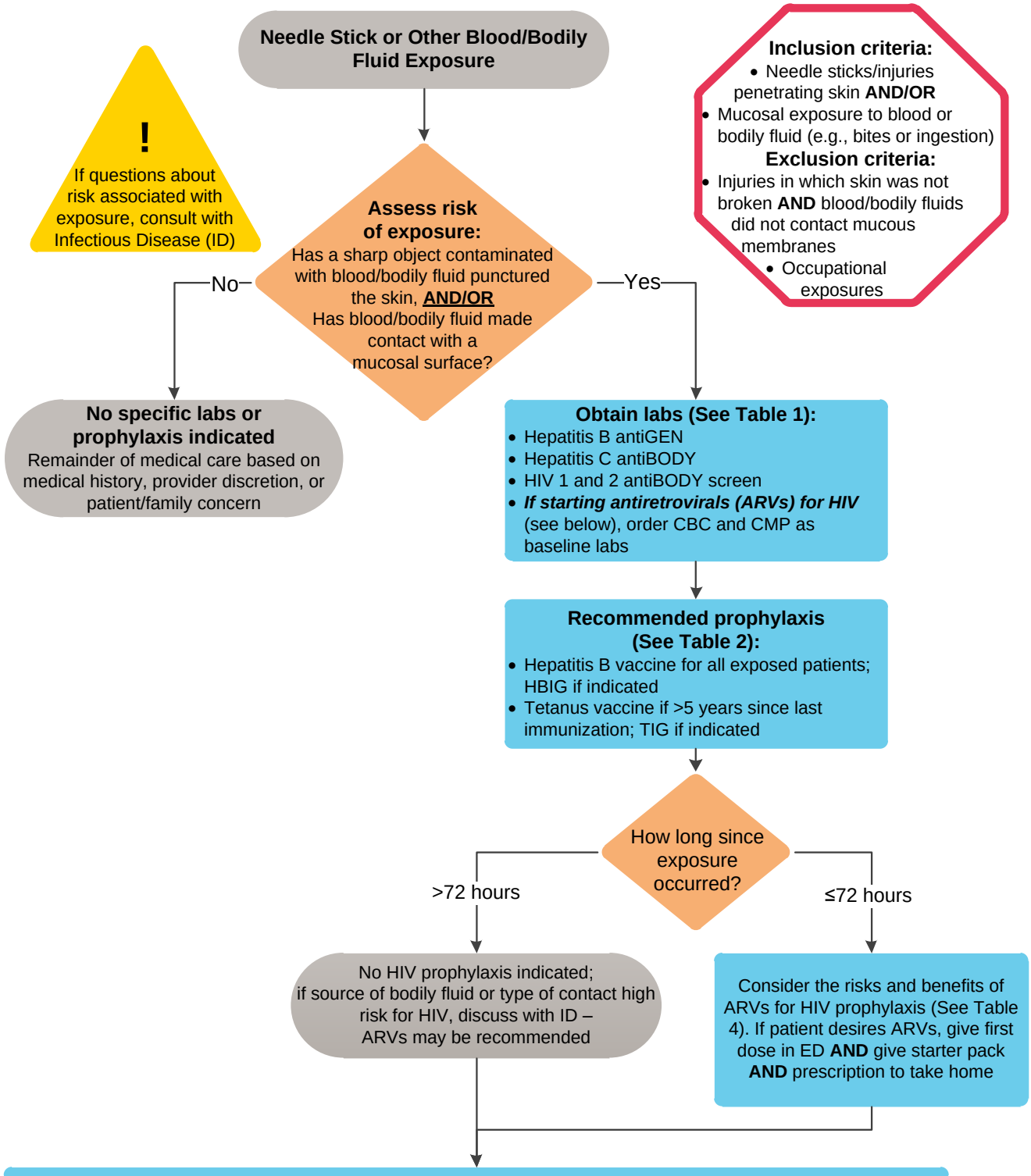
COMMUNITY (NON-OCCUPATIONAL) BLOOD OR BODILY FLUID EXPOSURE

ALGORITHM 1. Sexual Assault



ALGORITHM 2. Needle Stick or Other Bodily Fluid Exposure



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TARGET POPULATION: SEXUAL ASSAULT

Inclusion Criteria

- Pediatric patients reporting sexual assault—defined as any forced or coerced sexual behavior that occurs without consent, **AND/OR**
- Pediatric patients whose parents report concern for sexual assault

Exclusion Criteria

- Severe physical trauma necessitating emergent operation or repair (Must address trauma first, proceed with workup and prophylaxis once stable. Alert CPT and/or ID to pending need for workup and prophylaxis).

TARGET POPULATION: NEEDLE STICK INJURY / OTHER BLOOD OR BODILY FLUID EXPOSURE

Inclusion Criteria

- Needle sticks that penetrate the skin, due to discarded needles found in a community setting, **AND/OR**
- Other injuries that penetrate that skin, due to any sharp object contaminated with blood or bodily fluids, **AND/OR**
- Mucosal exposure to blood or bodily fluid, such as a bite injury, or ingestion of any material contaminated with blood or body fluid

Exclusion Criteria

- Any injury in which skin was not broken AND blood/bodily fluids did not contact mucous membranes
- Occupational needle sticks or other injuries or exposures that occur in a workplace setting (refer to Occupational Health Services – Management of Blood and Bodily Fluid Exposures (OHS-001).

BACKGROUND | DEFINITIONS

These clinical care recommendations are designed to help medical providers identify, screen, and treat children at-risk of transmission of infectious agents from blood or bodily fluid exposure in the community (including community needle sticks and sexual exposures).

Definitions

ARV: Antiretroviral drugs

CPT: Child Protection Team

HIV: Human Immunodeficiency Virus

ID: Infectious Diseases

PEP: Post-Exposure Prophylaxis

STI: Sexually Transmitted Infection

INITIAL EVALUATION: SEXUAL ASSAULT

Prior to evaluation of unconscious, intoxicated, or altered patients, consult with CPT.

History

- Details of exposure
  - Type of sexual contact
  - Mucosal surface(s) involved
- Patient factors
  - Pubertal status
  - Vaccination status for hepatitis B
- Assailant risk factors
  - Is the assailant known to be infected with HIV, hepatitis B, or hepatitis C?
  - Does the assailant agree to be tested for HIV, hepatitis B, or hepatitis C?

Physical Exam

- Perform a comprehensive physical exam, noting any injuries that could increase the risk of exposure
- Exam should be performed by a trained provider

INITIAL EVALUATION: NEEDLE STICKS AND OTHER EXPOSURES

History

- Details of exposure
  - In what setting was the contaminated object or material found?
  - If needle stick, was blood visible in the syringe? Was the sharp hollow bore or solid?
- Patient factors
  - Vaccination status for tetanus
  - Vaccination status for hepatitis B
- If the source of blood/body fluid is known:
  - Is the source known to be infected with HIV, hepatitis B, or hepatitis C?
  - Does the source agree to be tested for HIV, hepatitis B, or hepatitis C?

- If the source of blood/body fluid is unknown:
  - Blood from discarded needles should NOT be tested for viral infections.

Physical Exam

- Perform a comprehensive physical exam, noting any injuries
- Document the location and severity of any wounds that penetrated skin.

CLINICAL MANAGEMENT

Laboratory Studies

Labs indicated for: Patients with a blood or bodily fluid exposure of ANY TYPE, including sexual assault

- Hepatitis B AntiGEN – to rule out infection prior to current exposure. Hepatitis B antiBODY is not indicated, as Hepatitis B vaccination is recommended for all exposed patients, regardless of antibody titers[1]
- Hepatitis C AntiBODY – to rule out infection prior to current exposure
- HIV 1 and 2 AntiBODY screen – to rule out infection prior to current exposure

Labs indicated for: Patients with known or suspected oral, vaginal, penile, or anal sexual contact

- Gonorrhea/Chlamydia (GC/CT Urine PCR) – culture was previously gold standard, but PCR is sufficiently sensitive to make a diagnosis. Ensure that patient does not clean their genitals prior to collecting urine sample.
- RPR – screening test for syphilis
- Urine Pregnancy Test – to determine whether patient was already pregnant at time of suspected assault, as it would be too early to diagnose new pregnancy
- Vaginal Pathogen Screen – screening test for yeast, bacterial vaginosis, and trichomonas

Labs indicated for: Patients who will be starting ARVs for HIV post-exposure prophylaxis

- Complete Blood Count (CBC) with differential – to provide a baseline; if patient is severely neutropenic, anemic, or thrombocytopenic, call ID.
- Comprehensive Metabolic Panel (CMP) – to provide a baseline; if renal function is abnormal or liver enzymes are elevated, call ID.

TABLE 1: Recommended Immediate Testing after Exposure

	ALL At-Risk Exposures					**ADD IF Sexual Exposure**				**ADD IF Starting HIV PEP**	
	Hep B Surface AntiGEN	Hep C Ab	HIV 1 and 2 Ab screen	HIV RNA PCR	Chemistry Hold serum + plasma	Urine GC/CT PCR*	RPR	Preg Test	Vaginal pathogen screen	CBC with diff	CMP
Source[#] (If available)	X	X	X	X	X	X	X				
Exposed Patient	X	X	X		X	X	X	X	X	X	X

* Performance characteristics of the urine GC/CT PCR have not been established for children 13 years of age and younger.

[#] "Source" is defined as the person whose blood or bodily fluids contacted the patient. In the case of sexual assault, "source" refers to the assailant. In the case of a needle stick, blood from a syringe should never be tested for infections.

Prophylaxis

Prophylaxis for patients with a blood or bodily fluid exposure of ANY TYPE, including sexual assault:

- HIV – consider PEP after discussion of risks/benefits (see pages 8-10)
- Hepatitis B – give vaccine to all exposed patients. Give Hep B Immune Globulin (HBIG) only if the exposed patient is unvaccinated, has received <3 doses of vaccine, or vaccination status is unknown, AND source is KNOWN TO BE INFECTED with hepatitis B[1,2].
- Hepatitis C – no prophylaxis is available.
- Tetanus – vaccine is indicated for needle stick or wound, if most recent tetanus vaccine was >5 years ago. Give Tetanus Immune Globulin (TIG) only if the exposed patient is unvaccinated, has received <3 doses of vaccine, or vaccination status is unknown[3].

Prophylaxis against STIs and pregnancy for post-pubertal children (≥ 12 years old) with known or suspected sexual exposure:

- Gonorrhea – all patients ≥ 12 years old with sexual exposure (do not await results of PCR testing)
  - Weight < 45 kg- Ceftriaxone IV/IM 125 mg once
  - Weight > 45 kg- Ceftriaxone IV/IM 250 mg once
  - If renal insufficiency, please contact ID for alternative
- Chlamydia – all patients ≥ 12 years old with sexual exposure (do not await results of PCR testing)
  - Weight < 50 kg- Azithromycin 20 mg/kg PO once
  - Weight > 50 kg- Azithromycin 1000 mg PO once
- Trichomonas – female patients ≥ 12 years old with positive vaginal pathogen screen
  - Metronidazole 2000 mg PO once
- Pregnancy – female patients with negative pregnancy test, <120 hours since sexual contact
  - Ulipristal (Ella®) 30 mg PO once

Prophylaxis against STIs and pregnancy for pre-pubertal children (< 12 years old) with known or suspected sexual exposure:

- Call ID and/or CPT for all sexual assaults in patients less than 12 years of age to determine the need for STI and/or pregnancy prophylaxis.
- If prophylaxis is not administered after discussion with ID and/or CPT, perform all screening labs and PCP should follow up on these labs and treat if necessary. Labs can be repeated at 6 weeks post exposure or sooner if symptomatic.

TABLE 2: Recommended Prophylaxis for Exposed Patients

Condition	Population Indicated			Prophylaxis
HIV	Patient/parent decision after discussion of risks/benefits (see pp. 8-10)			HIV PEP regimen PO x4 weeks
Hepatitis B	All exposed patients, even if fully vaccinated			Hep B vaccine
	Patients who are unvaccinated against Hep B, received <3 doses of Hep B vaccine, or vaccination status unknown	**AND**	Source is KNOWN TO BE INFECTED with Hep B	Hep B vaccine ***PLUS*** Hep B Immune Globulin (HBIG) 0.06 mL/kg IM
Hepatitis C	None			None
Tetanus	Needlestick/Wounds: more than 5 years since most recent tetanus vaccine			Tetanus vaccine only
	Needlestick/Wounds: unvaccinated or <3 doses tetanus vaccine			Tetanus vaccine ***PLUS*** Tetanus Immune Globulin (TIG) 250 Units IM
Gonorrhea*	Sexual Exposure, weight less than 45 kg			CefTRIAXone IV/IM 125 mg once
	Sexual Exposure, weight greater than 45 kg			CefTRIAXone IV/IM 250 mg once
Chlamydia*	Sexual Exposure, weight less than 50 kg			Azithromycin PO 20 mg/kg once
	Sexual Exposure, weight greater than 50 kg			Azithromycin PO 1000 mg once
Trichomonas*	Sexual Exposure, positive vaginal pathogen screen			Metronidazole PO 2000 mg once
Pregnancy	Sexual Exposure (within 120 hours), negative pregnancy test, patient choice			Ulipristal (Ella®) PO 30 mg once

*** For patients under 12 years of age, call ID and/or CPT to determine the need for prophylaxis.**

HIV Post-Exposure Prophylaxis (PEP)

The risk of HIV transmission varies greatly depending on the particular exposure. Given that each exposure is unique in its risk profile, a discussion of the risks of transmission, potential benefits of PEP, and potential complications of PEP with the patient/parents is recommended using the information provided below. Please call the on-call infectious diseases provider for help with PEP recommendations.

Potential Benefits of HIV Post-Exposure Prophylaxis

The potential benefit of HIV PEP depends on the efficacy of the regimen, timing of PEP initiation after exposure, and adherence to the entire regimen.

1. **Efficacy of Regimen**: PEP using single-drug therapy following occupational exposure decreases transmission by 81%[1]. Experts now recommend the use of a multi-drug regimen with more potent antiretroviral agents, which is likely to increase this efficacy.
2. **Timing of Exposure:** PEP is most effective when begun as soon as possible after exposure and becomes less effective as time from exposure increases. PEP is less likely to be effective 72 hours after exposure, but the interval after which no benefit is gained is unknown[1]. If >72 hours have passed since exposure to a source whose HIV status is unknown, PEP is not recommended; however, testing per Table 1 should still be conducted. If >72 hours have passed since exposure to a source who is known to be HIV infected, please contact ID for recommendations on PEP.

3. **Adherence to PEP:** The efficacy of PEP depends upon adherence to the entire 28-day course of medication. The most common reason for PEP discontinuation is side effects. Although side effects of PEP regimens are common, they are rarely severe or serious (see Table 3 for regimen-specific side effects). The side effect profile of newer antiretrovirals is improved compared with older drugs.

PEP Drug Regimens

All regimens are FOUR WEEKS in duration. Prescribe 7 days of ondansetron (Zofran®) with every PEP regimen to ensure tolerability.

A. **12 years or older and weight at least 40 kg:** Prescribe **both of** the medications listed below:

Medication	Dose
Truvada® (tenofovir 300 mg/ emtricitabine 200 mg; TDF/FTC)	1 tablet PO once daily
Raltegravir 400 mg tablet (RAL)*	1 tablet PO TWICE daily

*These medications should be given with a full meal. Absorption is impaired by simultaneous administration of medications that contain polyvalent cations, such as antacids, laxatives, or multivitamins, UNLESS they are taken with food.

B. **Younger than 12 years and/or weight less than 40 kg:** Prescribe **all three** medications listed below:

1. Can swallow pills:

Medication	Strength	Weight	AM dose	PM dose
Lamivudine (3TC)	150 mg tablet	14-20 kg	75 mg	75 mg
		21-25 kg	75 mg	150 mg
		≥25 kg	150 mg	150 mg
Zidovudine (AZT, ZDV)	100 mg capsule	21-30 kg	200 mg	200 mg
		≥30 kg	300 mg	300 mg
Raltegravir (RAL)*	100 mg chew tab	14-19 kg	100 mg	100 mg
		20-27 kg	150 mg	150 mg
		28-39 kg	200 mg	200 mg
		≥40 kg	300 mg	300 mg

*These medications should be given with a full meal. Absorption is impaired by simultaneous administration of medications that contain polyvalent cations, such as antacids, laxatives, or multivitamins, UNLESS they are taken with food.

2. Cannot swallow pills:

Medication	Strength	Weight	Dose (given BID)	Max dose
Lamivudine (3TC)	10 mg/ml liquid	≤40 kg	4 mg/kg/dose	150 mg/dose
Zidovudine (AZT, ZDV)	10 mg/ml liquid	4-8 kg	12 mg/kg/dose	300 mg/dose
		9-29 kg	9mg/kg/dose	
		≥30 kg	300 mg	
Raltegravir (RAL)*	100 mg chew tab dissolved in 5 mL water[#]	3-3.9 kg	20 mg (1 ml)	N/A
		4-5.9 kg	30 mg (1.5 ml)	
		6-7.9 kg	40 mg (2 ml)	
		8-10.9 kg	60 mg (3 ml)	
		11-13.9 kg	80 mg (4 ml)	
		14-19.9 kg	100 mg (5 ml)	

*These medications should be given with a full meal. Absorption is impaired by simultaneous administration of medications that contain polyvalent cations, such as antacids, laxatives, or multivitamins, UNLESS they are taken with food.

[#] RAL chew tabs dissolve in water after ~15 minutes. The tablet should be fully dissolved before administration.

TABLE 3. Common Side Effects Experienced with the Recommended PEP Regimens

Intended patients	PEP regimen	Adverse Effects
≥12 years and ≥40 kg	Truvada® / raltegravir	Common but mild: fatigue, dizziness, insomnia, headache, nausea, diarrhea, liver enzyme elevation. Rare but severe: muscle pain due to myositis.
<12 years and/or <40 kg	Lamivudine / zidovudine / raltegravir	Common but mild: fatigue, dizziness, insominia, headache, nausea, diarrhea, anemia, neutropenia, liver enzyme elevation, rash. Rare but severe: muscle pain due to myositis.

RISK OF TRANSMISSION

Risk of transmission of HIV or hepatitis B or C is based on the probability that the source was infected, the viral load of an infected source, and the type of exposure.

1. Probability source was infected:
    a. HIV: As of 2015, the seroprevalence of HIV in Colorado is 0.24% (239.2 HIV-infected persons per 100,000 people)[4]. Certain risk groups, including sexual assailants, injecting drug users, and men who have sex with men have a higher seroprevalence. Seroprevalence also varies by county, with higher rates in Denver metro and El Paso counties[4].
    b. Hepatitis B: The Colorado Dept. of Public Health and Environment estimates that there are currently about 16,370 (range of 10,913 to 21,826) people in Colorado living with chronic HBV. This estimate is based on the U.S. Census 2015 Colorado population estimated population and a national published HBV prevalence rate estimate of 0.3% (range of 0.2%-0.4%)[4].
    c. Hepatitis C: The Colorado Dept. of Public Health and Environment estimates that there are currently about 70,935 (range of 54,566 to 109,131) people in Colorado living with chronic, unresolved HCV. This estimate is based on the U.S. Census 2015 Colorado population estimated population and a national published HCV prevalence rate estimate of 1.3% (range of 1.0% to 2.0)[4].
2. Risk of HIV Transmission Based on Type of Exposure[1] – See Table 4 on the next page.

TABLE 4. Risk of HIV Transmission Based on Exposure Type

Exposure Type	Transmission Risk per Exposure to a Known HIV Positive Source	Comments
Exposure to Contaminated Sharp		
Accidental needle stick	0.23% *(1 per 435)*	• Discarded needles are low-risk exposures, as HIV is intolerant to environmental conditions. There has never been a reported case of HIV transmission from a discarded needle, as of 2016. • Risk of transmission from a needle stick depends on the bore of the needle and depth of penetration. • Discarded small bore needles (i.e. insulin syringes) or solid sharps (i.e. scalpels) with shallow penetration from a low risk population (i.e. diabetics) would be of very low risk. • Newly discarded hollow bore needles with visible blood from areas frequented by high HIV seroprevalent populations (i.e. injecting drug users) would be of higher risk.
Needle-sharing during injection drug use	0.63% *(1 per 159)*	
Sexual Exposures		
Receptive anal intercourse	1.38% *(1 per 72)*	• Risk of HIV transmission due to sexual assault or abuse associated with trauma, bleeding, and tissue injury is significantly higher than that of consensual sexual contact. • Although oral sex with intact mucosa is a low risk transmission event, the presence of oral sores or mucosal injuries increases the risk of transmission. • Most experts would recommend PEP in cases of sexual assault or abuse, or sexual contact with a known HIV-positive source.
Receptive vaginal intercourse	0.08% *(1 per 1,250)*	
Insertive anal intercourse	0.11% *(1 per 909)*	
Insertive vaginal intercourse	0.04% *(1 per 2,500)*	
Oral sex with ejaculation	Low risk	
Mucous Membrane Exposures		
Oral exposure to blood	Negligible	• Biting: HIV transmission from bites is extremely rare. A bite without a break in the skin is not considered an exposure. A bite involving a high-risk source with breaks in the skin and blood exposure increases transmission risk. • Kissing/ Mouth to Mouth Resuscitation: Should not be considered an exposure without mucosal damage or blood exposure. • Saliva contaminated with blood poses a substantial exposure risk. HIV transmission by this route has been reported.
Non-intact Skin Exposures		• Rare cases of HIV transmission after non-intact skin exposure to infected blood have been documented, but the risk has not been quantified.

DISCHARGE PLANNING CHECKLIST

LABS

[ ] Obtain proper laboratory studies (see Table 1):

All Exposures
- [ ] Hep B Surface AntiGEN
- [ ] Hep C Antibody
- [ ] HIV 1 and 2 Antibody Screen

Sexual Exposure
- [ ] GC/CT PCR
- [ ] RPR for Syphilis
- [ ] Pregnancy Test
- [ ] Vaginal Pathogen Screen

Starting HIV PEP
- [ ] CBC with differential
- [ ] CMP

PROPHYLAXIS

[ ] Provide prophylaxis for Hepatitis B, tetanus, GC/CT, trichomonas, and/or pregnancy as indicated in Table 2.

[ ] Discuss risks/benefits of HIV PEP (pp. 8-10). If starting PEP:

[ ] Give **FIRST DOSE** of ARVs in the Emergency Department with ondansetron (Zofran®) 4mg PO once.

[ ] Call inpatient pharmacy to obtain **PEP STARTER PACK** (Free 7-day supply of ARVs dispensed from Children's Hospital Colorado pharmacy, intended to bridge patient until follow-up in ID/CPT clinic.) Patient should LEAVE THE ED WITH STARTER PACK in hand.

[ ] Write a 7-day **PRESCRIPTION FOR ONDANSETRON** (Zofran®).

[ ] Write a 28-day **PRESCRIPTION FOR ARVs**. Instruct patient NOT TO FILL PRESCRIPTION unless directed by ID or CPT. Walgreens within CHCO is the preferred pharmacy for ARV prescriptions.

FOLLOW-UP

[ ] **Schedule follow up in ID and/or CPT clinics** via one of the following:

1) EPIC in-basket message (link in discharge SmartSet; preferred method)
2) Fax the PEP Follow-Up Request Form to 720-777-7295 (see attached)

Victims of sexual assault on HIV PEP should follow up THIS THURSDAY at 8:30am in combined ID/CPT clinic.
Victims of sexual assault NOT on HIV PEP should follow up within 2 weeks in CPT clinic.
Victims of needle sticks or other exposures on HIV PEP should follow up within 7 days in ID clinic. (If not on HIV PEP, these patients should follow up with PCP only; see guidance below.)

[ ] **Notify Social Work** of all cases of confirmed or suspected sexual assault.

[ ] **Contact Information:** Confirm preferred patient contact information, including **confidential contact number** if adolescent sexual assault. List both in Demographics section of chart and on PEP Follow-Up Request Form, if using.

[ ] Give copy of **PATIENT/PARENT EXPOSURE HANDOUT**.

[ ] **PCP Follow-Up** is important for coordination of care, follow-up laboratory testing, vaccines, and mental health support. Follow-up tasks include labs as per Table 5, and vaccines as follows:

- HPV vaccines should be administered according to the routine 3-dose series.
- Hepatitis B vaccines may be indicated to complete the 3-dose series (see CDC catch-up immunization schedule)[2]. Indications for additional Hepatitis B vaccines:
  - Patient determined to be unvaccinated/undervaccinated against hepatitis B prior to the exposure
  - Hepatitis B surface antibody at 6 weeks is below the protective level

TABLE 5: Recommended Follow-Up Labs

	ALL EXPOSURES				SEXUAL EXPOSURES		
	Hep B Surface AntiGEN	Hep B Surface AntiBODY	Hep C Ab	HIV 1 and 2 Ab screen	GC/CT PCR	RPR	Pregnancy Test
6 Weeks		X		X	X*	X	X#
3 Months				X			
6 Months	X$	X$	X	X		X	

* Only if did NOT receive prophylaxis against GC/CT during initial visit.
# Only if did NOT receive emergency contraception during initial visit.
$ Only if 6 week Hep B Surface Antibody is undetectable.

COMMUNITY (NON-OCCUPATIONAL) BLOOD AND/OR BODILY FLUID EXPOSURE

Post-Exposure Prophylaxis Clinic Follow-Up Request:

FAX TO: 720-777-7295

This form required ONLY if ID or CPT teams were NOT notified by EPIC in-basket message

Patient Name (Last, First): _____
Date of Birth: _____ **MR#** _____ **Patient Weight:** _____
Patient Address: _____
Phone #: _____**(H)** _____**(C)**
Preferred Confidential Phone # (if adolescent sexual exposure):_____
Insurance:_____ **Other ID #:** _____
Primary Care Physician: _____ **PCP Phone Number:** _____
Exposure Date/Time:_____
Brief Description of Exposure:

HIV PEP:

PEP started? [ ] yes [ ] no
If yes, regimen prescribed:

Drug	Dose
_____	_____
_____	_____
_____	_____

First Dose Given in ED [ ] yes [ ] no
Starter Pack Given [ ] yes [ ] no
28-Day Prescription Given [ ] yes [ ] no

[ ] CBC/diff

WBC	
Hct	
Plts	

[ ] LFTs

AST	
ALT	
T bili	

[ ] BUN/Cr

BUN	
Cr	

Other Lab Work/Prophylaxis:

[ ] HIV Antibody [ ] positive [ ] negative [ ] pending
[ ] STD screen sent (sexual exposures)
[ ] RPR [ ] Chlamydia [ ] Gonorrhea [ ] Trichomonas
[ ] Prophylaxis given:

Drug	Dose/Duration
_____	_____
_____	_____
_____	_____

[ ] Pregnancy Screen (sexual exposures) [ ] positive [ ] negative
[ ] Emergency Contraception given [ ] yes [ ] no
[ ] Hepatitis Screen
Hep B AntiGEN [ ] positive [ ] negative [ ] pending
Hep C AntiBODY [ ] positive [ ] negative [ ] pending
Hepatitis B Vaccine given [ ] yes [ ] no
If SOURCE is KNOWN TO BE Hepatitis B positive:
Hepatitis B Immune Globulin given [ ] yes [ ] no
[ ] Tetanus Vaccine [ ] up-to-date [ ] vaccine given [ ] TIG given

Treating Provider Name: _____ **Pager #:**_____

Date: _____ **Time:** _____

PATIENT | CAREGIVER EDUCATION

- Sexual Assault and Possible Exposure to Disease: For Teen
  - English
  - Spanish
- Sexual Assault and Possible Exposure to Disease: For Parent of Child
  - English
  - Spanish
- Needle Sticks and Other Exposure to Blood
  - English
  - Spanish

REFERENCES

1. Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV - United States, 2016.
2. American Academy of Pediatrics. [Hepatitis B.] In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2015:[400-423]
3. American Academy of Pediatrics. [Tetanus.] In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2015:[773-778]
4. Colorado Department of Public Health and Enviornment Data Request System, November 2016.

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APPROVED BY

Clinical Pathways and Measures Committee – April 11, 2017
Antimicrobial Stewardship – March 2017
Pharmacy & Therapeutics Committee – May 4, 2017, medication change approved on November 2, 2017

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APPROVED BY	 Medical Director, Clinical Effectiveness

REVIEW | REVISION SCHEDULE

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