Household waste disposal in DMPA-SC self-injection programs

Background and recommendations
Purpose of this presentation

• Share background and resources on appropriate sharps disposal.
• Present country practices and evidence on disposal from DMPA-SC self-injection studies or projects.
• Offer disposal options and considerations for contraceptive self-injection program design and planning.

Audience

• Country stakeholders and decision-makers developing DMPA-SC self-injection programs and plans.
Key points

• DMPA-SC self-injection offers benefits for women and health systems—household-level sharps disposal is one of many operational considerations for its introduction.

• Waste disposal should be part of design and planning of DMPA-SC self-injection programs.

• Efforts to strengthen waste management guidance, policies, and systems support DMPA-SC self-injection and other self-care programs.

• Where existing waste management systems are weak, guidance should be developed considering broader health system capacity.
  o Attention to or investments in household-level disposal could drive broader healthcare waste management system improvements.

• This area is still evolving.
  o Emerging DMPA-SC self-injection programs will provide important lessons to further inform appropriate, innovative solutions.
Self-injection can improve contraceptive access and choice

- Self-injection offers a new channel for delivering injectable contraception, including reaching first-time users.
- Research from low-resource settings shows that women, including those with limited education, are able to self-inject safely and effectively.
- Self-injection appears to improve contraceptive continuation.
- Self-injection can be cost-effective relative to DMPA-IM injections from providers.
- Self-injection is both convenient and empowering, giving women more control over their choice and use of family planning.
- Approximately 8 countries are currently planning for, or have already initiated, self-injection programs.

Appropriate disposal is an operational consideration for self-injection program design and planning

- Good health care waste management is part of infection control.
- Substantial guidance on sharps waste management is available for facility and community levels.
  - WHO recommends appropriate disposal of sharps at the site of use into a puncture-resistant container without recapping. No reuse or overfilling the container.\(^1\,^2\)
- Guidance specific to household-level sharps disposal is a gap in many countries.
  - Experience to date: DMPA-SC self-injectors tend to dispose of spent units similarly to other self-injectors (e.g. insulin users).
  - Community-level waste management guidance may offer good practices and evidence for household-level disposal.
  - Self-injection programs may provide an opportunity to strengthen household waste management practices.

Health care waste management resources

Facility and community levels


DMPA-SC self-injection waste disposal evidence
Self-injectors have disposed of used units in a number of ways

Containment and disposal in Ghana, Malawi, Senegal, Uganda

• Clients instructed to place used device in a puncture-proof container, then dispose of device in a latrine or return to a health worker.
  o Except for studies in Ghana and Uganda, women were not provided with a container; were instructed to use one from their household.
  o Containment and disposal instructions were not described in reports from DRC and Kenya.

Findings

• In studies where clients were instructed to contain the used device in a puncture-proof container before disposal, most did so.
  o In Senegal, containment of the used device in a puncture-proof container declined a bit in the course of three injections.
• In most study countries, disposal in a pit latrine was the most common final disposal method.
  o In both Senegal and Malawi, use of a pit latrine for disposal increased with subsequent injections.
• Some results may be influenced by the study design.
  o For instance, in Senegal, clients were visited by nurses for follow-up interviews, so they knew they could keep the used units to return to the study nurse.

Please see Annex for detailed study findings on how women disposed of used DMPA-SC devices.
Two disposal experiences from Uganda

PATH-MOH self-injection feasibility study (Cover et al., 2017)
• Advised women to store used DMPA-SC devices in a self-sourced, puncture-proof container, and dispose of them in a latrine or return to a health worker.
  o 71.5% of women reported storing used devices in a puncture-proof container before final disposal.
  o 93.8% of women disposed of used devices in a latrine as final disposal.

Key points
• Women like the latrine disposal method, but it is not viewed positively by national and subnational health systems leaders.
• Burning with household garbage was suggested by stakeholders, but it is not clear whether that is a sustainable option.
• Women seemed open to storing in a puncture-proof container and returning devices at their convenience to facilities, a community health worker, or drug shop for safe disposal.

• Provides women with low-cost puncture-proof lidded container and advises women to store used devices until they can return to a health worker or facility for safe disposal.
• Women are instructed to store used, uncapped devices in the container, then carefully transfer them to a health worker’s or facility’s sharps box so they can reuse the puncture-proof container.

→ Findings to come.
Available disposal guidance for self-injectors
US and UK examples of needle disposal guidance for self-injectors

Guidance key points

- Use of dedicated, puncture-resistant sharps containers.
- Disposal of sharps containers in designated areas or via community or national services, for example:
  - Drop-off collection sites
  - Hazardous waste centres
  - Residential special waste pickup services
  - Syringe exchange programs
  - Mail-back services
  - Home needle destruction devices

These options are a high standard based on injection safety best practices. They could serve as a model for household-level containment and drop-off, or containment and collection.
Guidance on household-level needle disposal practices: An informal survey of five countries

Informal survey conducted by the DMPA-SC Access Collaborative

- National diabetes and/or pharmaceutical associations
- Burkina Faso, Kenya, Madagascar, Senegal, and Uganda

Findings

- No standard guidelines or policies on management of used needles at household level, in any of the countries surveyed.
- Disposal suggestions depend on provider and context, and include:
  - Burn
  - Bury
  - Throw in pit latrine
  - Dispose (protected in a container) with general household waste
  - Store in a container and return to facility
Disposal considerations for DMPA-SC self-injection program planning
DMPA-SC could reduce waste management burden at facility and community levels, compared to DMPA-IM

DMPA-SC produces less waste than DMPA-IM, reducing cost and simplifying waste handling

- DMPA-SC produces 70% less waste by volume than DMPA-IM + SoloShot syringe.
- DMPA-SC takes up less space in safety boxes.
  - Requiring fewer safety boxes for the same number of injections.
  - Lowering costs associated with disposal supplies.
- No glass vial disposal challenges are associated with DMPA-SC.
- DMPA-SC reduces risk of environmental contamination since the Uniject device’s plastic reservoir can be incinerated.
Magnitude of waste from DMPA-SC self-injection is small in context of self-administered insulin

- Per WHO, household level or home treatment is a minor source of healthcare waste.
- At household level, the amount of DMPA-SC waste is minimal: a maximum of four units per year per user.¹
- Other self-administered injectable medicines, such as insulin, likely generate more sharps waste at household level.

Even in ambitious SI uptake scenarios, estimated needle waste from SI is less than self-administered insulin

Estimated annual sharps waste generated by insulin and DMPA-SC self-injectors: Example scenarios, Uganda 2018

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Insulin users: approx 136,000 individuals</th>
<th>DMPA-SC self-injectors: approx. 775,000 individuals</th>
<th>DMPA-SC self-injectors: approx. 150,000 individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best practice</strong></td>
<td>149,221,565</td>
<td>49,740,522</td>
<td>606,560</td>
</tr>
<tr>
<td><strong>Typical</strong></td>
<td>2,687,060</td>
<td>60,000,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td><strong>Aggressive</strong></td>
<td>49,740,522</td>
<td>150,000</td>
<td>300,000</td>
</tr>
<tr>
<td><strong>Growth</strong></td>
<td>606,560</td>
<td>1,000,000</td>
<td>200,000</td>
</tr>
</tbody>
</table>

**Needle waste scenarios**

- **Best practice**
  - No insulin needle reuse.³
  - Three used needles per insulin user per day.

- **Typical**
  - Insulin needles reused three times.
  - One used needle per insulin user per day.

- **Aggressive**
  - Half of all current DMPA clients (IM and SC) self-inject DMPA-SC.

- **Growth**
  - Half of current DMPA-SC clients self-inject.

**Assumptions and data sources**

- Estimates of diabetes prevalence and insulin use: WHO, research¹,²
- Uganda population estimates: United Nations
- Contraceptive prevalence rate and method mix: PMA2020 Uganda R6
- DMPA-SC self-injectors generate four used needles per year.

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² Manne-Goehler et al. Diabetes diagnosis and care in sub-Saharan Africa: pooled analysis of individual data from 12 countries. *Lancet Diabetes Endocrinol* (2016), [http://dx.doi.org/10.1016/S2213-8587(16)30181-4](http://dx.doi.org/10.1016/S2213-8587(16)30181-4)
Appropriate disposal should be part of self-injection program design and planning

• During initial rollout of DMPA-SC self-injection, countries may want to test different disposal options.
  o Feasible, realistic disposal options that maximize client convenience support adherence.

• Disposal options should:
  o Align with national healthcare waste management regulations and household-level guidance for self-administered medicines (where guidance exists).
  o Minimize risk of needlestick injuries and infection transmission.
  o Consider cost implications for both client and health system.
  o Consider scalability of practice.
  o Reflect growing evidence.
  o Be described in informative materials for clients and discussed by providers.

• Disposal should be addressed in program guidance, provider training, and client training.
## Countries should weigh disposal options for program guidance

<table>
<thead>
<tr>
<th>Disposal method</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
</table>
| Containment, then drop-off or collection for final disposal | - Puncture-proof container protects client and others from needlestick injuries  
- Senegal/Uganda analyses show self-injection can still be cost-effective if container provided  
- Shifts final disposal from household back to health system where practices are more established | - Can be inconvenient for client to return used devices  
- Client or health system must source an appropriate puncture-proof container  
- Drop-off or collection options all have cost implications for clients or health systems  
- Some needlestick risk transferring devices from containers to final disposal location (if guidance not followed)  
- Containers can add to waste volume |
| Burning                                              | - Common practice for household waste, especially in rural areas  
- Destroys biological hazard  
- Private (if the client is the trash burner) | - Temperature may not be high enough to fully destroy needle  
- Environmental concerns that have not been quantified (e.g., toxicity from burning plastic) |
| Burying                                              | - Many units can be buried  
- Removes from circulation | - Requires availability of land  
- May be accidentally excavated or exposed by runoff during rainy seasons  
- Labor intensive, especially to strictly follow guidelines  
- Environmental concerns that have not been quantified (e.g., plastic chemicals or residual drug in reservoir leach into soil) |
| Pit latrine (not composting toilet)                  | - Accessible in rural areas  
- Removes from circulation  
- Private | - Less available in urban areas  
- Environmental concerns that have not been quantified (e.g., plastic chemicals, needles in fecal sludge) |
| Household garbage                                    | - Urban households may have garbage collection services | - Questionable waste handling practices in many areas  
- Spent units and uncapped needles may end up in landfills accessible to people and animals |
### Annex: Ways DMPA-SC self-injectors disposed of used units

<table>
<thead>
<tr>
<th>Practice</th>
<th>Uganda feasibility</th>
<th>Uganda continuation</th>
<th>Senegal feasibility</th>
<th>Senegal continuation</th>
<th>DRC feasibility</th>
<th>Kenya feasibility</th>
<th>Malawi RCT</th>
<th>Ghana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stored used device in container until disposal</td>
<td>72%</td>
<td>2nd injection (78%)</td>
<td>49%</td>
<td>2nd injection (72%)</td>
<td>N/A</td>
<td>N/A</td>
<td>A few of those interviewed</td>
<td>2nd injection (99%) 3rd injection (98%)</td>
</tr>
<tr>
<td>Disposal in a pit latrine</td>
<td>93.8%</td>
<td>2nd injection (95%)</td>
<td>49%</td>
<td>4th injection (48%)</td>
<td>42%</td>
<td>74%</td>
<td>2nd injection (92%) 3rd injection (94%) 4th injection (99%)</td>
<td></td>
</tr>
<tr>
<td>Other disposal methods reported</td>
<td>Returned to clinic (3%)</td>
<td>Still have device injection 2 (3%)</td>
<td>Returned to clinic (11%)</td>
<td>Kept for study nurse (59%)</td>
<td>Trash can (52%)</td>
<td>Through health facility (19.2%)</td>
<td>Trash (&lt;1%)**</td>
<td>Burned (&lt;1%)**</td>
</tr>
<tr>
<td></td>
<td>Kept for study nurse (2%)</td>
<td>Kept for study nurse 3rd injection (2%)</td>
<td>Kept for study nurse (36%)</td>
<td>Kept for study nurse 2nd injection (46%)</td>
<td>Discarded outside (12%)</td>
<td>Compost pit (2.2%)</td>
<td>**Percentages represent 4th injection only. Data on other 2nd and 3rd injection practices are available in the articles – see References slide.</td>
<td></td>
</tr>
</tbody>
</table>
References


For more information:

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