HIV PEP – Occupational exposure recommendations – Evidence to decision

Recommendations are numbered 1-5 based on the sequence in which they appear in section 4.1 of the EMI guidelines.

Recommendation 1

Recommended	GRADE: 1C[1]
Please see the needlestick exposures and mucosal splash exposures algorithms. Human Immunodeficiency Virus (HIV) Post Exposure Prophylaxis (PEP) is **recommended** following a **high-risk occupational exposure** (sharps or mucosal splash) if the index case is known to be living with HIV and is not on antiretroviral therapy (ART) for at least 6 months, with a suppressed viral load within the last 6 months. Please see also table 6 *HIV PEP recommendations by type of exposure and source status*. [1, 12, 14-19].	

[1] Strong recommendation, low certainty evidence

Evidence to decision

Benefits and harms
The benefit of prescribing HIV PEP following a high-risk occupational exposure outweighs the harms associated with the potential toxicity and inconvenience of HIV PEP. Effective treatment confers significant individual benefit and reduces the risk of onward transmission.

Certainty of the Evidence	Low
The risk of HIV transmission from a percutaneous exposure (sharps injury) from an index case living with HIV not on suppressive ART is estimated to be 0.3% (1 in 333) [12], [14]. The risk is increased with higher viral inoculum, which is related to the amount of blood introduced and the concentration of virus in that blood. The size of the needle, the depth of penetration and whether blood was injected are also important considerations. In most reported instances involving transmission of HIV, the needlestick exposure occurred within seconds or minutes after the needle was withdrawn from the source patient [15]. In a study of occupationally associated needlestick exposures, seroconversion was associated with factors including whether the needle or device was visibly contaminated with blood, the exposure was deep, or if the exposure was sustained by a large gauge hollow bore needle [12]. Post-exposure prophylaxis (PEP) is thought to reduce seroconversion by up to 81% (95% CI 48-94%) [12]. The results of the pooled analysis identified the below factors with an increased odds of HIV seroconversion [12], [14]: 1. Deep injury (OR 15, 95%CI, 6.0-41). 2. A device visibly contaminated with a patient's blood (OR 6.2, 95% CI 2.2-21).	

3. Needle placement in a vein or artery (0R 4.3, 95% CI 1.7-12).
4. Terminal clinical AIDS in the index case (OR 5.6, 95% CI 2.0-16) (this is likely to indicate a high viral load in the index case).

Commencing PEP as soon as possible after the exposure provides the greatest benefit. In animal studies, administration of PEP within 36 hours prevented seroconversion. In animals who received PEP at 72 hours after exposure, 25% seroconverted. In contrast, 75% of the animals who did not receive any PEP seroconverted by 4 weeks post exposure [16]. Additionally, treatment is most effective when continued for 28 days. There are documented case reports of Health and care workers who have become infected with HIV following occupational exposure, despite use of PEP, which in one case was commenced within 30 minutes [17].

The risk of transmission associated with splash exposures is less than the risk associated with needlestick exposures, and HIV seroconversion following splashes of blood to intact skin has not been reported [18]. The risk of HIV transmission associated with exposure of non-intact skin and mucous membrane exposure to HIV infected fluid is possible [17] but the risk is very low [18]. The risk of HIV acquisition from a mucocutaneous 'splash' exposure is estimated to being around 0.1% (1 in 1000 exposures) if the index case living with HIV is not on ART which is considerably lower than a percutaneous 'sharps' injury [1]. For splash exposures, a systematic review and meta-analysis [19] reported 8 cases of HIV transmission attributable to splash exposures however almost always from a blood splash exposure rather than other bodily fluids.

For further information, please see Table 8 *Risk of HIV transmission per exposure where source is known to be living with HIV* and not on ART and Table 9 *Estimated risk of HIV transmission by type of exposure where source HIV status is unknown.*

Values and preferences

There are certain factors that increase the risk of HIV transmission following a high-risk occupational exposure. Where a decision is made by a health professional to prescribe HIV PEP, it is likely that most patients in this situation would want the recommended course of action and only a small proportion would not.

Recommendation 2

NOT recommended	GRADE: 2C[2]

HIV PEP is **NOT recommended** following a **sharps exposure** if the index case is known to be living with HIV AND has been on ART for at least 6 months with an undetectable HIV viral load (at the time of last measurement and within the previous 6 months) AND reported good adherence, table 6 *HIV PEP recommendations by type of exposure and source status*. However due to a lack of direct evidence, a case by case decision can be made depending on the nature of the exposure [1].

[2] Weak recommendation against, low certainty evidence

Evidence to decision

Benefits and harms

The risk of HIV transmission is negligible and HIV PEP should not be given because the potential toxicity and inconvenience of PEP is likely to outweigh the benefit. Although it is highly likely that viral suppression eliminates the risk of HIV transmission through sharps injuries, the lack of evidence to support this should be discussed, and a case-by-case decision can be made in the context of high-risk sharps injuries.

Certainty of the Evidence	Low

The extensive data informing elimination of transmission risk with suppressive ART only applies to sexual exposures [1]. In the context of sharps exposures, the transmission risk when the index is on suppressive ART is likely to be negligible. Although it is highly likely that viral suppression eliminates the risk of HIV transmission through sharps exposure, the lack of evidence to support this should be discussed, and a case-by-case decision can be made in the context of high-risk sharps exposures [1]. Where there are concerns about the viral load of the index case being detectable, or concerns around ART adherence or if the exposure is particularly high risk (e.g. deep wound with hollow bore needle) then PEP could be considered.

For further information, please see Table 8 *Risk of HIV transmission per exposure where source is known to be living with HIV and not on ART* and Table 9 *Estimated risk of HIV transmission by type of exposure where source HIV status is unknown.*

Values and preferences

Where a decision is made by a health professional to not prescribe HIV PEP, most people in this situation would want the suggested course of action but many would not. The decision not to prescribe HIV PEP should be made on a case by case basis through discussion and shared decision making with their health professional. Healthcare providers should discuss the evidence with patients as well as consider their values and preferences.

Recommendation 3

NOT recommended	GRADE: 1C[3]
HIV PEP is **NOT recommended** following a **mucosal splash exposure** if the index case is known to be living with HIV AND has been on ART for at least 6 months with an undetectable plasma HIV viral load (at the time of last measurement and within the last 6 months) AND with good reported adherence. HIV PEP is **NOT recommended** where there is no or negligible risk of HIV transmission (e.g. through intact skin that comes into contact with HIV infected blood or other bodily fluids) [1].	

[3] Strong recommendation against, low certainty evidence

Evidence to decision

Benefits and harms
The risk of HIV transmission is negligible, and HIV PEP should not be given because the potential toxicity and inconvenience of HIV PEP is likely to outweigh the benefit. In the context of mucocutaneous splash exposure, the transmission risk when the index is on suppressive ART is likely to be negligible.

Certainty of the Evidence	Low
The risk of HIV transmission from a mucocutaneous splash (e.g, eye) is estimated to being around 0.1% (1 in 1000 exposures) if the index case living with HIV is not on ART. The extensive data informing elimination of transmission risk with suppressive ART only applies to sexual exposures. In the context of mucocutaneous splash injuries, the transmission risk when the index is on suppressive ART is likely to be negligible [1]. PEP is not recommended following any splash injury where the index case has been on ART for at least 6 months with an undetectable plasma HIV viral load (at the time of last measurement and within the last 6 months) with good reported adherence, but can be considered if there is a blood splash to a mucosal surface and the index case is not known to be undetectable. The risk of HIV transmission through non-intact skin (abrasions, cuts, sores) is considered to be negligible [1]. HIV cannot be transmitted through intact skin [1]. For further information, please see Table 8 *Risk of HIV transmission per exposure where source is known to be living with HIV and not on ART* and Table 9 *Estimated risk of HIV transmission by type of exposure where source HIV status is unknown.*	

Values and preferences
In the context of sharps and mucocutaneous splash injuries, the transmission risk when the index is on suppressive ART is likely to be negligible. Where the decision is made by a health professional not to prescribe HIV PEP, it is likely that this outcome will be of similar importance to the patient and only a small proportion of people would not want the recommended course of action.

Recommendation 4

Generally NOT recommended	GRADE: 1C[4]

Please see the needlestick exposures and mucosal splash exposures algorithms.

HIV PEP is **generally NOT recommended** following a **sharp or mucosal splash exposure** if the index case is untested AND considered part of a group with higher HIV prevalence than the general population (e.g. gay, bisexual, and other men who have sex with men (gbMSM) or people who inject with drugs (PWID), unless there were other factors that increased likelihood of transmission (e.g. a deep exposure or blood bolus injected or a sharps exposure from a PWID particularly in the context of a local outbreak). Please see also table 6 *HIV PEP recommendations by type of exposure and source status*.

[4] Strong recommendation against, low certainty evidence

Evidence to decision

Benefits and harms

The risk of HIV transmission is very low, the potential toxicity and inconvenience of PEP is likely to outweigh the benefit unless there is a clear specific extenuating factor which increases the risk.

Certainty of the Evidence	Low

If the HIV status of the source is unknown, a careful risk assessment should be carried out. PEP is unlikely to be justified in the majority of such exposures [19, 20]. In the case of a significant exposure, every effort should be made to ascertain the HIV status of the source. If the exposure involves a source person with either unknown HIV status or unknown identity it is not possible to give reassurance that the risk of HIV infection is zero. However, it may be possible to estimate risk (e.g. is the source from a high-risk group such as PWID, gbMSM or from a country of high prevalence). For further information, please see Table 8 *Risk of HIV transmission per exposure where source is known to be living with HIV and not on ART* and Table 9 *Estimated risk of HIV transmission by type of exposure where source HIV status is unknown.*

HIV PEP would generally not be recommended unless there were other factors that increased the risk of transmission, such as inoculum of blood having been injected. In the case of a needlestick injury from an untested gbMSM, the small risk of transmission along with the potential toxicity and inconvenience of PEP should be directly discussed with the patient. The decision must be based on a case-by-case basis using clinical discretion and taking into account the preferences of the attendee [1].

Values and preferences

The evidence supports that the risk of HIV transmission following a sharp or mucosal splash injury where the index case is untested and from a high-risk group is very low. However, certain factors may increase the risk of transmission. Where the decision is made by a health professional not to prescribe HIV PEP, it is likely that this outcome will be of similar importance to the patient and only a small proportion of people would not want the recommended course of action.

Recommendation 5

NOT recommended	GRADE 1C[5]
HIV PEP is **NOT recommended** following a sharps or mucosal splash exposure if the index case is untested but from a group with lower HIV prevalence than the general population (see table 6 *HIV PEP recommendations by type of exposure and source status.*) [20, 21].	

[5] Strong recommendation against, low certainty evidence

Evidence to decision

Benefits and harms

The risk of HIV transmission is negligible, and the potential toxicity and inconvenience of HIV PEP is likely to outweigh the benefit.

Certainty of the Evidence	Low

If the HIV status of the source is unknown, a careful risk assessment should be carried out. PEP is unlikely to be justified in the majority of such exposures [20; 21].

For further information, please see Table 8 *Risk of HIV transmission per exposure where source is known to be living with HIV and not on ART* and Table 9 *Estimated risk of HIV transmission by type of exposure where source HIV status is unknown.*

Values and preferences

Where the HIV status of the index case is unknown and in situations where the risk is negligible, HIV PEP would not be recommended. Where the decision is made by a health professional not to prescribe HIV PEP, it is likely that this outcome will be of similar importance to the patient and only a small proportion of people would not want the recommended course of action.