

Recommendations for adult and pediatric prophylaxis following exposure to human immunodeficiency virus and hepatitis B and C viruses

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The aim of this review facilitate the appropriate use of prophylaxis after occupational or nonoccupational exposure to the human immunodeficiency virus (HIV) or hepatitis B or C viruses (HBV and HCV). The recommendations are the result of consensus among expert panelists brought together by the office of the Spanish national secretariat for AIDS (SPNS) and a group of scientific societies. The panel reviewed the most important current epidemiologic and clinical studies in the literature or presented at scientific conferences and seminars. The risk of HBV, HCV, and HIV transmission after occupational exposure depends on the type of exposure, the serological status of the worker, the virologic status of the source, and the time elapsed after the accident. Prophylaxis following exposure is always recommended in cases of high or very high risk, and it is offered as an option in other cases. Ideally, prophylaxis should be initiated within 6 hours of exposure and certainly within 72 hours. Three antiretroviral drugs are generally prescribed except in situations of very low risk, when the use of 2 drugs might be acceptable. Treatment should be continued for at least 24 weeks. In nonoccupational exposure, the level of risk should be assessed thoroughly and the appropriate prophylactic measure taken. Prophylaxis should always be recommended after high-risk exposures and should be considered whenever there is appreciable risk. Once it has been determined that the exposure was exceptional, the physician and patient should come to an agreement regarding prophylaxis. The antiretroviral treatment protocols are the same after occupational and nonoccupational exposures. It is very important for health care facilities that dispense antiretroviral drugs to have risk assessment tools and action protocols at their disposal. [Emergencias 2009;21:42-52]

Key words: Postexposure prophylaxis. Occupational exposure. Nonoccupational exposure. Human immunodeficiency virus (HIV).

On many occasions, Emergency Department (ED) services are the first to receive people consulting for possible risk of infection by different pathological agents, especially human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV). In addition, in some of these centers and/or at certain times (especially out of normal hours for consulting hospital specialist departments), treatment can and should be initiated in the ED itself. It is therefore essential that ED staff know what actions to take in the event of exposure to such risk and that they adapt their respective hospital circuits to be able to correctly perform the necessary tests and actions.

This text is a summary of the Consensus Document dealing with recommendations on prophylaxis after occupational and non-occupational ex-

posure to HIV, HCV and HBV, whose primary objective is to facilitate the correct use of postexposure prophylaxis (available at www.msc.es and www.gesida.seimc.org). The recommendations, elaborated by members of the Secretaría del Plan Nacional sobre el Sida (SPNS) and diverse scientific societies (see authors), include evaluation of postexposure risk of transmission, indications for initiating prophylaxis and drug doses, as well as follow-up of exposed persons and special situations. For the elaboration of the document, an update of existing scientific evidence^{1,2} and was performed using the following levels of evidence according to the studies analyzed: Level A for randomized and comparative studies, Level B for cohort or case-control studies, and Level C for descriptive studies or expert opinion.

Occupational exposure (OE) was defined as the act of exposing a health worker in the exercise of professional duties to contact with blood, tissues or fluids potentially contaminated by HIV, HBV or HCV, via percutaneous lesion, mucosa or skin. Non-occupational exposure (NOE) was defined as the act of exposing a person to contact with blood, tissues or fluids potentially contaminated by HIV, HBV or HCV, via percutaneous lesion, mucosa or skin, in non-work-related or perinatal situations.

Action for HIV exposure

As a general rule, regardless of whether the exposure be occupational or not, prevention by avoiding exposure is necessary. To prevent OE to HIV, the following measures should be developed in all health institutions: instruction and training of personnel in universal precautions, availability and use of barrier material, special containers for potentially contaminated material, guaranteed advice and attendance 24 hours a day, availability of blood test diagnosis within 2 hours, access to timely medication when necessary, establishment of protocols for follow-up, availability and access to medical professionals responsible for attention and follow-up, and establishment of centralized notification criteria. To help prevent NOE to HIV, group or individual health instruction should be performed, including how to avoid or reduce risk of exposure. Local preventive measures, valid for both types of exposure, to be applied immediately, are presented in table 1.

Guidelines on treatment include the choice of antiretroviral drugs (ARV), doses and duration of the treatment. Existing guidelines take into consideration the risk of types of exposure, knowledge and experience in antiretroviral therapy, and data available on their toxicity^{1,3-6}. Recommendations on choice of ARV in post-exposure prophylaxis (PEP) have followed the instructions for use of these drugs and are based on expert opinion (Level C). Guidelines on possible choice and alternatives are presented in table 2. As a general rule, whenever possible, a physician with experience in ARV therapy will evaluate each case and select the therapy. This will be compulsory for cases of moderate or high risk. In general, in the event of suspicion or confirmation of ARV resistance in the source patient, a PEP will be selected that is equal to that which would be used to treat a patient without resistance. In pregnant women,

Table 1. Recommendations on Immediate Action in occupational exposure to HIV /HBV/HCV

Percutaneous exposure*	Bleeding and wash with soap and water
Cutaneous contamination*	Wash with soap and water
Mucosal contamination*	Wash with water
Eyes	Irrigate with clean water, saline solution, sterile water or 10% povidone iodine eye drops
Topical products such as chlorhexadine gluconate and/or povidone iodine may be used for their possible antiviral effects against HBV/HCV. Caustic agents (bleach, skin disinfectants) or aggressive manoeuvres are not recommended.	

*These recommendations are equally valid for non-occupational exposure.

such choice of therapy must take into consideration the possible adverse effects and specific risks associated with certain ARV drugs not recommended for use in these cases. The greatest experience of ARV drug use in pregnancy has been with zidovudine, lamivudine, nelfinavir and lopinavir-ritonavir.

Occupational transmission of HIV/HBV/HCV

The risk of transmission of HIV/HBV/HCV exists, but there are differences between them. HCV is not readily transmitted by exposure to blood, rarely by mucosal exposure to blood, and there are no reports of cases due to contact with broken skin. The mean incidence of seroconversion after percutaneous exposure to a positive source of HCV is 1.8% (0-7%)⁷⁻¹⁰. In OE to HBV, the risk depends on the intensity and type of contact with blood. He estimated mean risk of HIV transmission after percutaneous exposure is 0.3% (0.2-0.5% IC: 95%) and after mucosal exposure it is 0.09% (0.006-0.5%; IC: 95%). Transmission via broken skin and other fluids or tissues has not been quantified adequately or at all.

1. Evaluation of transmission risk

The risk of HIV transmission depends on type of exposure and time elapsed, virologic status of the source and serologic status of the worker. There is a direct relation between magnitude of the accident (volume of blood and viral load) and the possibility of seroconversion. The existence of low or undetectable viral loads does not exclude the risk of infection, since plasma viral load quantifies "extracellular" viral particles in peripheral blood, but does not evaluate the existence of infected cells with infective capacity.

Factors related to the accident refer to depth

Table 2. Recommendations on Immediate Action in occupational exposure to HIV /HBV/HCV

	A	B	C
Choice of therapy	– Zidovudina (AZT) [†] 250-300 mg/12 hours – Tenofovir [‡] 245 mg/24 hours	– Lamivudina (3TC) [†] 300 mg/24 hours – Emtricitabina [‡] (FTC) 200 mg/24 hours	– Lopinavir-ritonavir (coformulados) 400/100 mg/12 hours – Fosamprenavir 700 mg/12 hours + ritonavir 100 mg/12 hours – Saquinavir 1.000 mg/12 hours + ritonavir 100 mg/12 hours – Atazanavir 300 mg/24 hours + ritonavir 100 mg/24 hours – Efavirenz 600 mg/24 hours
Alternative therapies	– Didanosina (ddl) 250-400 mg/24 hours – Estavudina (d4T) 30 mg/12 hours		

*The therapy recommended initially in the majority of cases of exposure requiring PEP is a combination of 3 drugs. [†]AZT and 3TC commercially available co-formulated (300 mg AZT and 150 mg 3TC). [‡]Tenofovir and Emtricitabine commercially available co-formulated (245 mg tenofovir and 200 mg emtricitabine).

of puncture, type of material used, barrier factors present, intact skin and mucosa, and type of fluid to which the worker was exposed, with visible blood representing the greatest risk.

With respect to serologic status of the source, if this is known, a complete blood test will be performed after informed consent, in the shortest possible time, including the option of rapid test results within 2 hours. If the source serologic status is unknown, action will be taken as if HIV infection has taken place. If the source is known to be HIV positive, his/her immunovirologic status will be determined (viral load, CD4 count, complete history of ART and medication). It is worth recalling that the greatest risk of transmission occurs when the source is a patient in seroconversion or in advanced stage of the disease. Regarding the exposed worker, it is fundamental to determine his/her serologic status, performing all tests necessary after the exposure.

The general recommendations for Prophylaxis after Occupational Exposure (POE) against HIV are presented in table 3.

The risk of HBV/HCV transmission also depends on type of exposure, source patient and exposed person, and the same evaluation will be performed regarding form and type of exposure.

If the serologic status of the source is unknown, the tests will be performed after informed consent in the shortest possible time, and action will be taken assuming infection. In the evaluation of the exposed worker, he/she will be considered susceptible to HBV infection when HbsAg and anti HbC are negative and antiHbs < 10 mUI/ml. If the HBV vaccination regimen is correct, only follow-up is required, consisting of initial blood tests and at 6 months. Regarding HCV, there are currently no effective measures for postexposure application.

The document on informed consent, available

Table 3. General Recommendations for occupational exposure prophylaxis (POE) against HIV

Type of exposure	Type of material	Recommend prophylaxis
Percutaneous	Blood*	
	• Very high risk	Recommend
	• High risk	Recommend
	• Low risk	Offer
Mucosa	Liquid containing blood, other infectious liquids and/or tissues	Offer
	Other body fluids	No recommend
	Blood	Offer
	Liquid containing blood, infectious liquids and/or tissues	Offer
High risk skin [‡]	Other body fluids	No recommend
	Blood	Offer
	Liquid containing blood, other infectious liquids and/or tissues	Offer
	Other body fluids	No recommend

**Very high risk is defined as an accident with large volume of blood (deep puncture with needle used in patient vascular access) and with high HIV viral load (seroconversion or advanced stage of the disease). High risk is defined as an accident with a large volume of blood or with blood containing high HIV viral load. Low risk: is an accident without a large volume of blood or without blood containing high HIV viral load (puncture with suture needle used on a patient without symptoms of HIV infection, with low or undetectable viral load).

[†]Includes semen, vaginal secretion, cephalorquid, sinovial, pleural, peritoneal, pericardial and amniotic liquids. [‡]Cutaneous contact of high risk refers to liquid s with high HIV viral load, very prolonged, extensive area or if there are areas of broken or compromised skin.

DECLARATION OF WORKER

My doctor has satisfactorily explained post-exposure prophylaxis treatment after HIV exposure, how and why it is performed. Also, I have been told about its possible risks, benefits and complications, and that there are no alternative therapies for the same ends. I am aware that there are no guarantees as to the end result. I completely understand the above and hereby **GIVE MY INFORMED CONSENT** to undergo the above-mentioned preventive treatment administered by the necessary medical professionals. I may withdraw this consent whenever I so decide.

Name: _____, ID: _____
Signature _____ Date _____

DECLARATION OF LEGAL GUARDIAN OR RELATIVE

I am aware that the worker (name)

- has delegated responsibility to me
- is not competent to decide for him/herself at this time
- freely wishes, before a witness, to share his/her decision with me, without prejudice to the confidentiality required by the case.

The doctor has satisfactorily explained post-exposure prophylaxis treatment after HIV exposure, how and why it is performed. Also, I have been told about its possible risks, benefits and complications, and that there are no alternative therapies for the same ends. I am aware that there are no guarantees as to the end result. I completely understand the above and hereby **GIVE MY INFORMED CONSENT** for (name) to undergo the above-mentioned preventive treatment administered by the necessary medical professionals.

I may withdraw this consent whenever I so decide.

Name: _____, ID: _____
Signature _____ Date _____

DECLARATION OF ATTENDING PHYSICIAN

I, Dr.

have informed the worker or the legal guardian/relative about the purpose and nature of the post-exposure prophylaxis after occupational exposure to HIV, as well as its possible benefits, risks, alternatives and the expected results.

Signature _____ Date _____

IF YOU ACKNOWLEDGE RECEIVING ADEQUATE INFORMATION AND AGREE TO UNDERGO POST-EXPOSURE PROPHYLAXIS AFTER OCCUPATIONAL EXPOSURE TO HIV BUT DO NOT AGREE TO SIGNING THIS CONSENT FORM, PLEASE INDICATE YOUR REASONS BELOW:

.....
.....

Name of witness _____, ID _____
Signature of witness _____ Date _____

IF YOU ACKNOWLEDGE RECEIVING ADEQUATE INFORMATION BUT DO NOT AGREE TO UNDERGO POST-EXPOSURE PROPHYLAXIS AFTER OCCUPATIONAL EXPOSURE TO HIV, PLEASE SIGN YOUR NEGATION AND INDICATE YOUR REASONS FOR THIS DECISION:

.....
.....

Name of worker/guardian/relative _____, ID _____
Signature _____ Date _____

Figure 1. Declarations and signatures.

in complete form at www.msc.es includes information on exposure to the risk of occupational transmission of HIV, the possible benefits of PEP and indications, treatment regimens, initiation and duration of PEP, the risks and effects of ARVs and the general and specific recommendations for each case. The form containing declarations and signatures is depicted in Figure 1.

Recommendations

– The risk of infection after exposure depends on the characteristics of the source patient, type of exposure and serologic status of the exposed person (Level B).

– Maximim risk occurs when exposure consists of deep puncture with a hollow needle contaminated with previous vascular access (artery or

vein) from a HIV infected patient in very advanced stages of the disease (Level C).

- The HIV status of the exposed person and the source patient must be determined (Level C).

- Evaluation must be performed as soon as possible (within 2 hours after exposure) (Level C).

- Advice and attendance must be guaranteed within 24 hours, with blood test diagnosis within 2 hours and access to medication when necessary within the established time limits (Level C).

2. Prophylaxis after Occupational Exposure (POE) to HIV

The general recommendations presented in table 3 will be followed. Prophylaxis must be initiated as soon as possible, ideally within 6 hours of the incident and compulsorily before 72 hours. Recommended duration is 28 days. Psychological support and symptom control must be offered. The situation may generate anxiety states and stress; management will be by a clinical professional who will provide all the information necessary, in detail, including secondary effects, relevant strategies and evaluation of the emotional state, with recourse to professional mental health specialists when required. Figure 2 shows the circuit of action in the event of OE to biological material.

The conditions to be met for considering the use of POE are as follows:

- a) Source patient with infection by HIV or unknown infection with risk factors: intravenous drug user (IVDU) or belonging to a social group with high prevalence of HIV. Prophylaxis will be interrupted if blood tests are negative.

- b) There is percutaneous exposure (puncture, cut), mucosa, or cutaneous exposure with compromised skin (dermatitis, abrasions, wounds).

- c) Time lapse after exposure is less than 72 hours.

The decision to use POE depends on the type of Exposure, clinical and virologic state of the source patient, and meets the above-mentioned conditions.

- As the norm, treatment with 3 drugs (2 AN + 1 PI) is recommended, except in very low risk exposure when 2 drugs (2 NA) (Level C) may be used.

- Regardless of the clinical and virologic state of the source patient, treatment with the 3 drugs is mandatory for all cases of high risk exposure (Level C).

- In intermediate risk exposure to a HIV source with undetectable viral load (> 50 copies/ml) or

not controlled (symptomatic or with primoinfection), treatment with 3 drugs (2 NA + 1 PI) is recommended. In this type of exposure with controlled HIV source patient (viral load < 50 copies/ml, asymptomatic), prophylaxis with 2 drugs is acceptable. (Level C).

- If the serology of the source patient is unknown or pending, indication for PEP must be individualized. When there is a reasonable probability and the risk of exposure is not low, it is better to initiate PEP and then re-evaluate the situation (Level C).

Follow-up will be maintained during a minimum of 24 weeks. Certain authors recommend 12 months follow-up for possible late seroconversion.

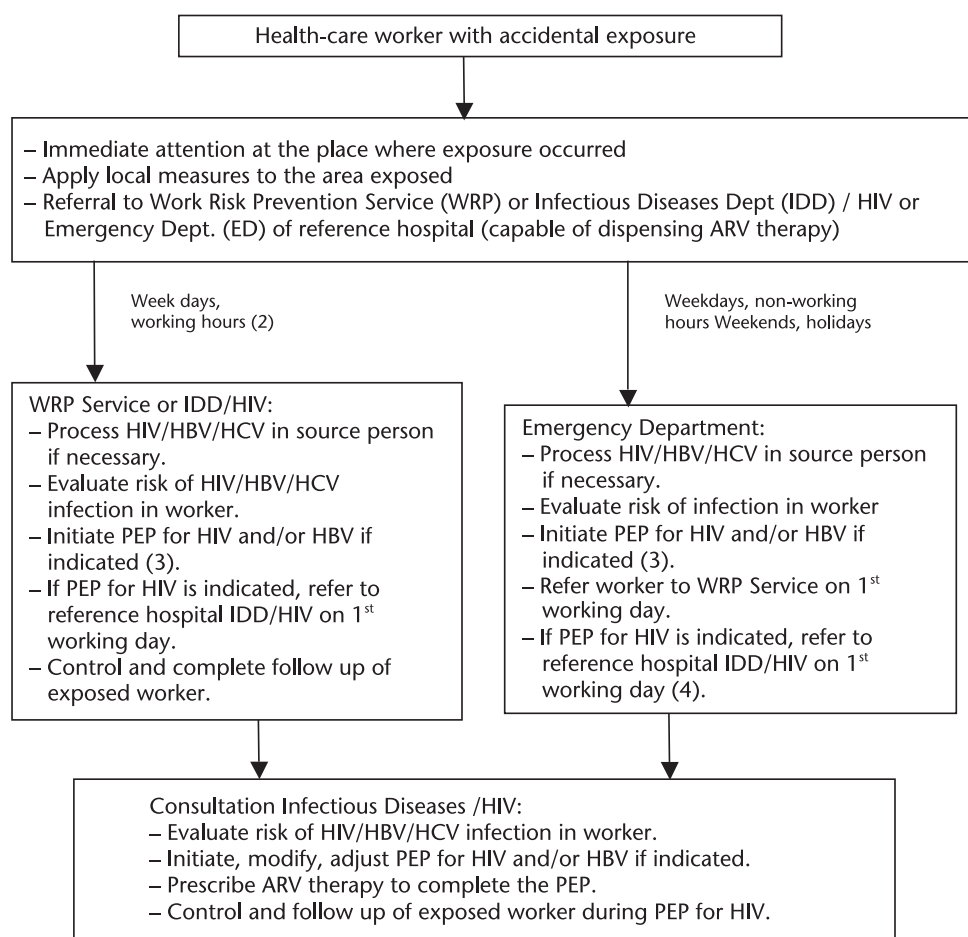
3. Prophylaxis after Occupational Exposure (POE) against HBV and HCV

If the source of exposure is positive for the surface antigen of HBV (AgHBVs), or this is unknown but the risk of being positive is high, and the exposed person presents incomplete or no vaccination, he/she will receive 1 dose of antiHBV immunoglobulin (0.06 ml/Kg BMI) and the first dose of the vaccination, with completion of the full vaccination program performed later. In exposed persons with complete vaccination, antibodies against surface antigen HBV (HBsAg) will be determined. If this is ≥ 10 mIU/ml, prophylaxis is unnecessary. If it is lower, action will depend on response to the vaccine: if good, a reinforcing dose of vaccine will be administered, and if unknown 1 dose of antiHBV immunoglobulin will be administered and the full vaccination program completed. If there is no response after 2 complete vaccination series, 2 doses of immunoglobulin at 30-day intervals will be required. If the source of exposure is negative for AgHBVs or unknown, exposed persons with incomplete or no vaccination must receive the first

Table 4. Risk of HIV transmission after exposure to an infected source

Type of exposure	Estimated risk of HIV transmission (%)
Blood Transfusion (one unit)	90 - 100
Anal reception	0.1 - 3.0
Vaginal reception	0.1 - 0.2
Vaginal penetration	0.03 - 0.09
Anal penetration	0.06
Receptive oral-genital sex	0 - 0.04
Percutaneous puncture with needle	0.3 (0.2 - 0.5 IC 95%)
Sharing injection material	0.67
Mucosal exposure	0.09 (0.006 - 0.5 IC 95%)

Modification by Fisher. Int J STD&AIDS 2006 (UK Guideline).



- (1): This circuit will be adapted according to the characteristics of each hospital.
 (2): Referral to WRP Service or IID/HIV according to the characteristics of each hospital.
 (3): Easy 24h/day access to the Hospital Pharmacy is necessary for ARV drugs and/or a small stock should be available in Emergency Dept. The exposed worker should be supplied with the necessary doses until consultation with Infectious Diseases /HIV Dept.
 (4): If the incident occurs during working hours, the affected person should be referred the same day for IDD/HIV specialist consultation.

Figure 2. Chain of action in the event of accidental occupational exposure to biological material (1).

ARV: antiretroviral; PEP: postexposure prophylaxis.

dose of the vaccine and complete the vaccination later. Vaccinated persons and those with levels of AchBVs below 10mUI/ml must receive a reinforcing dose and their AchBV levels re-evaluated in 1-2 months.

For HCV, unfortunately, there is currently no type of prophylaxis to offer.

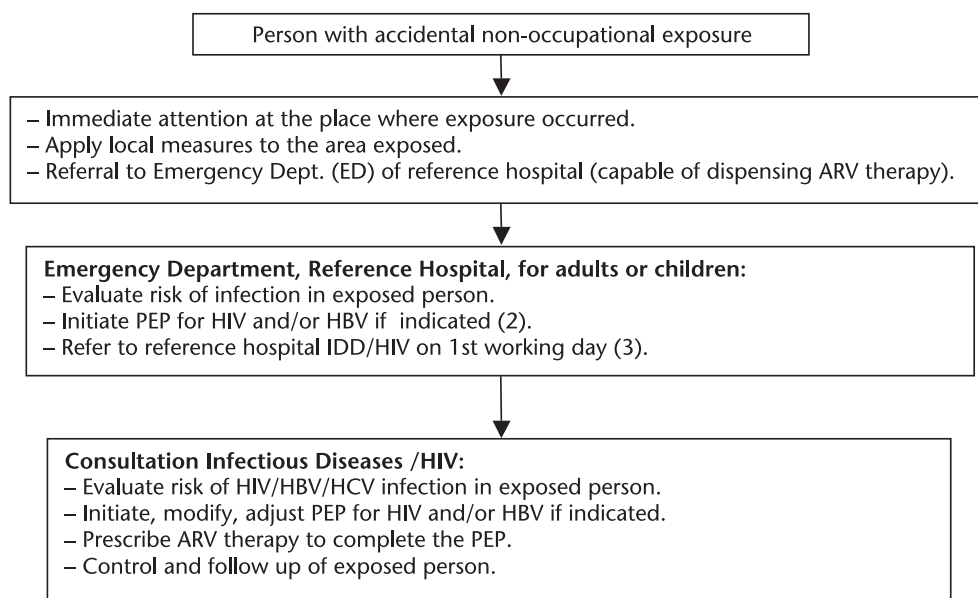
Non-ocupacional Transmission of HIV/HBV/HCV

Calculation of the risk of transmission depends on prevalence of HIV in the population of the source person and the estimated risk of exposure. The risk of HIV transmission is presented in table 4.

Figure 3 presents the algorythm of action in accidental NOE to biological material.

1. Evaluating risk in non-occupational exposure

The probability of HIV transmission depends on type of exposure, virologic status of the source patient and additional factors^{1,12,13} such as: sexual aggression (rape), source infectivity, presence of other sexually tansmitted infections (STI) or genital wounds/lesions and bleeding or menstruation. The type of exposure includes sex (with consent), rape, blood or hemoderivative transfusion, accidents with needles or cutting objects, contact with infected fluid or tissue, bites and perinatal transmission or breast-feeding. In practice, non-



(1): This circuit will be adapted according to the characteristics of each hospital.

(2): Easy 24h/day access to the Hospital Pharmacy is necessary for ARV drugs and/or a small stock should be available in Emergency Dept. The exposed person should be supplied with the necessary doses until the appointment with Infectious Diseases /HIV Dept.

(3): If the person is attended in Emergency Dept. during working hours, they should be referred to the Dept. of Infectious Diseases /HIV the same day.

Figure 3. Chain of action in the event of accidental exposure to biological material (1).

ARV: antiretroviral; PEP: postexposure prophylaxis.

occupational transmission of HIV is almost always sexual or parenteral. Evaluation according to the activity inducing the risk allows differentiating between the two types of exposure.

Evaluation of the risk of sexual HIV infection^{1,12,13}, known or unknown in the source person is presented in table 5. Risk due to parenteral pathway⁵⁻⁷ assumes the possibility of HIV infection of the source person, given the high prevalence

of HIV among IVDU in Spain. Levels of risk are presented in table 6.

The risk of HBV/HCV transmission and other infections should also be evaluated, since HIV shares transmission pathways with HBV/HCV. Thus in all cases, serologic status should be determined, and vaccination or antiHBV gammaglobulin should be used depending on the case. For sexual exposure, other STI^{1,12,13} should be ruled out and

Table 5. Evaluating the risk of sexual infection

Source person HIV infected		
Considerable risk (0.8-3%)	Low risk (0.05-0.8%)	Minimal risk (0.01-0.05%)
Anal reception with ejaculation*	Vaginal reception with ejaculation* Anal reception without ejaculation* Vaginal reception without ejaculation* Anal Penetration* Vaginal penetration* Orogenital sex with ejaculation*	Oral sex without ejaculation* Female orogenital sex
Source person with HIV infection unknown		
Low risk (0.05-0.08%)	Minimal risk (0.01-0.05%)	Negligible or no risk (< 0.01%)
Anal reception with ejaculation*	Anal reception without ejaculation* Vaginal reception without ejaculation* Anal penetration* Vaginal penetration* Oral sex with or without ejaculation* Female orogenital sex	Kissing Fondling Masturbation Integral skin contact with secretions

*With inadequate, torn or no condom use.

Table 6. Evaluating the risk of HIV infection by parenteral pathways

Considerable risk (0.8-3%)	Low risk (0.05-0.8%)	Minimal risk (0.01-0.05%)
- Sharing syringes or used needles - Deep Puncture or with abundant bleeding with syringe immediately after use by unknown source person	- Use of a syringe of unknown origin - Superficial puncture after use by the source person - Contact with abundant blood from the source person with mucosa of the affected person	- Sharing the rest of the injection material. - Accidental puncture with little blood with the needle of a syringe of unknown source

single-dose antibiotic prophylaxis used against Chlamydia, syphilis, gonococcus and *Trichomonas vaginalis*.

2. Prophylaxis after non-occupational exposure (PNOE) to HIV

After evaluating the risk of transmission, the exceptional nature of the exposure must be established since PEP will not be carried out in cases of repeated exposure. In NOE, insistence on primary preventive measures is necessary (avoidance of risk practices, correct use of barrier methods, non-sharing of injection material). All possible information on the source will be recorded and blood test follow-up of the exposed person performed. In addition, tests for other STI will be performed and appropriate measures will be adopted, including HBV and/or anti-tetanus immunization when necessary.

The NOE conditions for considering the implementation of PEP are:

a) The source person, known or unknown to be HIV positive, has risk factors: IVDU or belongs to a social group with high prevalence of HIV (PEP will be interrupted if serology is negative).

b) In exposure with high risk (unprotected receptive anal sex with ejaculation, sharing of needles or syringes immediately after use), PEP is necessary. In exposure with considerable risk (unprotected receptive vaginal sex, unprotected receptive anal sex without ejaculation, unprotected vaginal or anal insertion, unprotected receptive orogenital insertion with ejaculation), PEP should be considered, especially if the source person has "uncontrolled" infection".

c) The time lapse after exposure is less than 72 hours.

The general recommendations for implementing PNOE are:

- Must form part of an integral medical intervention including individualized sanitary instruction by a physician and clinical follow-up of the exposed person.
- The decision to implement PNOE will be in-

dividualized and by consensus between the physician and the exposed person.

- PNOE is only indicated in cases of sporadic, isolated or unusual exposure.

- PNOE must be initiated as soon as possible, ideally within 6 hours after exposure, since the possibility of success decreases over time¹⁴.

- Cases not meeting the conditions for PNOE will be instructed on measures to avoid further exposure and will be offered clinical follow-up.

- Before initiating prophylaxis, the following tests will be performed (without these causing treatment delay): serology (ELISA), viral load, complete hemogram and general biochemistry, HBV and HCV serology, diagnostic tests for other STI, as well as pregnancy tests for all women with sexual exposure.

- Before initiating prophylaxis, the exposed person will receive all the information necessary and then sign the informed consent form (chain of action against accidental occupational exposure to biological material).

- In all cases, information will be given on the clinical picture of HIV primoinfection (acute retroviral syndrome) and indications if symptoms appear.

The decision to implement PNOE depends on the type of exposure, clinical and virologic status of the source person, who must meet the above-mentioned conditions. PNOE is only recommended after considerable risk of HIV exposure (unprotected receptive anal sex with ejaculation (0.5-3%) or syringe sharing with the infected person (0.67%)), but also considered when the source person has uncontrolled HIV infection (Level C). Antiretroviral therapy will be the same as that used for occupational exposure.

In general, when PNOE is indicated, treatment with 3 drugs will be administered (Level C).

Recommendations on antiretroviral therapy

PEP is recommended when the source person is known to HIV infected and there is considerable risk of transmission. It should be initiated in the first 6 hours after exposure and not later than 72 hours, and the exposed person can and

Table 7. Risk of HIV infection according to source person infection status

Source person HIV infection status	Risk of HIV transmission
No HIV infection	No risk
HIV status unknown or source unknown	Risk not quantified
HIV status unknown, but known source without risk factors for HIV infection	Low risk
HIV status unknown, but known source with risk factors for HIV infection	Intermediate risk
Known HIV Infection	High risk

is willing to undergo follow-up (Level B). However, it may be considered after 72 hours in certain cases presenting high risk of transmission. When possible, complete information on the source person's ART history and most recent viral load values will be obtained. After his/her consent and rapid availability of the test results, new viral load values should be obtained and finally genotype resistance determined. If the risk of transmission is low and the source person's HIV status unknown and rapid HIV blood tests are not possible, the decision to implement PEP will be taken by consensus between the physician and the exposed person, after weighing up the potential risks and benefits in each particular case (Level C).

If the HIV status of the source person is unknown, but he/she is an IVUDU or belongs to a social group with a prevalence of at least 10%, action will be the same as that required for HIV infection (Level C). Regardless of the source person's HIV status, and the previous considerations, PEP is not recommended when the risk of transmission is minimal or non-existent (Level C).

The psychological aspects will be evaluated and acted on when deemed necessary. For follow-

up, after the first 2 weeks of prophylaxis, hemogram and plasma biochemistry will be performed, and independently of when PEP was initiated, controls will be performed at 4-6 weeks, 3 months and 6 months.

3. Prophylaxis after non-occupational exposure (PNOE) to HBV and HCV

If the source person presents positive AgHBVs test and the risk of exposure is classified as intermediate or higher, the exposed person with complete vaccination will receive a reinforcing dose

of the vaccine. In those who are non- or incompletely vaccinated, a dose of immunoglobulin will be administered and they will receive the first vaccination dose, to be completed later. If the source person's AgHBVs is unknown and contact is of intermediate risk or higher, those exposed with complete vaccination do not require prophylaxis, while those who are non- or incompletely vaccinated will be vaccinated over time (the first dose being administered in emergency department) until completion.

For HCV, unfortunately, there is currently no type of prophylaxis to offer.

Table 8. Types of exposure

	Magnitude of risk
Cutaneous exposure	
Fluids on intact skin	Risk not identified
Bite without broken skin	Risk not identified
Fluids on compromised skin (eczema, dermatitis, abrasion, laceration, open wound)	Low-intermediate risk
Cutaneous Wound with bleeding of the source and the exposed person	High risk
Percutaneous exposure	
Superficial scratch from sharp object including needles found in public places	Risk not identified
Piercing wound with non-hollow needle	Low risk
Piercing wound with hollow needle without visible blood	Low risk
Piercing	Low risk
Bite with broken skin	Low risk
Piercing wound with hollow needle with visible blood	Intermediate risk
Piercing wound with long hollow needle with visible blood visible or recently used needle	High risk
Mucosal exposure	
Kissing	Risk not identified
Oral sex	Low risk
Single intake of infected maternal milk	Low risk
Fluids in the eyes or mouth	Low risk
Vaginal reception without trauma	Intermediate risk
Anal reception	High risk
Vaginal or anal reception with trauma (sexual abuse)	High risk

4. Special situations

In cases of pregnancy, the most recent recommendations and updates will be applied. In cases of sexual aggression with greater risk of infection, the recommendation is PEP and a medico-legal procedure. Finally, in cases of children and adolescents, the following situations of exposure are described: accidental puncture with IVDU HIV infected needles (the most frequent), home accidents with sharp cutting objects used by a HIV infected, sexual abuse which, although infrequent, entails greater risk of viral transmission in children¹⁵, consenting sexual contact, and other childhood accidents.

The risk of HIV transmission varies according to the type of exposure, type of fluid or material and the HIV status of the source person (Tables 7 and 8). The natural place for attending these cases of minors is a hospital ED, which must be prepared with pediatric formulations of the required medication in sufficient quantities to ensure 3 days of treatment, and simultaneously refer the patient for specialist consultation, marked urgent in all cases.

a) Local measures:

- Wash the cutaneous or mucosal wound or abrasion with soap and water.
- Surgical attention quirúrgica in cases of anal or vaginal tear or wounds requiring stitches.

b) Data collection: with questions oriented to establish identification of the source person, and vaccination status of the exposed child or adolescent, and

- when and how the exposure occurred.
- if the source person is known to be HIV infected. If so: Are they receiving ART? If so, information on present and past medication should be obtained, as well as viral load if known.
- if the HIV status of the source person is not known, what are their risk factors?
- Vaccination status of the child/adolescent. Correctly vaccinated against tetanus and HBV?

c) Measures aimed at reducing the risk of co-infection by other agents:

- Anti-tetanus gammaglobulin test and/or vaccination reinforcement.
- Anti-hepatitis B gammaglobulin test.
- Evaluate the need for antibiotics to prevent local or sexually transmitted infection.
- There are currently no data on the use of interferon to prevent hepatitis C.

PEP is not 100% effective and there are reports of failure^{16,17}, which possibility must be explained to the exposed person/tutor together with ins-

tructions on how to recognise acute retroviral syndrome. Also necessary for adolescents is instruction on preventive measures to avoid unprotected sexual relations. It is recommended to initiate treatment with High Activity Antiretroviral therapy (HAART) as soon as possible, ideally within 6 hours and lasting for a period of 28 days.

Recommendations for children and adolescents

Triple ART including 2 nucleoside analogs and 1 protease inhibitor. The combination recommended is Lopinavir/ritonavir + Lamivudine + Zidovudine (Level C) given the existence of pediatric formulations, experience of use, and general availability in the majority of centers. In some circumstances this regimen may require modification due to adverse effects, rejection of triple therapy by the patient or tutor, or with the intention of ensuring otherwise doubtful adherence; then dual therapy with 2 nucleoside analogs should be considered, preferably lamivudine and zidovudine (Level C).

Although severe adverse effects are infrequent¹⁸⁻²⁰, toxicity may present in up to 76%¹⁸ of cases (and higher with triple therapy)²¹, which may well lead to reduced adherence.

Addendum

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Recomendaciones sobre profilaxis postexposición frente al VIH, VHB y VHC en adultos y niños

Panel de expertos de SPNS, GESIDA, CEEISCAT, SEIP y AEP

El objetivo es facilitar el uso apropiado de la profilaxis postexposición ocupacional y no ocupacional a VIH, VHB y VHC. Las recomendaciones han sido elaboradas y consensuadas por un panel de expertos de la Secretaría del Plan Nacional sobre el Sida (SPNS) y de Sociedades Científicas. Para ello se han revisado los estudios epidemiológicos y clínicos más actuales y relevantes publicados y/o presentados en congresos y reuniones científicas. El riesgo de transmisión de VHB, VHC y VIH tras exposición ocupacional depende del tipo de exposición, situación serológica del trabajador, estado virológico de la persona fuente y tiempo tras el accidente. Se recomendará siempre la profilaxis postexposición en aquellos casos de riesgo alto o muy alto y se ofrecerá en el resto. Idealmente se iniciará la profilaxis en las 6 primeras horas y obligatoriamente antes de 72 horas tras la exposición. La profilaxis se realizará con 3 fármacos antirretrovirales como norma general, con la salvedad de las situaciones de riesgo muy bajo en la que podría ser aceptable usar 2 fármacos. El seguimiento se mantendrá durante 24 semanas. En la exposición no ocupacional, se clasificará correctamente el nivel de riesgo tras la exposición y se actuará en consecuencia. La profilaxis se recomendará siempre tras exposiciones con riesgo alto, se considerará con riesgo apreciable. Será objeto de consenso entre médico y paciente y siempre que se confirme la excepcionalidad de la exposición. Las pautas antirretrovirales son las mismas que para exposiciones ocupacionales. Es muy importante disponer de instrumentos para la clasificación del riesgo y de protocolos de actuación en las instituciones sanitarias con capacidad para dispensar fármacos antirretrovirales. [Emergencias 2009;21:42-52]

Palabras clave: Profilaxis postexposición. Exposición ocupacional. Exposición no ocupacional. VIH.