

Needle fear, pain and vaccines

Introduction to the CARD system as a framework for vaccination delivery



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Anxiety
CANADA

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Vaccine hesitancy



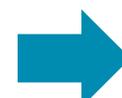
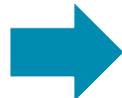
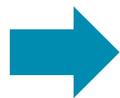
Delay in acceptance or refusal of vaccines despite the availability of vaccination services

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

The problem with needles



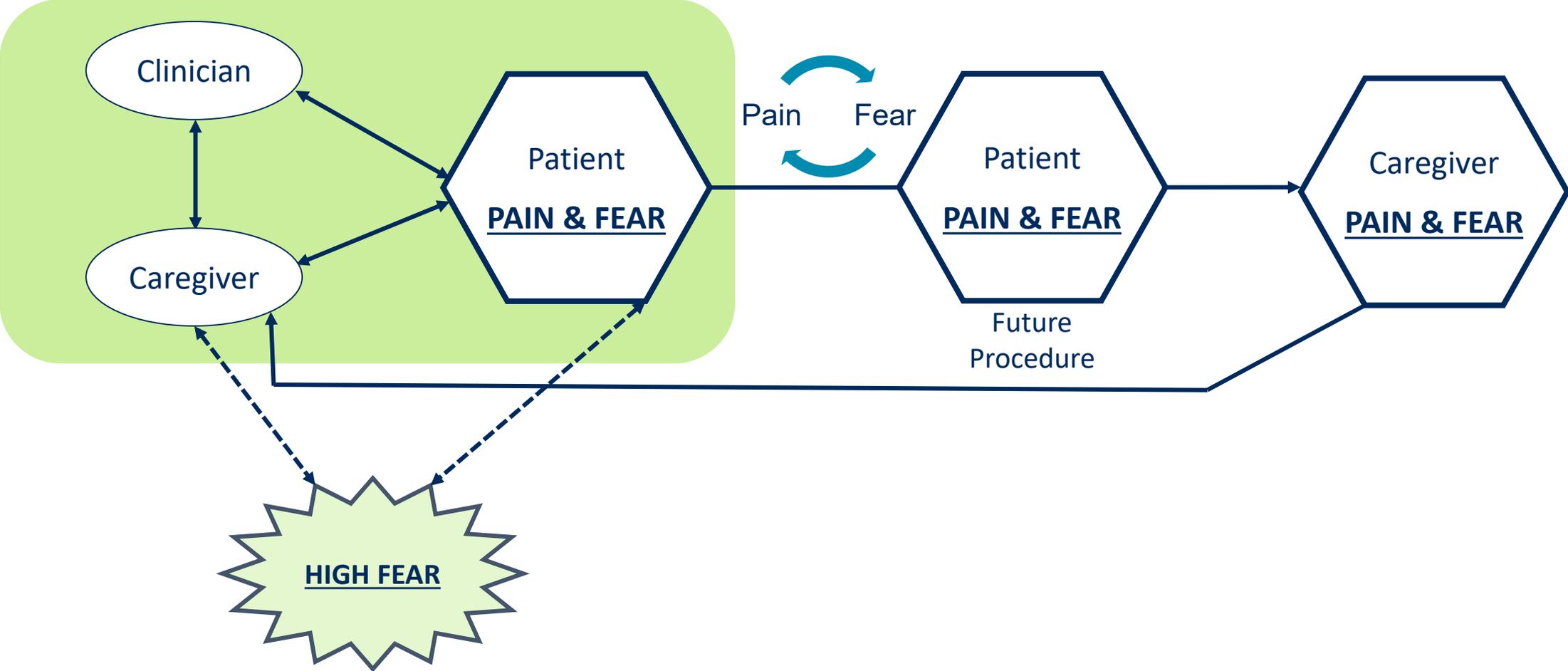
- Vaccines are the most common reason why people receive needles.
- Pain is the most common adverse event associated with immunization.
- 2/3 children and 1/4 adults are afraid of needles.
- Fear can fuel pain and lead to immunization stress-related responses (dizziness, headache, nausea, fainting).
- 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

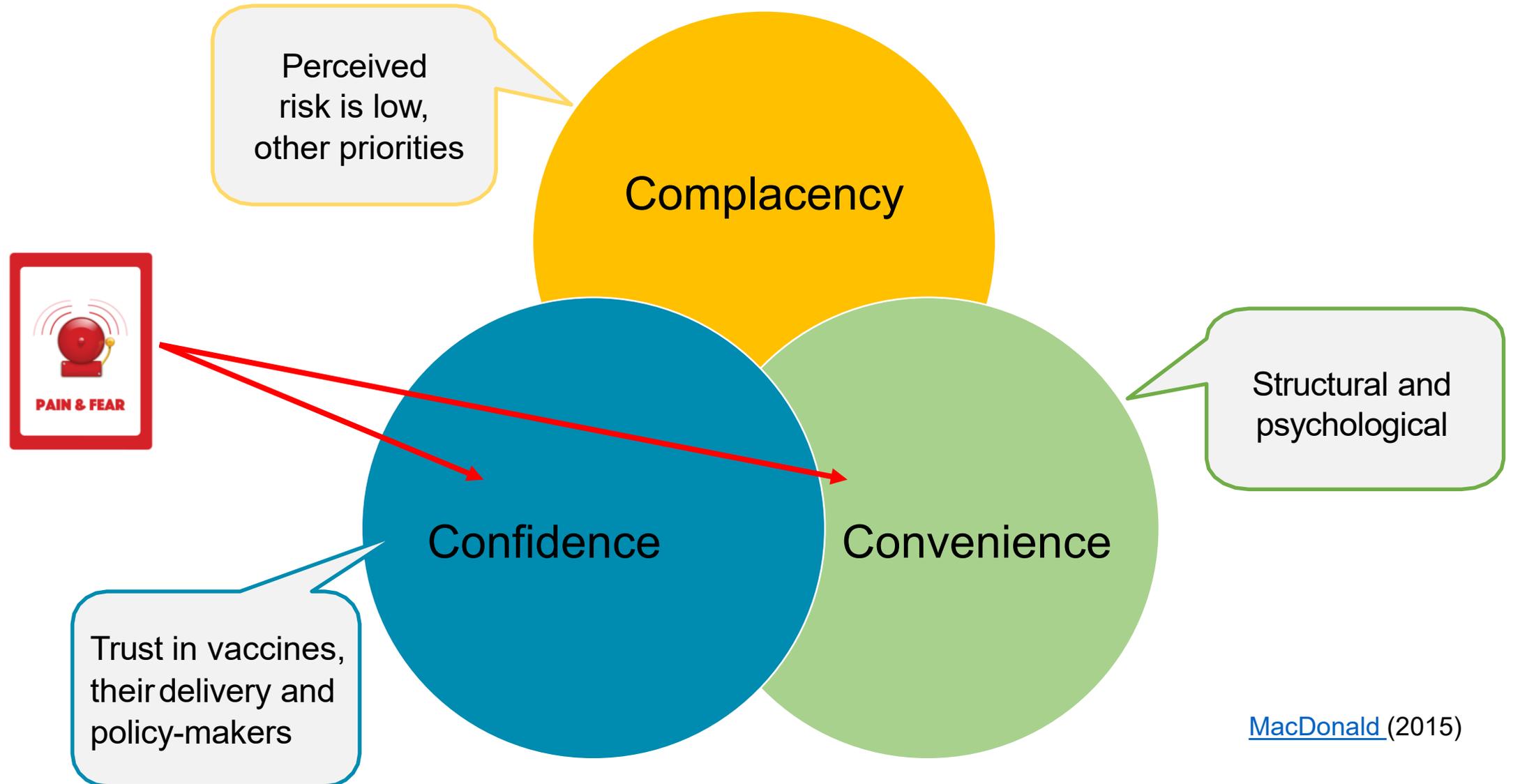
Pain and fear exacerbate each other in an escalating relationship



Development over time

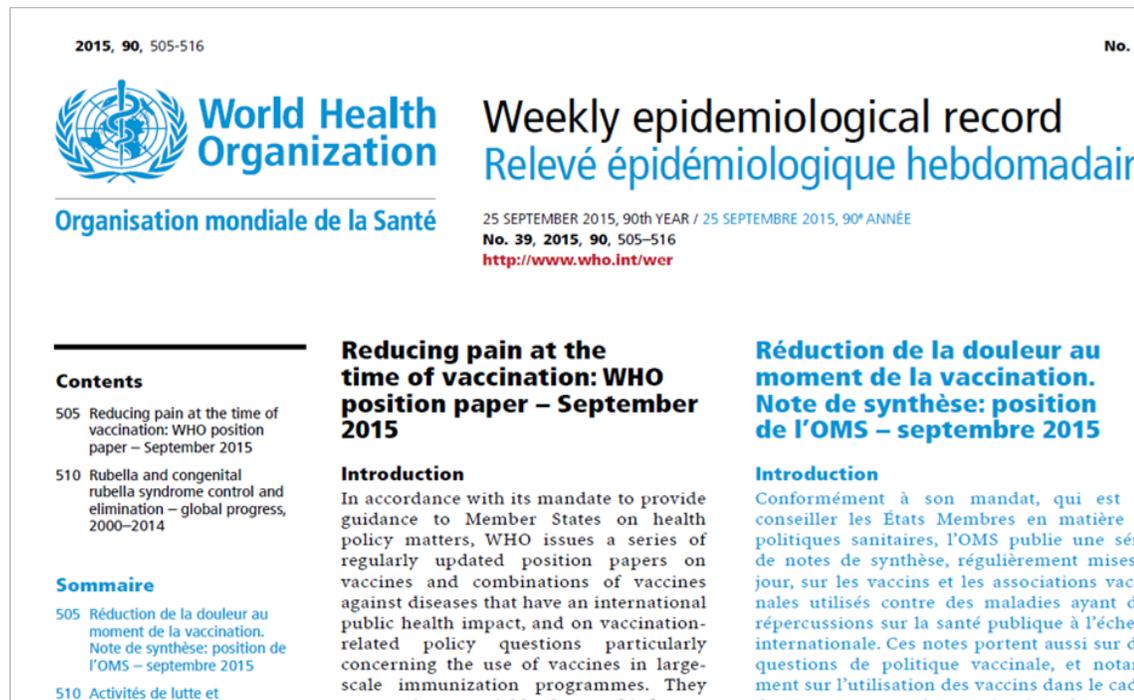


WHO 3C Model of Vaccine Hesitancy



[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.

Fact or Fiction?

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.



The Evidence



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

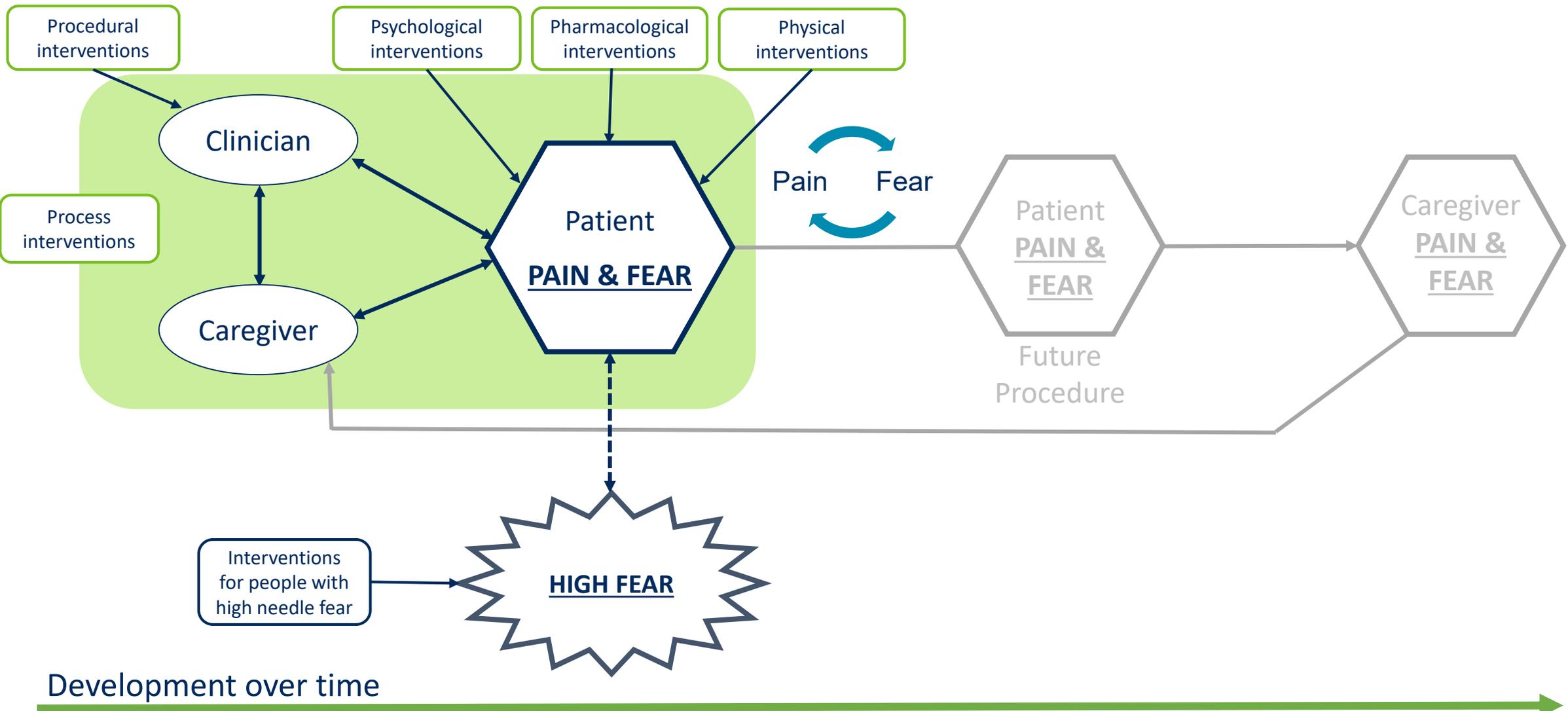


Process

[Taddio , McMurtry et al. \(2015\)](#)

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The 5 P's include interventions that are designed to break the cycle of pain and fear



Development over time

Procedural

1. Injection method

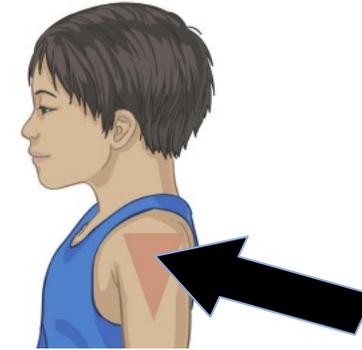
- no aspiration, fast injection

2. Order of injection

- most painful last

3. Formulation

- physiologic pH



[Taddio , McMurtry et al. \(2015\)](#)

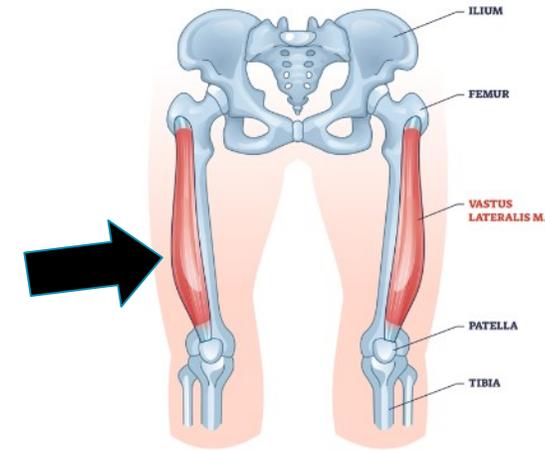
[Taddio et al.\(2016\)](#)

[Taddio et al \(2010\)](#)

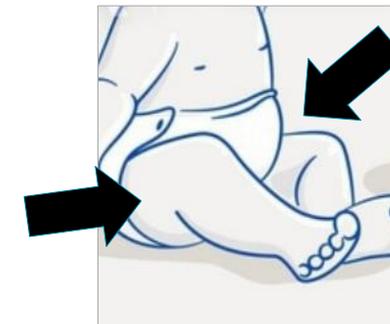
Procedural

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



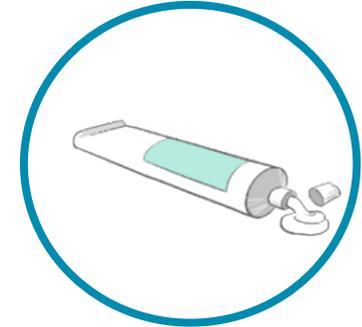
3. Tactile stimulation with cold (children and adolescents)



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



Psychological

1. Interactions

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

2. Distraction

- Take attention away from needle



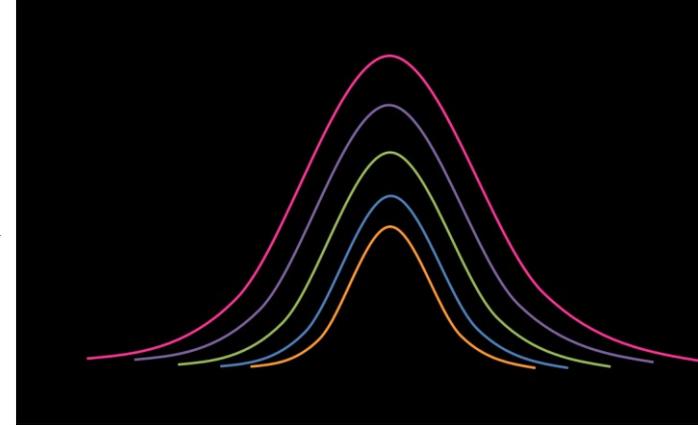
[Taddio , McMurtry et al. \(2015\)](#)

High levels of needle fear

Exposure therapy

- Facing fears gradually over time to overcome needle fear

Typically requires assistance by a trained provider



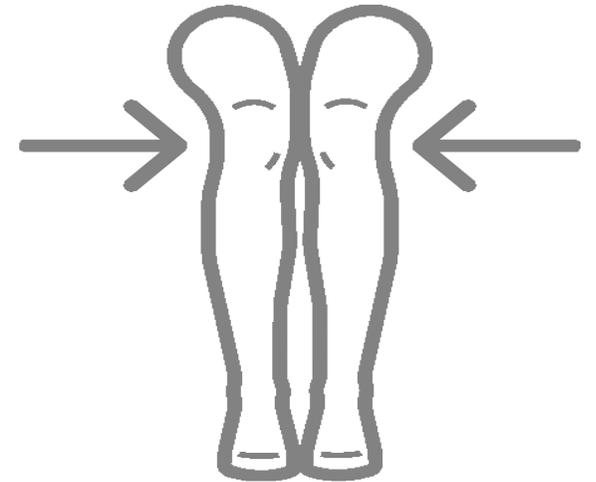
Step	Situation	Fear Rating (0-10)
10.	Getting a shot in the upper arm or fleshy part of leg	10
9.	Slightly pricking one's skin with a needle	9
8.	Watching someone else get a needle	8
7.	Resting needle against vein	7
6.	Resting the needle against one's skin	7
5.	Rubbing an alcohol swab against one's skin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

Fainting or syncope during injection

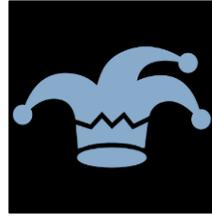
Use muscle tension to raise blood pressure and help prevent fainting

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

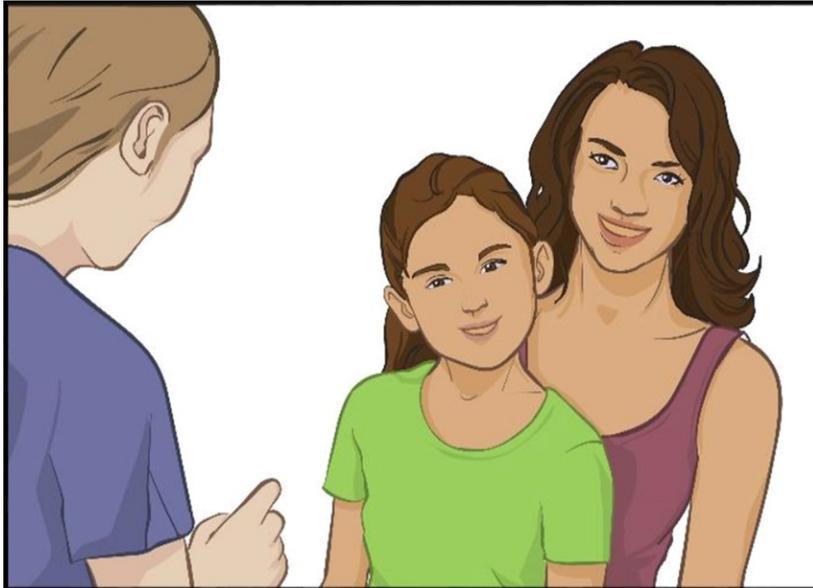


Provide privacy and comfort



Be observant and responsive

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.

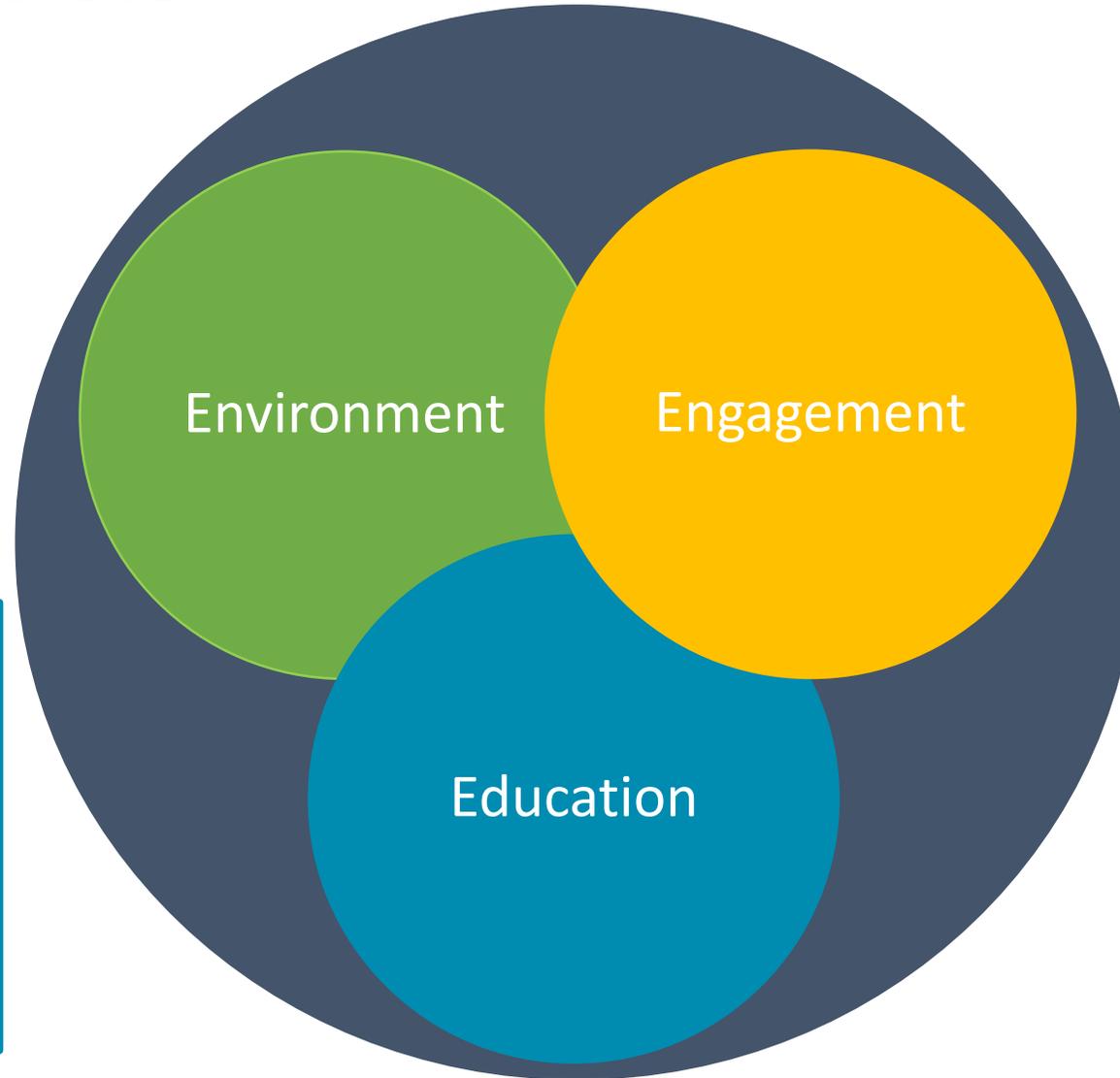


C – Comfort
A – Ask
R – Relax
D – Distract

CARD 3E Model

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

- 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

Person-centred care

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



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

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

Study	Target	Setting	Design	Sample size	Impact
Freedman et al. (2019)	Providers, children 12 years, parents, educators	Schools	Controlled Clinical Trial	323	↓ fear, dizziness
Taddio et al. (2022)	Providers, children 12 years, parents, educators	Schools	Randomized Controlled Trial	1919	↓ fear, pain, fainting
Tetui et al. (2022)	Providers, patients ≥ 12 years	Mass vaccination clinics	Before and After Trial	2488	↓ fear, pain, dizziness
Taddio et al. (2022)	Providers, parents, children 5-11 years	Pharmacies	Before and After Trial	153	↓ fear

Feedback about CARD

We were able to make it an enjoyable experience.

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

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

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



I love my job and this made it better.

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

Kids were prepared, confident, and empowered!

CARD in action

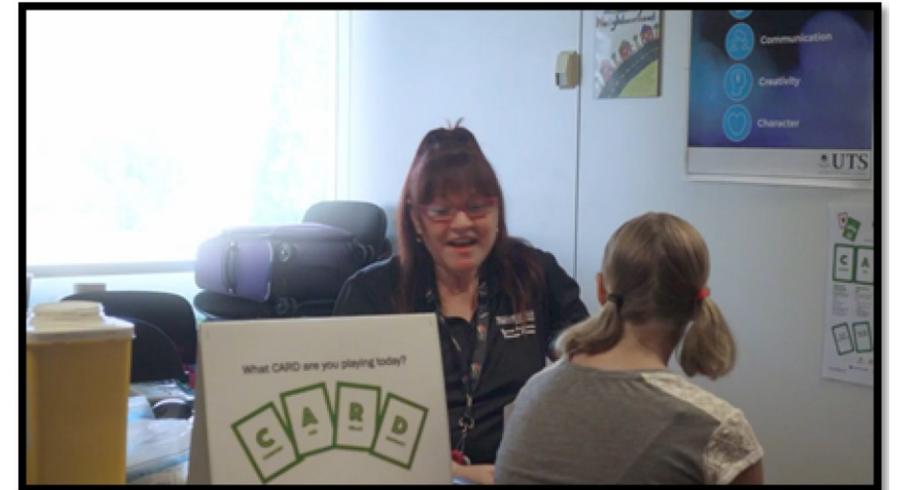
The CARD system is not only about needles and needle pain. It's also about teaching ways to cope with other stressors.

With CARD...

- Everyone is prepared
- Clinics are less chaotic
- Patients experience less pain, fear and dizziness

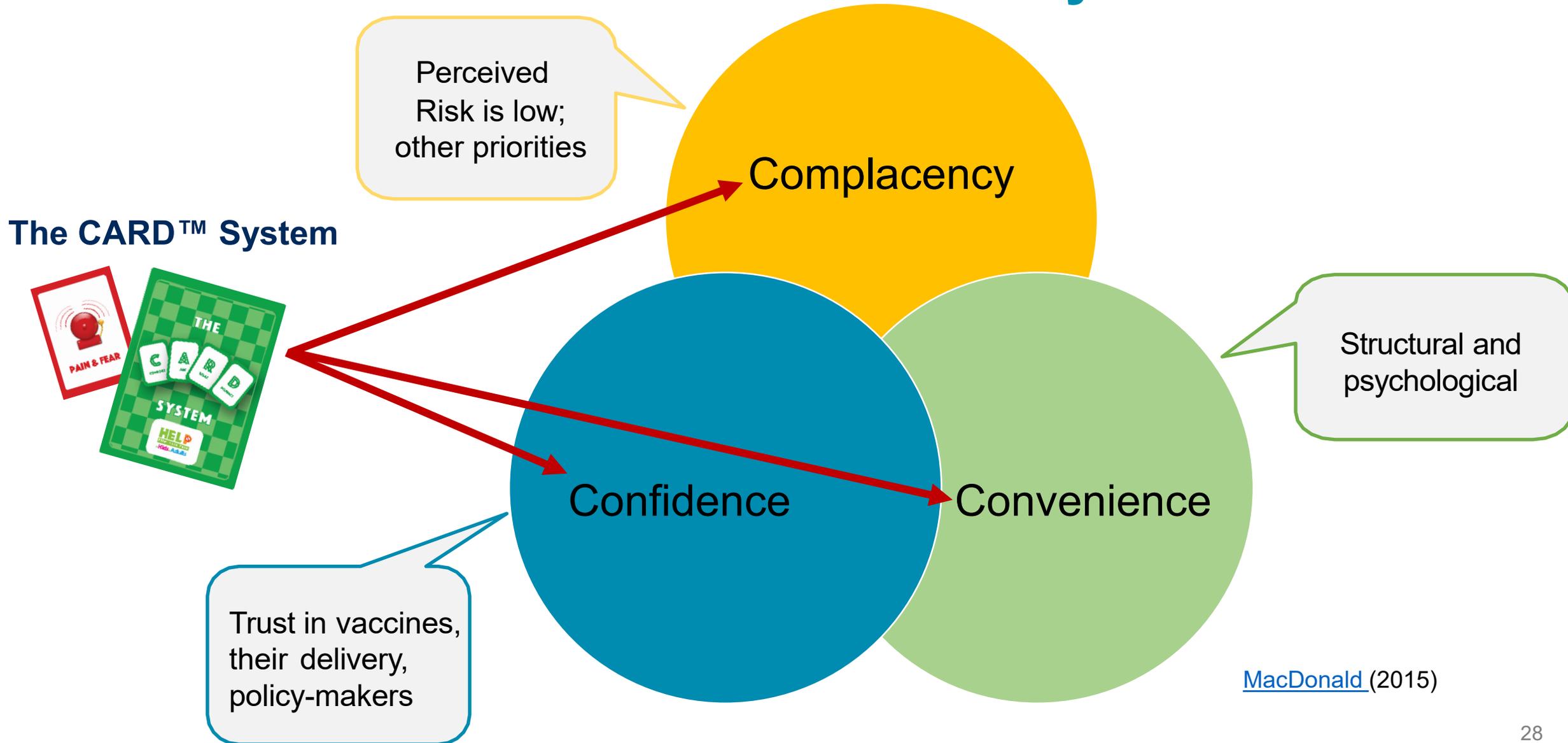
Help patients play their own CARDS:

- 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



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?

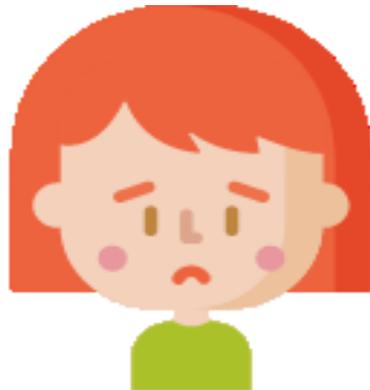
Thinking back on what you learned about the **CARD framework, what might you do differently?**



Fear / Pain



Play your
CARDS!



Resources

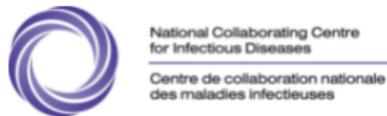
- Aboutkidshealth (SickKids): www.cardsystem.ca
- Immunize Canada: [CARD resources](#)
 - *New:* [CARD Game for Kids](#) (mobile web game)
- [HELPinKids&Adults \(University of Toronto\) and resources](#)
- [Pediatric Pain, Health and Communication Lab](#) and [resources](#)
- Government of Canada: [Vaccination pain management for **children**: Guidance for health care providers](#)
- Government of Canada: [Vaccination pain management for **adults**: Guidance for health care providers](#)
- Canadian Paediatric Society's [statement on COVID-19 vaccinations](#)
- [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

www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/training.html



National Collaborating Centre for Infectious diseases

nccid.ca/phac-webinars-on-covid-19-vaccines



Canadian Vaccination Evidence Resource and Exchange Centre

www.canvax.ca/canvax-webinar-series



THANK YOU FOR JOINING US!

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