

09/06/2005

**Blood Testing following Criminal Incidents
where there is a risk of infection: Proposals for
Legislation**

**Health Protection Scotland's response to a request
from the Scottish Executive for expert advice on key
aspects of the responses to the Consultation paper
"Blood testing following criminal incidents where
there is a risk of infection: Proposals for Legislation"**

Blood Testing following Criminal Incidents where there is a risk of infection: Proposals for Legislation

Health Protection Scotland's Response to the Proposals

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for the Scottish Executive
(taking into consideration comments from Dr Syed Ahmed² and Dr Sandy Elder³)**

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Introduction

In 2002, the Scottish Police Federation (SPF) submitted a petition to the Scottish Parliament Petitions Committee, requesting legislation to make it compulsory for assailants and others who have caused police officers to be exposed, or potentially exposed, to the risk of blood borne infection, to submit to a blood test, so that the officer concerned can be informed as soon as possible of whether there was a real possibility of infection.

In response to the proposal, the Scottish Executive Justice Department published the consultation paper "Blood testing following criminal incidents where there is a risk of infection: Proposals for Legislation" [1], in which, they propose "mandatory blood testing for those who commit serious physical or sexual assaults and thereby put the victim of crime at risk of infection with a prescribed blood-borne virus". Responses to the consultation paper were sought, amongst others, from the Expert Advisory Group on AIDS (EAGA) and the Advisory Group on Hepatitis (AGH) which provide scientific advice to the UK Health Departments on matters relating to AIDS and Hepatitis.

Following receipt of the responses, the Chief Medical Officer asked Health Protection Scotland and, through it, other relevant experts in Scotland, to ".....consider the technical and medical issues raised by the consultation and the underlying evidence, especially the advice from EAGA and AGH; comment on how best practice could be developed in Scotland with or without mandatory testing; and advise the Executive on any further questions that might be put to EAGA and AGH. Ethical issues on the question of care and counselling for the

accused person are outside the scope of these question, though, of course, HPS and other bodies are welcome to comment on those matters as part of the general consultation process." (Mr Bill Barron, Scottish Executive Justice Department in a letter to the Medical Director of HPS, Dr Martin Donaghy, on 16th May 2005)

Blood borne infection principally applies to the Human Immunodeficiency Virus (HIV), the Hepatitis C Virus (HCV), and the Hepatitis B Virus (HBV). In the Proposals for Legislation there is reference to the legislation also applying to assailants and others who have caused individuals who are not police officers to be exposed, or potentially exposed, to the risk of blood borne virus infection. However, it is understood that the proposals, primarily, are aimed at protecting police officers, as the authors of the proposed legislation do not provide any information indicating that there are concerns among members of the general public, who might be exposed to the risk of blood borne infection through assault such as rape.

Accordingly, HPS will consider the questions, posed by Mr Bill Barron, as above, in the context of the proposals applying to police officers and their assailants only.

Methods

In the preparation of this report, the following actions were undertaken: 1) a review of the nature and risk of infection from blood-borne virus exposures, 2) a review of the current diagnostic tests for blood borne viruses to facilitate understanding of how the tests work and what molecular markers these tests use to pinpoint infection 3) expert advice was sought from the Scottish Blood Transfusion Service on the practicalities of using the tests and 4) a review of current national and international guidelines for the management of occupational and non-occupational exposure to BBV. Comments on this report were also sought from a number of key stakeholders within Scotland who are experts in this field

Question 1: Consider the technical and medical issues raised by the consultation and the underlying evidence, especially the advice from the Expert Advisory Group on AIDS (EAGA) and the Advisory Group on Hepatitis (AGH)

EAGA and AGH both considered the questions contained in the Scottish Justice Department's Consultation paper but their discussions focused on the underlying principles and the proportionality of the proposed measures to the risk of BBV transmission following potential exposure

The EAGA response concluded that "..... the proposed measures are disproportionate to the risk of acquiring HIV and compulsory testing of the perpetrator of an assault will not materially affect the immediate medical management of the victim of the assault. It is

longstanding Government policy to encourage those who may have been at risk of infection with a blood borne virus to undergo voluntary and confidential testing with informed consent. EAGA does not support the introduction of legislation to compel individuals to be tested for blood borne viruses.”

The AGH did not support the mandatory testing proposals, and considered the measures proposed to be “disproportionate to the risk of blood borne virus transmission in police officers following occupational exposure”.

HPS assessed the likely reduction in the risk of infection of the proposed legislation by considering:

1. The nature of the problem i.e. the viruses involved, how people are exposed to them and the risk of infection from that exposure
2. The extent of the problem i.e. the number of police officers occupationally exposed to blood-borne viruses
3. The benefit conveyed by knowing the perpetrator’s blood-borne virus status

1.1 The nature of the problem

- **HIV**

The risk of acquiring HIV through i) exposure to saliva, ii) a bite, iii) skin coming into contact with blood and iv) sustaining a percutaneous injury involving a used needle outside the healthcare setting, is extremely low; this is manifested by the fact that only a handful of scientific reports on transmissions occurring through these routes can be traced in the scientific literature [2,3,4,5]. In the context of HIV transmission having been exhaustively investigated over the last twenty years, the lack of evidence for transmission of HIV through these routes suggests that the risk of infection is extremely low

- **HCV**

The risk of acquiring HCV through exposure to saliva, a bite, contact with blood or a needlestick injury outside the healthcare setting is very low though slightly greater than that for HIV [6,7]. Similarly, only a handful of scientific reports indicating that transmission has occurred through such exposures have been reported in the context of 15 years of investigation into different modes of HCV transmission [8,9,10]. The AGH, in its response to the proposals in legislation, cited evidence from Amsterdam, which indicated no HCV (or indeed other blood borne virus) transmission among 112 police potentially exposed to blood borne viruses in the context of their work (over a four-year period from 2000-2003)[7].

- **HBV**

The risk of acquiring Hepatitis B through saliva, a bite, skin contact with blood or a needlestick injury outside the healthcare setting is considerably greater than that for HIV and HCV but only if the source is viraemic (approximately 1 in 5 individuals who are surface antigen positive)[11]. However, in contrast to HIV and HCV, pre-exposure prophylaxis is available for HBV in the form of a vaccine against the virus. Departments of Health recommend that police officers who are at risk of exposure to body fluids should be vaccinated against Hepatitis B [11]

- **Quantifying the risks of transmission**

Health Protection Scotland considers that the incident which poses the greatest blood-borne virus risk to a police officer is the percutaneous injury involving a used needle from an injecting drug user. The risk of transmission in this context is dependent on the prevalence of the blood-borne virus among injecting drug users, the type of injury sustained, the viability of the particular virus outside the body and how recently the needle has been used.

Table 1 provides estimates of an individual's risk of BBV transmission in this context. For each infection, a risk has been calculated for a percutaneous injury following a very short interval (seconds/few minutes), an intermediate interval (minutes/hours) and a long interval (hours/days) since the needle was used.

Infections	Probability of infection in the IDU population in Scotland	Risk of transmission if exposed ¹	Estimated risk following exposure to needle		
			Very short interval after use (seconds/minutes)	Intermediate interval after use ² (minutes/hours)	Long interval after use ² (hours/days)
Blood borne					
HIV	1/100 ³	1/300	1/30,000	1/3,000,000	1/30,000,000
HBV	1/33 ⁴	1/3 (eAg+ve) 1/17 (eAg-ve)	1/100 1/560	1/1,000 1/5,600	1/10,000 1/56,000
HCV	1/3 ⁵	1/50 ⁴	1/150	1/15,000	1/150,000

¹ The risk of transmission following percutaneous injury from an infected source [11,12]

² Adjusted by an estimated factor of 1/10 (HBV) and 1/100 (HIV and HCV) for an intermediate interval scenario and of 1/100 (HBV) and 1/1,000 (HIV and HCV) for a long interval scenario to account for the reduced viability of the particular virus outside the body and how recently the needle has been used

³ Based on a 1% prevalence among injectors in Scotland who sought a voluntary attributable HIV test in 2004

⁴ Based on a 3% prevalence of surface antigen positive injectors - derived from an unlinked anonymous HBV survey of injectors in Glasgow who sought a voluntary attributable HIV test 2001

⁵ Based on a prevalence of HCV among injectors in Scotland being around 35% (if the spontaneous clearance of HCV infection is accounted for [13])

The potential for a police officer to acquire HIV through a percutaneous injury involving a used needle from an injecting drug user is very low. The potential for HCV transmission is higher than that for HIV because of HCV's greater efficacy for percutaneous transmission and a greater prevalence of HCV RNA among injecting drug using populations. The risk of acquiring Hepatitis B is greater than that for HIV and HCV but only for those who have not been immunised or those who have not responded to the vaccine. For all types of infection, the

risk decreases markedly if the interval between the use of the needle and the person being exposed is greater than a few seconds or minutes.

1.2 *The extent of the problem*

Evidence that there is a problem is documented in the Proposals for Legislation and in Mr Keil's petition to the Scottish Parliament which records case histories on thirteen affected police officers. This states that "actual cases of infection as a result of such incidents are, thankfully, rare, but cases where an officer feels at risk are much more common. The SPF (Scottish Police Federation) has advised us that in the year 2003-04, there were 229 incidents in which there was a possible risk of infection to an officer. In 24 of these, the risk was considered serious enough for the officer to embark on post-exposure prophylaxis against HIV but in only one incident is an officer thought to have been actually infected, with Hepatitis B." No NHS data is available in Scotland or other parts of the UK to provide more in depth details of these incidents. Follow-up of the police officer who had contracted Hepatitis B infection revealed that this individual had not received Hepatitis B vaccination, or post-exposure prophylaxis (vaccine plus immunoglobulin) following two assaults, which preceded his acute Hepatitis B infection illness. No assailants were tested for Hepatitis B. Thus, we cannot conclude with total confidence that the police officer contracted Hepatitis B as a result of the assault(s). However, we recognise this is a possibility.

Case histories are helpfully provided in thirteen instances. All involve assaults where the police officer is spat on (including in the mouth), has his/her skin exposed to blood, is bitten or sustains a percutaneous needlestick injury. In many instances the assailant, allegedly, is a drug user/injector. It is unclear on what basis HIV PEP has been recommended in the instances it has. It is also unclear, in most instances, as to whether or not blood borne virus infection tests on the assailant were requested and whether this request was agreed to. Furthermore, it is unclear as to whether or not police officers had been vaccinated against Hepatitis B.

1.3 *The benefit conveyed by knowing the perpetrator's blood-borne virus status*

- **HIV**

Decisions about prescribing PEP should follow a full risk assessment of the incident, based on the circumstances of the exposure; if the initial assessment indicates that an exposure has been significant - that is, with the potential for HIV transmission - consideration should be given to the HIV status of the source. Current guidance for managing occupational exposures in the healthcare setting recommend that, if the HIV status of the source is not known, the source should be asked to consent to testing for HIV; if the source patient is approached in a sensitive manner, it is understood that consent to testing is rarely withheld [11]. The SPF, do not indicate what proportion of assailants, asked to provide blood for HIV testing, refuse to provide it either immediately after the incident or within a few days of the incident. This lack

of information makes it difficult for us to estimate, when comparing the impact of mandatory testing with that of voluntary testing, how many more police officers who had sustained an exposure would get to know the HIV status of the assailant.

Where considered appropriate, PEP should be commenced as soon as possible after the exposure event, ideally within the hour. If there are obstacles to obtaining consent, EAGA recommend that the decision to initiate PEP should be based on the available information [11]. In view of it taking up to two weeks to get the result of a mandatory HIV test, the decision to commence PEP will not be altered by the legislation. It is likely, however, that knowing the HIV status of the source would allow a decision to be taken as to whether the course of PEP should be continued (HIV positives) or discontinued (HIV negative). This issue is explored further in question 2.

The exposure to potentially infected body fluids is always stressful to the exposed person. As a result, information about the HIV status of the assailant has the potential to alleviate anxiety. However the potential benefits for the exposed person from mandatory testing of the assailant must be balanced against any disbeliefs to the latter as a consequence of this action. In other areas of public health, deciding in favour of the benefit of the interests of one member of the community against those of another can only be justified if the risk to the overall community from an infection or other type of disease can be eliminated or significantly reduced by overriding one or others' rights. HPS is of the view that the extremely low risk of HIV transmission following the type of exposure posing the greatest risk to police officers (see Table 1), is such that the benefit conveyed to the exposed individual, by knowing a source's HIV status, is insufficient to justify mandatory testing of the assailant even though this could result in levels of anxiety being lowered. **In addition, it should be noted that the proposed legislation would not reduce the risk of HIV acquisition.**

- **HCV**

The risk of HCV transmission through an exposure is higher than that for HIV but is still very low. Needlestick injuries involving a needle from an injecting drug user source convey the greatest risk. No HCV PEP is available. Police officers sustaining an exposure involving an abandoned needle which has clearly been lying for many hours/days are probably not at any appreciable risk of HCV infection. In instances where the interval between the exposure and the needle having been used for injecting is minutes/an hour or two, the risk still remains low but HCV testing of the individual exposed should probably be recommended.

In the occasional higher risk instance, as above, knowing the source's HCV status would be beneficial in allaying anxiety but, as indicated for HIV, HPS are of the opinion that the benefit conveyed to the exposed individual, by knowing a source's HCV status, is insufficient to justify

mandatory testing of the assailant. **It should be noted that the proposed legislation would not reduce the risk of HCV acquisition.**

- **HBV**

While the risk of acquiring Hepatitis B for those who are non-responders or those who did not receive any vaccination, through an exposure is considerably greater than that for HIV and HCV (if the source is viraemic), the benefit conveyed by knowing a source's HBV status to reduce the anxiety is minimal if the appropriate action is taken – namely post exposure prophylaxis with immunoglobulin plus vaccine [14]. Therefore, HPS does not believe on these grounds there is sufficient justification for mandatory testing of the assailant for HBV. **It should be noted that the proposed legislation would not reduce the risk of HBV acquisition.**

Question 1 conclusion

The psychological morbidity experienced by police officers following exposures to body fluids is a real and important issue. However, we have to consider the potential benefit to police officers of reducing anxiety in relation to concerns about the acquisition of blood-borne virus infection within the overall public health context. If incidents are managed appropriately the risk of acquisition of a blood borne virus infection, already very low, would be reduced even further. Mandatory testing will not improve this. If police officers at risk of exposure to body fluids are vaccinated against HBV, there will be no risk of acquiring one very serious infection.

The potential benefits from mandatory testing apply to the exposed person through the reduction of anxiety. This must be balanced against any harm which could be experienced by the assailant as a consequence of testing them against their will. In other areas of public health, deciding in favour of the benefit of the interests of one member of the community against those of another member can only be justified if the risk to the overall community from an infection or other type of disease can be eliminated or significantly reduced by overriding one or others' rights. This is not the case with this proposal. Therefore, HPS does not believe that the benefit from knowing a source's blood-borne viral status is sufficient to justify mandatory testing of the assailant.

Question 2: How can best practice be developed in Scotland with or without mandatory testing?

Current UK guidelines for the management of occupational exposures are based on recommendations from the Expert Advisory Groups on AIDS and the Advisory Group on Hepatitis. These guidelines recommend that, following exposure to potentially infectious body fluids, the individual who sustained the exposure should report it promptly and an appropriate

risk assessment should be performed urgently, by someone other than the exposed individual, to enable provision of post-exposure prophylaxis according to current recommendations [11,15]

- **HIV**

In EAGA's HIV PEP guidance, applicable to health care workers only, it states (in paras 24 and 35) that "PEP should be recommended to health care workers if they have had a significant occupational exposure to blood or another high risk body fluid from a patient or other source either known to be HIV infected, or considered to be at high risk of HIV infection but where the result of an HIV test has not or cannot be obtained, for whatever reason. Significant occupational exposure is defined as i) percutaneous injury (from needles, instruments, bone fragments, significant bites which break the skin, etc.), ii) exposure of broken skin (abrasions, cuts, eczema, etc) and iii) exposure of mucous membranes including the eye [15].

In Almeda et al's paper, published in *Eurosurveillance Monthly* in 2004 on "proposed recommendations for the management of HIV post-exposure prophylaxis after sexual, injecting drug use or other exposures in Europe" – a report on behalf of the Euro-NONOPEP Project Group – it states that NONOPEP (i.e. HIV PEP in non-occupational circumstances) should be discouraged if an individual sustains a "needle exposure" accidentally in the context of an abandoned needle or deliberately in the context of "aggression"; only in "high risk areas" (prevalence of HIV infection in the IDU population concerned being greater than 15%) might NONOPEP be considered in the above circumstances. Further, the group recommends that NONOPEP for other exposures (non-intact skin, mucosal, bite, etc) should be discouraged if the source person's HIV status is unknown or the source person is not from a group or from an area with a high HIV prevalence and should only be considered if the source person is HIV positive, or is from a group or from an area with a high HIV prevalence - at least 20% (in Scotland the prevalence is less than 1%) [16]. The recommendation of the discouragement of PEP in these circumstances reflects the Project Group's view that the above body fluid exposures convey an extremely low or nil risk of HIV transmission. HPS supports the recommendations from the Euro-NONOPEP Project Group.

A benefit to the exposed person from knowing the assailant's HIV status is in enabling a decision to be taken, on receipt of a result, as to whether PEP should be continued or discontinued. HPS acknowledges the unpleasant side effects of the drugs used for PEP, and the difficulties that the exposed may encounter adhering to, and tolerating the drug regimen. HPS also acknowledges that the exposed would benefit from being able to stop PEP if a diagnostic test could confirm there was no evidence of i) infection in the assailant or ii) seroconversion in the exposed. The question is whether the benefit to the exposed person, from a test of the assailant that may result in the discontinuation of PEP, is such that it

represents sufficient grounds to overrule an individual's right not to consent. We concur with the EAGA statement that "Applying for a mandatory testing order has the potential to shorten the duration of post-exposure prophylaxis related side effects and the psychological distress where a negative result is obtained, but will not eliminate them". This is in line with our view expressed in the conclusion to question 1.

One way of allaying anxiety in the exposed person would be if there were a test which could establish early whether he or she has been infected. Recent advances have indicated that testing directly for RNA (the genetic material of many viruses) rather than waiting for the body producing antibodies may provide such a benefit. While HIV RNA in the exposed individual can be detected around 10 days from infection, early diagnosis in the exposed individual, using HIV RNA testing, is not recommended for various reasons including the following: the positive predictive value of the assay is sub-optimal in the diagnostic context [17] and the use of HIV PEP can have an inhibitory effect on viral replication, resulting in a false negative test result [18]. Examination of six sets of British[15,19] European [20,16]and US guidelines [21,22] on HIV testing (either in or not in relationship to the administration of HIV PEP), indicates that only HIV antibody tests should be performed on individuals at risk of acquiring HIV, and that these should be undertaken at baseline, 4-8 weeks, 3 months and 6 months, depending on circumstances, in particular whether or not HIV PEP has been given and the extent of the risk.

To conclude, there is no HIV test that can be performed on the exposed person during the period in which PEP is being taken which would provide a definitive result to allow a decision to be taken as to whether or not a course of PEP should be discontinued.

- **HCV**

No HCV PEP is currently available. Health Protection Agency guidelines, published in 1999, on HCV testing following occupational exposure to HCV recommends that where the source is known to be HCV infected, a baseline serum specimen is obtained for storage and tests for HCV RNA are undertaken at 6 and 12 weeks, and anti-HCV (HCV antibody) at 12 and 24 weeks. Where the HCV status of the source is unknown the following are recommended; if the source is a "high risk" individual (e.g. an injecting drug user), the testing arrangements are the same as those if the source was known to be HCV infected; if the source is not considered to be high risk for HCV, a baseline serum specimen is taken for storage and an HCV antibody test at 6 months is recommended [23].

The AGH recommends in their response to the consultation paper that "Testing [of the exposed person] for HCV RNA following occupational exposure is normally advised at 6 and 12 weeks but tests can be done as early as 2 weeks. It must be stressed that it may not always be possible to detect HCV at 2 weeks in all patients who develop Hepatitis C infection.

However, it might allay initial anxiety with proper counselling, while awaiting a definitive answer at 6 weeks. Any positive results would allow early treatment to start".

HPS supports the use of HCV RNA tests at 2 weeks post exposure as this could help allay anxiety with regard to this infection. However, appropriate counselling is necessary to ensure that the exposed individual is aware of the possibility of a false negative result and the need for further follow-up tests.

- **HBV**

For those individuals who are non-responders or did not receive any vaccination, PEP (immunoglobulin plus vaccine) is recommended. For those receiving PEP, anti-HBsAg testing should be undertaken at 3 and 6 months; where anti-HBsAg is not detectable, the specimen should be tested for anti-HBc and HbsAg [14]. Assuming police officers receive the necessary pre-exposure vaccination and, if necessary, PEP, the risk of infection from exposure to the body fluids of a chronically infected individual is virtually nil.

Question 2 conclusions

There is some anecdotal evidence of insufficient expertise in assessing exposure and it would appear that PEP might be being recommended inappropriately.

The major issue with management however appears to concern how best to support the exposed person, in this case police officers, at a time of great anxiety. With regard to this, HPS supports the response made by Dr Gordon Scott on behalf of SHIVAG (Scottish HIV/AIDS Group).

"I acknowledge without reservation the considerable anxiety experienced by police officers as a result of these incidents, but the proposed legislation leaps many bounds beyond the steps that could meaningfully be taken to minimise that anxiety. SHIVAG proposes that immediate specialist advice be available to police officers (and any other members of the public exposed to potential risks) on a 24 hour basis. This advice would be backed up by an agreed protocol encompassing risk assessment, circumstances when voluntary testing of the source would be sought, and grounds for prescribing PEP for HIV. We believe that access to specialist advice is the most appropriate route to alleviation of anxiety for police officers and would be in keeping with the response to the management of incidents in health care settings."

Furthermore, HPS recommends that

- a thorough audit of the procedures for managing police officers occupationally exposed to body fluids – this should include the following: i) the circumstances surrounding the incident, ii) an estimate of the level of blood borne virus infection

risk, iii) the appropriateness of the action taken (information and advice given and testing/PEP recommendations made), iv) psychological morbidity experienced, v) information as to whether or not blood borne virus tests/information were requested from the assailant(s), vi) Hepatitis B vaccination history, and vii) police officers knowledge about the issues relating to such incidents. The results of the audit should inform the improvement of procedures involved in the management of such exposures.

- the Scottish Police Forces ensure that police officers who are at risk of exposure to body fluids are offered and recommended vaccination against Hepatitis B, in accordance with current Departments of Health guidance.

Question 3. Any further questions that might be put to EAGA and AGH?

HPS considers that the following question should be put to EAGA and AGH:

Do the advisory groups consider that existing guidelines for the management of occupational and non-occupational exposures to blood-borne viruses provide sufficient guidance for managing incidents where police officers are exposed to the body fluids of assailants?

Summary of conclusions

HPS appreciates that the psychological morbidity experienced by police officers following exposures to body fluids is a real and important issue. However, HPS does not believe that in public health terms, the benefit conveyed to the exposed individual, by knowing a source's blood-borne virus status, is sufficient to justify mandatory testing of the assailant, and therefore supports the views of the Expert Advisory Group on AIDS (EAGA), the Advisory Group on Hepatitis (AGH) and the Scottish HIV/AIDS Group (SHIVAG)

HPS also supports the Euro-NONOPEP Project Group recommendation for the management of HIV post-exposure prophylaxis after sexual, injecting or other exposures and, in agreement with current guidelines, does not support the use of HIV RNA testing during the period of PEP, to inform the decision to discontinue PEP.

HPS recommends that improvements in measures to alleviate the psychological morbidity experienced by some police officers following exposure to assailants' body fluids should be undertaken.

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