Giving safe injections

Best Infection Control Practices for ID, IM and SC Injections

A guide for infection control practitioners

World Health Organization
International Council of Nurses
A safe injection does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous for other people.
Injection safety best practices: Outline

• Background
• Development process
• Best practices
• Discussion
Injection safety best practices: Outline

• Background
• Development process
• Best practices
• Discussion
Poor injection practices in the world

Injection overuse

Reuse of syringes without sterilization

Large-scale transmission of bloodborne pathogens
Injection safety standards

• Multiple reference documents
  – Universal precautions
  – Injection safety policy for immunization
  – Specific recommendations to use sterile equipment
  – Healthcare worker protection guidelines

• Absence of an evidence-based, exhaustive checklist for injection safety

• Use of WHO recommended processes to formulate evidence-based guidelines
Injection safety best practices: Outline

- Background
- Development process
- Best practices
- Discussion
Process for development of best practices for infection control

- Break down of a “safe injection” into critical steps
- Identification of research questions for each step
- Literature review
- Formulation of a draft best practices document
- Discussion of the document (19-20 October 2000)
- Revised draft for public comments
- Submission of the final document to a peer-review journal
Grading system for the level of evidence

• Category 1 ***
  - Strongly recommended and supported by well-designed analytical studies of observational or intervention nature.

• Category 2 **
  - Strongly recommended on the basis of strong theoretical rationale and suggestive, descriptive evidence.

• Category 3 *
  - Recommended on the basis of expert consensus and theoretical rationale.
Injection safety best practices: Outline

• Background
• Development process
• Best practices
• Discussion
• Eliminating unnecessary injections is the highest priority towards preventing injection-associated infections.

• When injections are medically indicated they should be administered safely
Four best practice areas

1. Using sterile injection equipment
2. Preventing contamination of equipment and medication
3. Preventing needle-sticks
4. Preventing access to used needles
Four best practice areas

1. Using sterile injection equipment
2. Preventing contamination of equipment and medication
3. Preventing needle-sticks
4. Preventing access to used needles
1. **Using sterile injection equipment**

Use a sterile syringe and needle for each injection and to reconstitute each unit of medication ***

Rationale:

- Reuse of injection equipment in the absence of sterilization is common
- Reuse of injection equipment in the absence of sterilization has been associated with infection with bloodborne pathogens, including:
  - HBV
  - HCV
  - HIV
1. Using sterile injection equipment

Ideally, use a new, quality-controlled single use syringe and needle **

Rationale:

- Single use syringes provide the highest level of safety
- Sterilizable injection equipment requires a quality system that is often absent in developing and transitional countries
- Health systems using sterilizable equipment usually have unsafe practices
1. Using sterile injection equipment

Discard a needle or syringe if the package has been punctured, torn or damaged by exposure to moisture *

Rationale:

- Punctures, tears and damage constitute breaks in the sealed package
- Breaks in the sealed package can lead to contamination
1. Using sterile injection equipment

If single use devices are unavailable, use sterilizable equipment. Document sterility using TST spot indicators **

Rationale:
- Disposable injection equipment should not be re-sterilized
- Only TST spot indicators can ensure the safety of the sterilization
Four best practice areas

1. Using sterile injection equipment
2. Preventing contamination of equipment and medication
3. Preventing needle-sticks
4. Preventing access to used needles
Prepare each injection in a clean designated area where blood or body fluid contamination is unlikely **

Rationale:

- HBV persists at least seven days in the environment
- HBV can be detected on surfaces in healthcare settings
- Injection preparation on surfaces where contaminated substances (e.g., blood samples) are handled can lead to infections
2. Preventing contamination of equipment and medication

Use single-dose vials rather than multi-dose vials **

Rationale:

- Many outbreaks have been associated with use of multi-dose medication vials
- Preservatives are effective but do not eradicate microbial contamination in multi-dose vials

Frequent use of multi-dose vials in a hospital in Northern Asia
2. Preventing contamination of equipment and medication

Always pierce the septum of multi-dose vials with a sterile needle *** Avoid leaving a needle in place in the stopper **

Rationale:
- A needle left in the septum of a multi-dose vial is a door open to contamination
- This practice, associated with the reuse of injection equipment on the same patient, leads to cross-infection
2. Preventing contamination of equipment and medication

Select pop-open ampoules rather than ampoules that require use of a metal file to open **

Rationale:

- Ampoules that require a metal file can break more easily and lead to laceration of fingers
- Bleeding lacerations can lead to contamination of injectable substances
2. Preventing contamination of equipment and medication

Protect fingers with a clean barrier (e.g., small gauze pad) when opening ampoules **

Rationale:
- A clean barrier may protect fingers from ampoule breaks
2. Preventing contamination of equipment and medication

Inspect for and discard medications with visible contamination or breaches of integrity (e.g., cracks, leaks). *

Rationale:
- Cracks on vials have lead to infection among patients
- Checking for cracks may detect dangerous vials
2. Preventing contamination of equipment and medication

Follow product-specific recommendations for use, storage and handling *

Rationale:
- Manufacturers recommendations are based upon the specific characteristics of the product
2. Preventing contamination of equipment and medication

Discard a needle that has touched any non-sterile surface *

Rationale:
- Hands and environmental surfaces are non sterile, particularly in healthcare settings
- Medical devices may become contaminated with bacteria if touched

Touching the needle is an unsafe practice
Four best practice areas

1. Using sterile injection equipment
2. Preventing contamination of equipment and medication
3. Preventing needle-sticks
4. Preventing access to used needles
3. Preventing needle-sticks

Anticipate and take measures to prevent sudden patient movement during and after injection **

Rationale:
- Sudden patient movement can lead to needle-stick injuries
- These needle-stick injuries can lead to transmission of pathogens:
  - From the patient to the provider
  - From the provider to the patient

Avoid the jumping syringe!
3. Preventing needle-sticks

Avoid recapping. If recapping is necessary, use a single-handed scoop technique ***

Rationale:

- Hand manipulation of needles lead to needle-stick injuries
- Two-handed recapping is associated with needle-stick injuries
- The single-handed scoop technique decreases the risk of needle-stick injuries if no sharps boxes are available
3. Preventing needle-sticks

Collect used syringes and needles at the point of use in an sharps container that is sealed before completely full ***

Rationale:
- Sharps left outside of sharps containers lead to needle-stick injuries
- Presence of sharps boxes as close as possible to patient care area reduces needle-stick injuries when associated with training

The sharps box needs to be next to the patient care area

Open containers should not be used to collect sharps
Four best practice areas

1. Using sterile injection equipment
2. Preventing contamination of equipment and medication
3. Preventing needle-sticks
4. Preventing access to used needles
4. Preventing access to used needles

Seal sharps containers for transport to a secure area. After closing and sealing, do not open, empty, reuse or sell them.*

Rationale:

- Presence of sharps outside of sharps containers leads to needle-stick injuries
- Opening, emptying or reusing sharps containers leads to needle-stick injuries
- In some countries, used syringes have a value and they can be reprocessed and repackaged, leading to infection among patients

A safety box must be closed before it is completely full.
4. Preventing access to used needles

Manage sharps waste in an efficient, safe and environment-friendly way *

Rationale:
- Many healthcare facilities in developing and transitional countries have contaminated sharps in their surroundings
- Sharps in the environment expose the community to needle-stick injuries

Healthcare waste in the environment in Africa

Use of an incinerator in Central Asia
Five other practice issues

• Use of engineered technology
• Hand hygiene
• Use of gloves for providing injections
• Swabbing vials or ampoules
• Skin preparation prior to injection and skin condition
Five other practice issues

- Use of engineered technology
- Hand hygiene
- Use of gloves for providing injections
- Swabbing vials or ampoules
- Skin preparation prior to injection and skin condition
Use of engineered technology

• Whenever possible, use devices designed to prevent needle-stick injury
• Auto-disable (AD) syringes are increasingly available to prevent reuse of injection equipment in selected settings:
  – Immunization services
  – Family planning

AD syringes
Five other practice issues

• Use of engineered technology
• Hand hygiene
• Use of gloves for providing injections
• Swabbing vials or ampoules
• Skin preparation prior to injection and skin condition
Hand hygiene

• Perform hand hygiene (i.e., wash or disinfect hands) prior to preparing injection material and giving injections

• The need for hand hygiene between each injection will vary based on:
  - Setting
  - Whether there was contact with soil, blood or body fluids

• Cover small cuts

  Hand washing

  Laceration caused by an ampoule break in the Balkans
Five other practice issues

- Use of engineered technology
- Hand hygiene
- Use of gloves for providing injections
- Swabbing vials or ampoules
- Skin preparation prior to injection and skin condition
Use of gloves for providing injections

- Gloves are not needed for injections
- Single use gloves may be indicated if excessive bleeding is anticipated
Five other practice issues

- Use of engineered technology
- Hand hygiene
- Use of gloves for providing injections
- Swabbing vials or ampoules
- Skin preparation prior to injection and skin condition
Swabbing vials or ampoules

- Swabbing of vial tops or ampoules with an antiseptic or disinfectant is unnecessary
- If swabbing with an antiseptic is selected for use:
  - Use a clean, single use swab
  - Maintain product specific recommended contact time
  - Do not use cotton balls stored wet in a multi-use container

Swabbing ampoules: Often done, but unnecessary
Five other practice issues

- Use of engineered technology
- Hand hygiene
- Use of gloves for providing injections
- Swabbing vials or ampoules
- Skin preparation prior to injection and skin condition
Skin preparation prior to injection

• Wash skin that is visibly soiled or dirty
• Swabbing of the clean skin prior to giving an injection is unnecessary
• If swabbing with an antiseptic is selected for use:
  – Use a clean, single use swab
  – Maintain product-specific recommended contact time
  – Do not use cotton balls stored wet in a multi-use container.
Skin condition

• Avoid giving injections if skin integrity is compromised by:
  – Local infection
  – Other skin conditions (e.g., weeping dermatitis).
Injection safety best practices: outline

• Background
• Development process
• Best practices
• Discussion
Scope of the best practices

• Scope limited to ID, SC and IM injections
• Other injections not addressed:
  – IV injections
  – IV infusions
  – Needle-free injections
A “Best Practices” document

- Not a standard for regulatory purposes
- Not prescriptive guidelines
- Best, not “perfect practices”
- Distill critical issues
- May be adapted
  - By programmes
  - By countries
For more information...

The SIGN Secretariat
World Health Organization

Department of Blood Safety
and Clinical Technology

Avenue Appia, 20
CH- 1211 Geneva 27
Switzerland

Email: sign@who.int
www.injectionsafety.org
Acknowledgements

Steering group

Dr Yvan Hutin (Injection safety, WHO), Anja Hauri (Injection safety, WHO), Linda Chiarello (Epidemiologist, CDC), Mary Catlin (Research Specialist, University of Arizona Cancer Center), Barbara Stilwell (Behavioural science and methodology, WHO), Tesfa Ghebrehiwet (Nursing and health policy adviser, ICN) and Julia Garner (Infection control consultant, WHO).

Guideline development group

Baheeja Abdulla (Infection control officer, Salaminya Medical Complex, Bahrain), Naima Al-Gasseer (Nursing and Midwife Services, WHO), Aranya Chaowalit (Dean, Faculty of Nursing, Prince of Songkla University, Thailand), Cynthia Chasokela (Director of Nursing Services, Ministry of Health and Child Welfare, Zimbabwe), John Nicolas Crofts (Deputy Director, Macfarlane Burnet Centre for Medical Research, Australia), Philippe Duclos (Immunization Safety, WHO), Pilar Gavinio (Hepatitis C prevention, WHO), Catherine MaCaulay (Senior Quality Assurance Advisor, The Quality Assurance Project, USA), Henry Francis (Director, Center on AIDS and Other Medical Consequences of Drug Abuse, NIDA, USA), Annette Pruess (Health care waste management, WHO) and Arnaud Tarantola (Medical Officer, Groupe d'Etude sur le Risque d'Exposition des Soignants aux agents infectieux, France).