Needle fear, pain and vaccines

Introduction to the CARD system as a framework for vaccination delivery

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Acknowledgements

Funding & support:

Hosting Partner:

Partners:
Vaccine hesitancy

Delay in acceptance or refusal of vaccines despite the availability of vaccination services

- complex and context specific, varying across time, place and vaccine
- influenced by such factors as confidence, convenience, and complacency

WHO, Ten threats to global health in 2019
The problem with needles

- Vaccines are the most common reason why people receive needles.
- Pain is the most common adverse event associated with immunization.
- 2/3 children and 1/4 adults are afraid of needles.
- Fear can fuel pain and lead to immunization stress-related responses (dizziness, headache, nausea, fainting).
- Negative vaccination experiences contribute to negative attitudes about vaccination and vaccine hesitancy.
- Up to 1 person in every 10 refuse vaccinations because of fear/pain.

Taddio et al. (2012); McMurtry et al. (2015); McMurtry (2020)

Selected icons made by Freepik from www.flaticon.com
Pain and fear exacerbate each other in an escalating relationship.
WHO 3C Model of Vaccine Hesitancy

Perceived risk is low, other priorities

Complacency

Confidence

Convenience

Trust in vaccines, their delivery and policy-makers

Structural and psychological

MacDonald (2015)
Mitigating pain is part of good immunization practices and should be embedded in national immunization policies and practices.

4. Advice for national programmes

Many immunization programmes have sustained high vaccine coverage levels without addressing pain during the vaccination procedure; however, mitigating pain at vaccination should be considered as part of good immunization practice globally.

National programmes should ensure that the recommendations listed above are implemented. At health system level, related health policy should be strengthened by provision of training on the recommended policies and practices. Programmes should recommend the preferred order of injection for country-specific vaccination schedules where possible.

Education of health-care workers on pain mitigation strategies, e.g. by inclusion in training curricula, needs to be ensured in order to facilitate their implementation. Additionally, it should be ensured that caregivers and, if appropriate, vaccine recipients, are educated on vaccination pain mitigation strategies. Information could be provided during prenatal visits, breastfeeding education, or at time of vaccination. Context-specific educational methods to be utilized should include teaching of individuals or groups, or provision of written information.
People's experiences of pain from a needle injection are the same because the pain stimulus is the same.

**Fiction:** Pain is an inherently subjective experience which is influenced by biological, psychological, and social factors and does **not** simply reflect the amount of tissue damage.
Fact or Fiction?

Client anxiety is the only factor that causes negative cycles of pain and fear related to needles.

**Fiction:** Biopsychosocial factors all contribute to influence a client's experience of needles over time. Social factors include behaviours by clinicians and parents.
In 2015, we created a Canadian clinical practice guideline (CPG) – it has been incorporated into the Canadian Immunization Guide and adopted by the World Health Organization.

The CPG includes evidence-based recommendations for reducing pain, fear and fainting. There are 5 domains of recommendations (5Ps):

- Procedural
- Physical
- Pharmacologic
- Psychological
- Process

Taddio, McMurtry et al. (2015)
Selected icons made by Freepik from www.flaticon.com
The 5 P’s include interventions that are designed to break the cycle of pain and fear

McMurtry et al. (2015)
Procedural

1. Injection method
   • no aspiration, fast injection

2. Order of injection
   • most painful last

3. Formulation
   • physiologic pH

Taddio, McMurtry et al. (2015)
Taddio et al. (2016)
Taddio et al (2010)
4. **Vastus lateralis injection** (infants)
   - In the middle of the space between the greater trochanter of the femur and the top of the knee

5. **Simultaneous injections** if multiple vaccines given (infants)
Physical

1. Breastfeeding
   • Between 0-2 years, if not breastfeeding, sweet-tasting solution & non-nutritive sucking

2. Positioning
   • Skin-to-skin contact in neonates
   • Holding in children up to 3 years
   • Sitting upright in children >3 years and adults

3. Tactile stimulation with cold
   (children and adolescents)
Pharmacological

1. Topical anesthetics
   - Lidocaine-prilocaine, amethocaine, liposomal lidocaine

2. Sweet-tasting solution (0-2 years)
   - Sucrose, glucose
   - Alternatively, oral rotavirus vaccine first (2 to 4 months)

3. Vapocoolants (adults)
   - PainEase, Ethyl Chloride

Taddio, McMurtry et al. (2015) 15
Psychological

1. Interactions
   - Words and actions can promote coping or increase distress
   - Use coping-promoting behaviours

2. Distraction
   - Take attention away from needle

Taddio, McMurtry et al. (2015)
High levels of needle fear

Exposure therapy

• Facing fears gradually over time to overcome needle fear

Typically requires assistance by a trained provider

<table>
<thead>
<tr>
<th>Step</th>
<th>Situation</th>
<th>Fear Rating (0-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Getting a shot in the upper arm or fleshy part of leg</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>Slightly pricking one’s skin with a needle</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Watching someone else get a needle</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>Resting needle against vein</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Resting the needle against one’s skin</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Rubbing an alcohol swab against one’s skin</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Holding a needle</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Watching an apple being injected</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Watching video clips of someone getting a needle</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Looking at a picture of a needle</td>
<td>2</td>
</tr>
</tbody>
</table>

Taddio, McMurtry et al. (2015)
McMurtry, Taddio et al. (2016)
Fainting or syncope during injection

Use muscle tension to raise blood pressure and help prevent fainting

If a patient feels dizzy during injection, they can do the following before, during, and after the injection:

• Squeeze or tense their leg and stomach muscles 10 to 15 seconds or until feeling flushed or warm in their face
• Release tension for 20 to 30 seconds
• Repeat in cycles until the symptoms disappear
Good practice recommendations

- Minimize fear-inducing stimuli
- Minimize waiting time
- Provide privacy and comfort
- Be observant and responsive

Taddio, McMurtry et al. (2015)
Gold et al. (2020)
McMurtry (2020)
Process

• Provider education
• Caregiver/parent education
• Individual education
The CARD framework

• Targets all stakeholders involved in vaccination.

• Translates the 5P’s of pain management into a user-friendly tool.

• Each stakeholder can ‘play their CARDS’ to improve the vaccination experience.
CARD 3E Model

Person-centred care

Environment

- Seating available (everyone)
- Space for support person
- Privacy
- Distractions
- Minimize fear cues

Engagement

- Health care providers
- Parents/caregivers
- Individuals/children

- Ahead of time (booking)
- On vaccination day

- Be calm, positive, promote coping
- Assess symptoms (fear, pain, fainting)
- Invite participation, answer questions
- Support CARD (coping) choices
- Minimize injection pain, fear

Education

- Health care providers
- Parents/caregivers
- Individuals/children

- Ahead of time (booking)
- On vaccination day
Summary of how CARD fits

**Preparation/Planning**

1. **Education – programs, providers**
   - Embed in policies/procedures
   - Integrate in staff training
   - Tools/resources (e.g., factsheets, checklists)

2. **Clinic space, set-up, flow – providers**
   - Visually appealing
   - Separate area before, during, afterward
   - Arrange seating so patients not facing others
   - Allow for privacy and provide seating
   - Accommodate support person with seating

3. **Education – individuals, caregivers**
   - Factsheets, videos, games
   - Access to individuals ahead of time (booking)

4. **Reminders – individuals**
   - Vaccination date, clinic processes, CARD
   - Planning for coping items, accommodations

**Vaccination Day**

5. **Clinic set-up, flow – providers**
   - Minimize cues of fear (visual, sound)
   - Signage, CARD
   - Distractions before, during, afterward
   - Most fearful first (expectations for timing/ability to return if unvaccinated)
   - Avoid interruptions

6. **Interactions – providers, individuals**
   - Be calm and attentive; use coping-promoting language
   - Assess symptoms (pain, fear, related reactions)
   - Invite participation, answer questions
   - Support patient CARD (coping) choices
   - Use injection techniques that minimize pain, fear

Icons made by Freepik from www.flaticon.com
CARD improves:

- Attitudes
- Knowledge
- Safety
- Experiences

Taddio et al. (2019)
Taddio et al. (2022)
Tetui et al. (2022)
Taddio et al. (2022)
# Studies with CARD

<table>
<thead>
<tr>
<th>Study</th>
<th>Target</th>
<th>Setting</th>
<th>Design</th>
<th>Sample size</th>
<th>Impact</th>
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</thead>
<tbody>
<tr>
<td>Freedman et al.</td>
<td>Providers, children 12 years, parents, educators</td>
<td>Schools</td>
<td>Controlled Clinical Trial</td>
<td>323</td>
<td>↓ fear, dizziness</td>
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<tr>
<td>(2019)</td>
<td></td>
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<tr>
<td>Taddio et al.</td>
<td>Providers, children 12 years, parents, educators</td>
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<td>Randomized Controlled Trial</td>
<td>1919</td>
<td>↓ fear, pain, fainting</td>
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<tr>
<td>(2022)</td>
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<tr>
<td>Tetui et al.</td>
<td>Providers, patients &gt;12 years</td>
<td>Mass vaccination clinics</td>
<td>Before and After Trial</td>
<td>2488</td>
<td>↓ fear, pain, dizziness</td>
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<tr>
<td>(2022)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taddio et al.</td>
<td>Providers, parents, children 5-11 years</td>
<td>Pharmacies</td>
<td>Before and After Trial</td>
<td>153</td>
<td>↓ fear</td>
</tr>
<tr>
<td>(2022)</td>
<td></td>
<td></td>
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</tbody>
</table>
Feedback about CARD

We were able to make it an enjoyable experience.

Everything was just a little more strategic. It’s just building on the skills we already have.

Asking about fear showed you cared, right to the very end.

I love my job and this made it better.

They have a coping strategy. It’s not just about pain, fear, but everyday life.

It made a big difference. I don’t know why you would go back.

Kids were prepared, confident, and empowered!
CARD in action

The CARD system is not only about needles and needle pain. It’s also about teaching ways to cope with other stressors.

With CARD…
• Everyone is prepared
• Clinics are less chaotic
• Patients experience less pain, fear and dizziness

Help patients play their own CARDs:
• Coach them using the CARD framework before, during and after vaccination
• Try opening the conversation by asking them what CARDs they want to play and support them in their choices
• Chart the patient’s CARD preferences and response to the vaccination so as to inform possible approaches for future vaccinations or other needle procedures.

https://youtu.be/FXj6ELi4BVg
WHO 3C Model of Vaccine Hesitancy

- **Complacency**
  - Perceived Risk is low; other priorities

- **Confidence**
  - Trust in vaccines, their delivery, policy-makers

- **Convenience**

**The CARD™ System**

Structural and psychological

MacDonald (2015)
Self-reflection activity

Have you ever met a client who was afraid of needles?

• What happened?
• What did you do?
• How well did it work?

Thinking back on what you learned about the CARD framework, what might you do differently?
Fear / Pain

Play your CARDS!
Resources

• Aboutkidshealth (SickKids): [www.cardsystem.ca](http://www.cardsystem.ca)
• Immunize Canada: [CARD resources](http://example.com)
  • New: [CARD Game for Kids](http://example.com) (mobile web game)
• HELPinKids&Adults (University of Toronto) and resources
• Pediatric Pain, Health and Communication Lab and resources
• Government of Canada: [Vaccination pain management for children: Guidance for health care providers](http://example.com)
• Government of Canada: [Vaccination pain management for adults: Guidance for health care providers](http://example.com)
• Canadian Paediatric Society's [statement on COVID-19 vaccinations](http://example.com)
• World Health Organization 2015 guideline on pain mitigation during vaccination
• Immunization stress-related responses: [full manual], [synopsis], [summary for clinicians]
For more PHAC webinars and videos on COVID-19, visit:

- COVID-19 for health professionals: Training

- National Collaborating Centre for Infectious diseases
  [nccid.ca/phac-webinars-on-covid-19-vaccines](http://nccid.ca/phac-webinars-on-covid-19-vaccines)

- Canadian Vaccination Evidence Resource and Exchange Centre
  [www.canvax.ca/canvax-webinar-series](http://www.canvax.ca/canvax-webinar-series)
THANK YOU FOR JOINING US!

Copies of the presentation and video will be made available on canvax.ca