Guideline

Community needle stick injury

Document ID	CHQ-GDL-65665	**Version no.**	2.0	**Approval date**	19/02/2019
Executive sponsor	Executive Director Medical Services			**Effective date**	19/02/2019
Author/custodian	Director, Infection Management and Prevention Services, Rheumatology and Immunology (QCH)			**Review date**	19/02/2021
Supercedes	1.0				
Applicable to	All Children's Health Queensland				
Authorisation	Executive Director of Clinical Services (QCH)				

Purpose

This guideline provides best practice recommendations for the immediate assessment, management and follow-up of children who have sustained a community acquired needle stick injury. This guideline was developed in consultation with experienced Paediatric Infection Specialists.

Scope

This guideline provides information for all Children's Health Queensland (CHQ) employees (permanent, temporary and casual) and all organisations and individuals acting as its agents (including Visiting Medical Officers and other partners, contractors, consultants and volunteers) caring for paediatric patients.

Related documents

Procedures, Guidelines, Protocols

- CHQ-GDL-65664 Paediatric Guideline: Post-Exposure Prophylaxis for HIV
- Queensland Health – Clinical Information about HIV and AIDS. Post-exposure prophylaxis (PEP)

Acronymns

BBV	Blood borne virus
CHQ	Children's Health Queensland
CNSI	Community (acquired) needle stick injury
ED	Emergency department
GP	General Practitioner
HBIG	Hepatitis B Immunoglobulin
HBsAb	Hepatitis B surface antibody
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HIV	Human Immune deficiency virus
IDU	Injection drug use
IMPS	Infection Management and Prevention Service
IM	Intra-muscular injection
IU	International units
LMO	Local Medical Officer
MO	Medical officer
PEP	Post-exposure prophylaxis
QCH	Queensland Children's Hospital
QSIS	Queensland Specialist Immunisation Service
STI	Sexually transmitted infection
TIG	Tetanus Immunoglobulin

Guideline

Management of community needle stick injury (CNSI):

Presentations of children to Emergency Departments (ED) following accidental needle stick injury are not uncommon and such injuries may be a significant source of anxiety. It is important to note that CNSI in the common scenario of accidental exposure to needles found in parks etc. are of very low risk of blood borne virus (BBV) transmission, with cases of BBV transmission by such CNSI not being documented in Australia.

Key aspects of the management of CNSI are:

- First aid
- Assessing injury
- BBV transmission risk
- Assessing and managing Tetanus and Hepatitis B immunity status
- Organising follow up serology and reassurance
- HIV post-exposure prophylaxis (PEP) is only a consideration in exceptional circumstances with higher risk exposures.

Recommendations are contained in the flow chart and notes below. The QCH Infection Management and Prevention Service (IMPS) are available for advice on the management of a child with CNSI, the (unlikely) need for PEP and to discuss follow-up (contact via QCH Switchboard).

PEP, if required, should be prescribed as soon as possible after the exposure and within 72 hours. A separate and linked guideline provides information on HIV PEP, which may be recommended in discussion with QCH IMPS in very high risk non-occupational BBV exposures.

COMMUNITY NEEDLE STICK INJURY

FIRST AID

Allow to bleed (if applicable)
Wash with soap and water

HISTORY AND RISK ASSESSMENT

Details of injury
Source status if known
(Sections 1, 2 & 3 on p.5)

ASSESS IF EXPOSURE IS HIGH RISK FOR BBV
(Section 3 on p.5 and Table 1)

IF HIGH RISK:

- Discuss HIV PEP with IMPS (very rare for community-acquired needlestick injury to be high risk).
- HBIG will be indicated unless documented immunity.

ASSESS TETANUS IMMUNISATION STATUS
Tetanus immunisation (TIG) (Table 2)

ASSESS HEPATITIS IMMUNITY
(Section 4 on p.6)

Establish immunisation history.

Request baseline serology: Hepatitis B (HBsAb (urgent), HBsAg), Hepatitis C, HIV ab.

HBsAb result: unless immunity previously documented, request urgently (within 72 hrs) to allow for immunisation if indicated.

HEPATITIS B IMMUNE STATUS?

Never Hepatitis B immunised or incomplete Hepatitis B immunisation (less than 3 doses):
Give HBIG and HBV vaccine and refer to LMO or QSIS (QCH) for completion of HBV vaccines at 1 and 6 months post exposure (Section 5 on p.7)

Do not wait for HBsAb result if never immunised.

Hepatitis B immunised

Organise for HBsAb result review and patient recall by ED for HBIG/HBV if indicated and for baseline serology results to be communicated

HBsAb less than 10 IU/mL (Section 5 on p.7)
Low risk exposure: HBV vaccine as soon as possible (but within one week).
High risk exposure: HBIG (within 72 hours) and HBV vaccine

Hepatitis B immune: Fully immunised and HBsAb more than or equal to 10 IU/L previously or on current test. No further action regarding Hepatitis B immunisation.

FOLLOW UP
For low risk exposures refer to LMO for follow up testing – HIV, Hepatitis C and B (if initially non-immune) serology at 3 months post exposure (this guideline can be provided to GPs).

Section 1. Details of injury (CNSI)

Mechanism:	e.g. accidentally picking up needle, stepping on needle, stuck by another person, unwitnessed injury and child too young to tell.
Exposure type:	e.g. hollow bore needle, syringe barrel attached / not attached, gauge of needle.
Location:	e.g. park, beach, back alley, home, others.
Disposal:	if the discarded needle(s) still need(s) to be removed from a public area, call the Clean Needle Helpline on 1800 633 353 to arrange for proper disposal.

Section 2. Source

While it is important to ascertain the status of the source, this may not be possible if injury is sustained in a public area. The relative risk of the source being positive for BBV based on local prevalence and risk behaviours should be considered when giving recommendations concerning prophylactic measures. In Australia, the level of HIV infection in injecting drug users is below 3% and HIV incidence (percentage of new people infected each year) below 1%.[1]

Section 3. Risk assessment

The risk of BBV transmission is dependent on the type of injury and the infection status of the source. The risk of acquiring BBV infection from discarded injecting equipment is extremely low. No cases of HIV infection in Australia have ever been identified due to discarded injecting equipment[2] (Table 1).

Factors that increase risk of BBV transmission

- Deep injury
- Device visibly contaminated with blood
- Needle directly placed into artery or vein
- Shared needles used for injecting drugs
- Source known to have untreated or advanced HIV/Hep B/C infection
- Hollow bore needles.[3]

HIV is a fragile virus outside the body, especially when exposed to unfavourable external environmental conditions. The blood volume in discarded needles is likely to be less than that associated with exposures in the health care settings.[4]

Table 1. Risk assessment for transmission of Blood Borne Viruses (BBV)* following CNSI

	PROBABILITY OF INFECTON		
	Hospital Related Needle Stick Injuries	**Community Acquired NSI**	
	NSI in health care worker [3] (source status known)	**When the origin of needle is known** - data from needle sharing in injecting drug users of unknown status [1]	**When the origin of needle is unknown ****
Hep B	Up to 30% if source is HepBag +ve		Unknown but at worst may be ~ 30% if source HepB ag +ve and child not vaccinated
Hep C	1.8% (range 0 - 7%) if source Hep C RNA +ve	1.3 - 4.9% ***	Unknown but anticipated to be far less than previous column
HIV	~ 0.3% if source known to be HIV +ve ****	0.0063% - 0.0084% ***	Data from various sources [5] 1/4000 - 1/10000 [6] 0/50, Dublin study [7] 0/36, Melbourne study [8] 0/101, Madrid study

* BBV are viruses transmissible by significant exposure to contaminated bodily fluids and identifiable by current conventional laboratory methods e.g. Hep B, Hep C and HIV

** Most likely scenario presenting to Emergency Department

*** Results based on an prevalence of ~65% and <3% of HCV and HIV infections respectively in IDU's in Australia, and a carrier rate of 80% and 100% for HCV and HIV respectively. [1]

**** If the blood on the outside and inside surfaces of the needle has dried the risk of HIV transmission is probably lower than 0.3% since the concentration of HIV diminishes by 90-99% within several hours after drying and continues to decrease gradually thereafter. [9,10]

Section 4. Serology

- Obtain verbal consent and provide pre-test counselling. Pre- and post-test counselling are important with respect to HIV and Hepatitis. A positive baseline test for HIV, Hepatitis B or C may indicate that the child has acquired the infection by mother to child transmission.
- Request (baseline) Hepatitis B (HBsAb & HBsAg), Hepatitis C and HIV serology. Hepatitis C and HIV are not essential for low risk exposures.
- Mark HBsAb "**URGENT**" and request laboratory staff to ring result through to ED.
- HBV serology is performed daily. On weekends and public holidays serology may be performed on next working day; this will generally be able to provide the result to action within 72 hours of exposure. If a long weekend, contact laboratory and discuss availability of earlier testing. Where this guideline is being used outside of QCH, please confirm testing arrangements with relevant pathology provider
- **Do not send the needle or syringe for testing**, as results on discarded injecting equipment are unreliable (and not generally performed by diagnostic laboratories).

Section 5. Hepatitis B immunisation

HBIG – to obtain at QCH call Blood Bank on **(07) 3068 3555**.

- Administer within 72 hours of injury (by intramuscular (IM) injection)
- Recommended schedule:

  Up to 30 kg 100 international units (IU)
  More than 30 kg 400 international units (IU)

  Note: HBIG comes in vials of 100 IU and 400 IU (concentration is approximately 100 IU per mL).

- HBIG can be given and HBV vaccination commenced as soon as possible, but up to 7 days after exposure (**Note**: Limited evidence for efficacy for later treatment – early treatment preferred).

Hepatitis B vaccine (IM)

- For all less than 20 year old: Paediatric Engerix B® (10 microgram) 0.5 mL at 0, 1 and 6 months.
- *Alternative for 11 to 15 year olds (only):* Adult Engerix B® (20 microgram) 0.5 mL at 0 and 6 months.
- Arrange appropriate follow up with local medical provider (e.g. GP).
- Hepatitis B vaccine repeated at 1 (if required; see above) and 6 months after 1st dose.
- Repeat serology Hep B (HBsAb & HBsAg), Hep C antibody and HIV antibody at 3 months.

Section 6. HIV post exposure prophylaxis

If due to exceptional circumstances, HIV PEP may be appropriate, see CHQ-GDL-65664 Paediatric Guideline: Post-Exposure Prophylaxis for HIV and contact QCH Infectious Diseases to discuss.

Section 7. Management of Tetanus immunisation status

Needle stick injuries are regarded as 'tetanus prone wounds'.

For full details on management of tetanus immunisation, please refer to the Australian Immunisation Handbook.

Table 2. Tetanus prophylaxis in CNSI

History of tetanus vaccination	Time since last dose	Give appropriate tetanus booster vaccine	Tetanus immunoglobulin
More than or equal to 3 doses	Less than 5 years	NO	NO
More than or equal to 3 doses	5 to 10 years	YES	NO
More than or equal to 3 doses	More than 10 years	YES	NO
Less than 3 doses or uncertain	-	YES	YES

Also refer to the CHQ-GDL-01023 Tetanus Prophylaxis in Wound Management, which has information on appropriate booster vaccines.

Acknowledgement

Children's Health Queensland would like to acknowledge the contribution made by:

- Dr Pam Palasanthiran, Dr Mathew O'Meara and Dr Emma Best, Sydney Children's Hospital, Emergency Department Community Needle Stick Injury: Management Protocol

Consultation

Key stakeholders who reviewed this version:

- Director – Infection Management and Prevention Service, Rheumatology and Immunology (QCH)
- Paediatric Infection Specialists, Infection Management and Prevention Service (QCH)
- Pharmacist Advanced - Antimicrobial Stewardship (QCH)

References and suggested reading

1. Crofts N, Aitken CK and Kaldor JM. The force of numbers: why hepatitis C is spreading among Australian injecting drug users while HIV is not. MJA, 1999;170:220-221.
2. Australian National Council on AIDS, Hepatitis C and Related Diseases May 2000 Information Booklet
3. Beltrami EM, Williams IT, Shapiro CN, Chamberland ME. Risk and Management of Blood-Borne Infections in Health Care Workers. Clinical Microbiology Reviews 2000 13:3 385-407
4. Resnick L et al. Stability and inactivation of HTLV III/LAV under clinical and laboratory environments. JAMA, 1986:225:1187-91.
5. Centres for Disease Control and Prevention MMWR Morb. Mort. Weekly Rep. 1989;38(S6):3-37.
6. Nourse CB, Charles CA, McKay M et al. Childhood needlestick injuries in the Dublin metropolitan area. Ir Med J. 1997; 90:66-69.
7. Russell FM, Nash MC. A prospective study of children with community acquired needlestick injuries in Melbourne. University Department of Paediatrics, Royal Children's Hospital, Melbourne. Abstract, The 2002 Annual Scientific Meeting, The Australasian Society of Infectious Diseases (ASID).
8. Aragon-Pena AJ, Arrazola-Martinez MP, Garcia de Codes A, et al. Prevention of hepatitis B and the risk of HIV infection among children injured by discarded needles and/or syringes. Atencion Primaria. 1996; 17:138-140.
9. Bell D M. Human immunodeficiency virus infection and needle stick injuries. Pediatric Infectious Disease Journal 1996: 15:3 277-278
10. Bueren J, Simpson R A, Jacobs P, Cookson B D Survival of human immunodeficiency virus in suspension and dried onto surfaces Journal of Clinical Microbiology 1994 32;2 571-574
11. Panel on Antiretroviral Therapy and Medical Management of HIV-Infected Children. Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection (December 2018). Available at http://aidsinfo.nih.gov/contentfiles/lvguidelines/pediatricguidelines.pdf
12. ANZPID Post-exposure prophylaxis (PEP) after non-occupational exposure to blood-borne viruses in children – available online: http://www.asid.net.au/groups/paediatric-id-clinical-guidelines
13. Queensland Health: HIV post-exposure prophylaxis (PEP): Adult guideline for assessment and management of non-occupational exposures. Available via intranet : https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/sex-health/hiv-aids#pep

14. Children's HIV Association Guideline : Post-Exposure Prophylaxis (PEP) Guidelines for children and adolescents potentially exposed to blood-borne viruses. Available online: http://www.chiva.org.uk/files/2814/3575/6995/CHIVA_PEP_2015_final.pdf

15. CHQ Guideline: Tetanus Prophylaxis in Wound Management. Available via intranet : https://qheps.health.qld.gov.au/__data/assets/pdf_file/0023/700628/gdl-01023.pdf

Guideline revision and approval history

Version No.	Modified by	Amendments authorised by	Approved by
1.0 (04/03/2017)	Infectious Diseases Consultant-Antimicrobial Stewardship (Infection Management and Prevention Service)	Medicines Advisory Committee (CHQ)	Executive Director Hospital Services
2.0 (19/02/2019)	Paediatric Infection Specialists, Infection Management and Prevention Service (QCH)	Medicines Advisory Committee (CHQ)	Executive Director Clinical Services (QCH)

Keywords	Post exposure prophylaxis, PEP, HIV, antiretroviral, paediatric, non-occupational, community acquired needle stick injury, hepatitis B, hepatitis C, blood borne viruses, BBV, 65665
Accreditation references	**NSQHS Standards (1-8)**: • **Standard 3**. Preventing and Controlling Healthcare Associated Infections • **Standard 4**. Medication Safety