



UNIVERSITY OF TORONTO
LESLIE DAN FACULTY OF PHARMACY

Needle Poke Pain: How to *play your best hand*



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SickKids®

Declarations

Land acknowledgement:

The University of Toronto acknowledges that the land on which it operates has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit.



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Funding & support:



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AboutKidsHealth.ca



Learning objectives

1. Identify the consequences of poorly managed needle pain
2. Describe evidence-based strategies to reduce needle pain
3. Apply evidence-based strategies to reduce needle pain

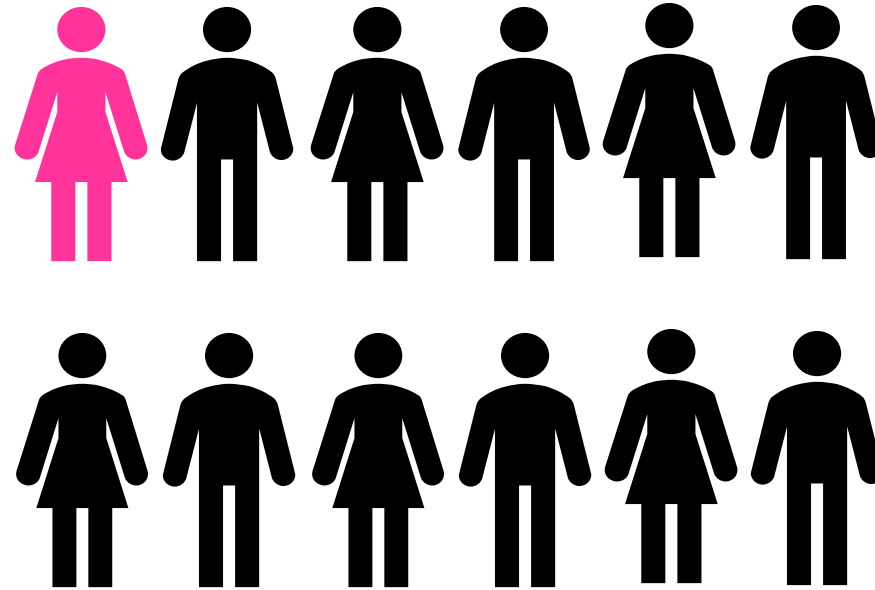
1. Consequences of needle pain

- Needles are ubiquitous in health care: vaccinations are the most common needle procedure
- Pain is the most common adverse event following needle procedures
- 2/3 children and 1/4 adults are afraid of needles
- Fear can fuel pain and lead to other stress-related responses (dizziness, headache, nausea, fainting)
- Negative experiences contribute to non-compliance with needle procedures



Non-compliance with childhood vaccination - systematic review

1 out of 12 people have refused
vaccination due to needle fear



Taddio, et al., Vaccine 2022

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**

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.



2. Evidence for reducing needle pain



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

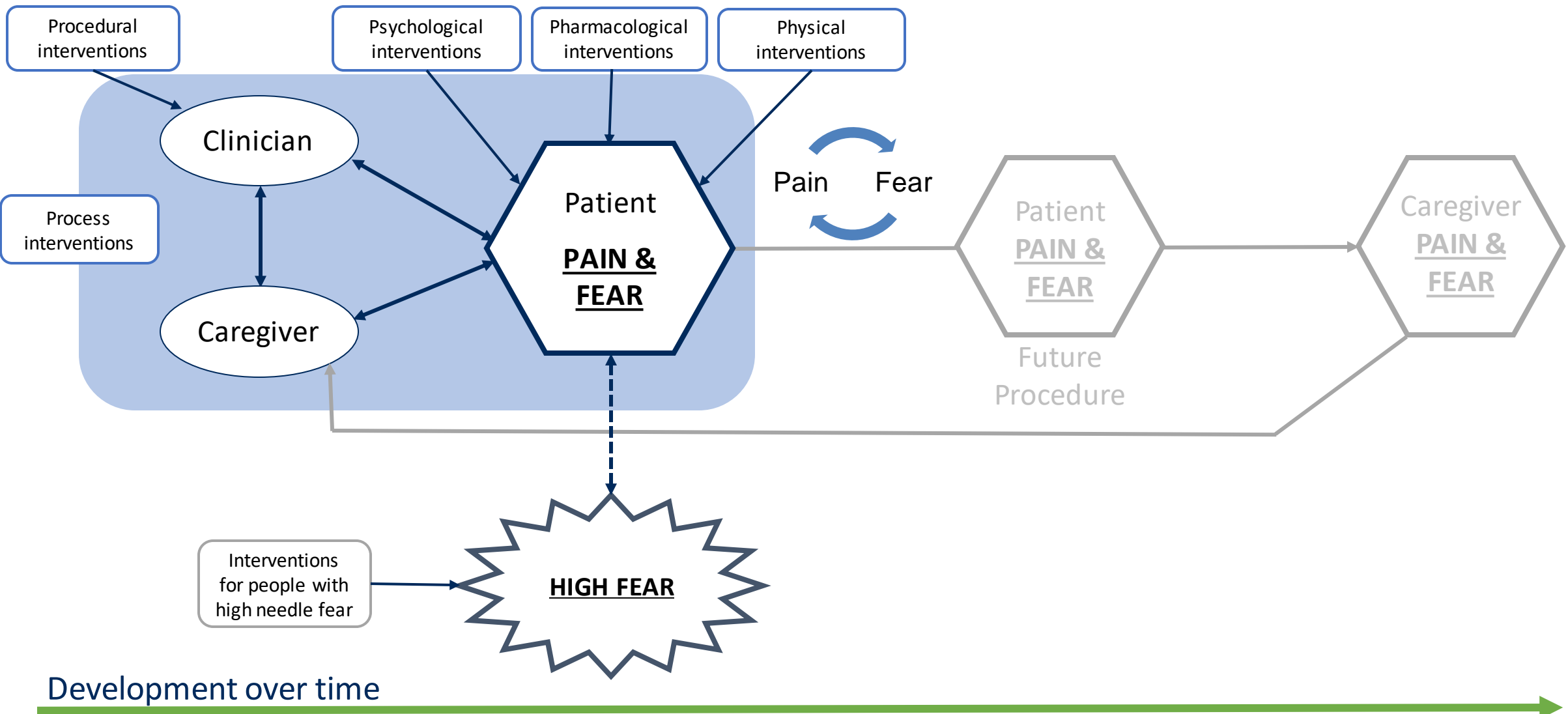


Process

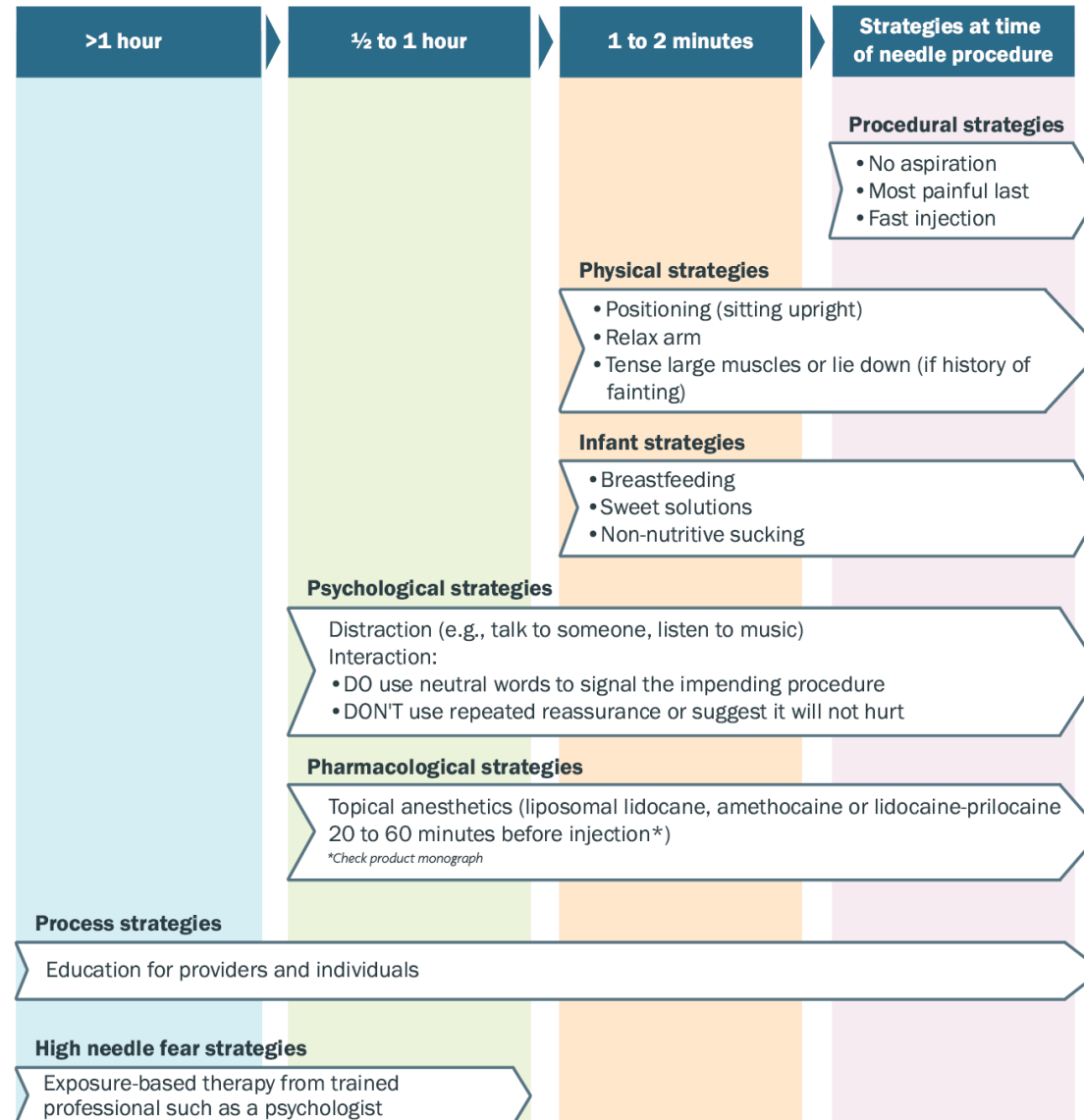
[Taddio, McMurtry et al. \(2015\)](#)

Selected icons made by [Freepik](#) from www.flaticon.com

The 5 P's target the cycle of pain and fear



Algorithm of the research



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 \(2020\)](#)

'Uptake' of Clinical Practice Guideline (CPG)



Courtesy of Immunize Canada, 2021

BCCDC:

http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%202%20-%20Imms/Appendix_D_RIIP.pdf

AHS:

<https://www.albertahealthservices.ca/assets/info/hp/cdc/if-hp-cdc-ipism-standard-administration-immunization-06-100.pdf>

Manitoba, Winnipeg Regional Health Authority:

<https://professionals.wrha.mb.ca/old/professionals/immunization/contents.php>

Ontario:

https://www.health.gov.on.ca/en/common/ministry/publications/reports/immunization_2020/immunization_2020_report.pdf

Quebec:

<https://www.msss.gouv.qc.ca/professionnels/vaccination/protocole-d-immunisation-du-quebec-piq/>

Nova Scotia:

<https://novascotia.ca/dhw/cdpc/documents/Immunization-Manual.pdf>

New Brunswick:

https://www2.gnb.ca/content/gnb/en/departments/ocmoh/for_healthprofessionals/cdc/NBImmunizationGuide.html

Newfoundland:

<https://www.gov.nl.ca/hcs/files/publichealth-cdc-im-section4.pdf>

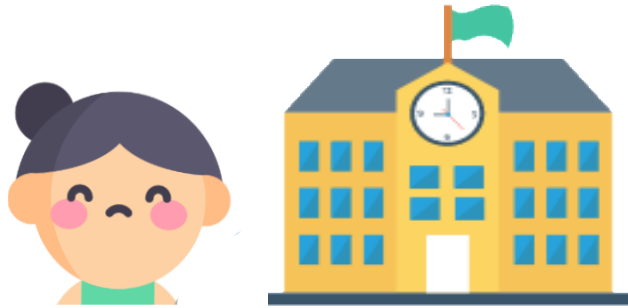
Nunavut:

https://www.gov.nu.ca/sites/default/files/immunization_manual.pdf

Yukon (part of immunization competencies):

https://yukon.ca/sites/yukon.ca/files/section_1_-_yukon_immunization_competencies_2021_final_july_2021.pdf

Practice review Clinical Care Gaps



NATIONAL PERSPECTIVE, 2017

Fear is worst part of vaccination	59%
Pain is worst part of vaccination	35%
Know how to reduce pain/fear	50%
Prepared ahead of time	17%



ONTARIO PUBLIC HEALTH UNITS, 2021

Policies on pain/fear	58%
Formal training on program delivery	74%
Formal training on pain/fear	50%
Incorporate coping preferences	30%
Document stress-related responses*	0%

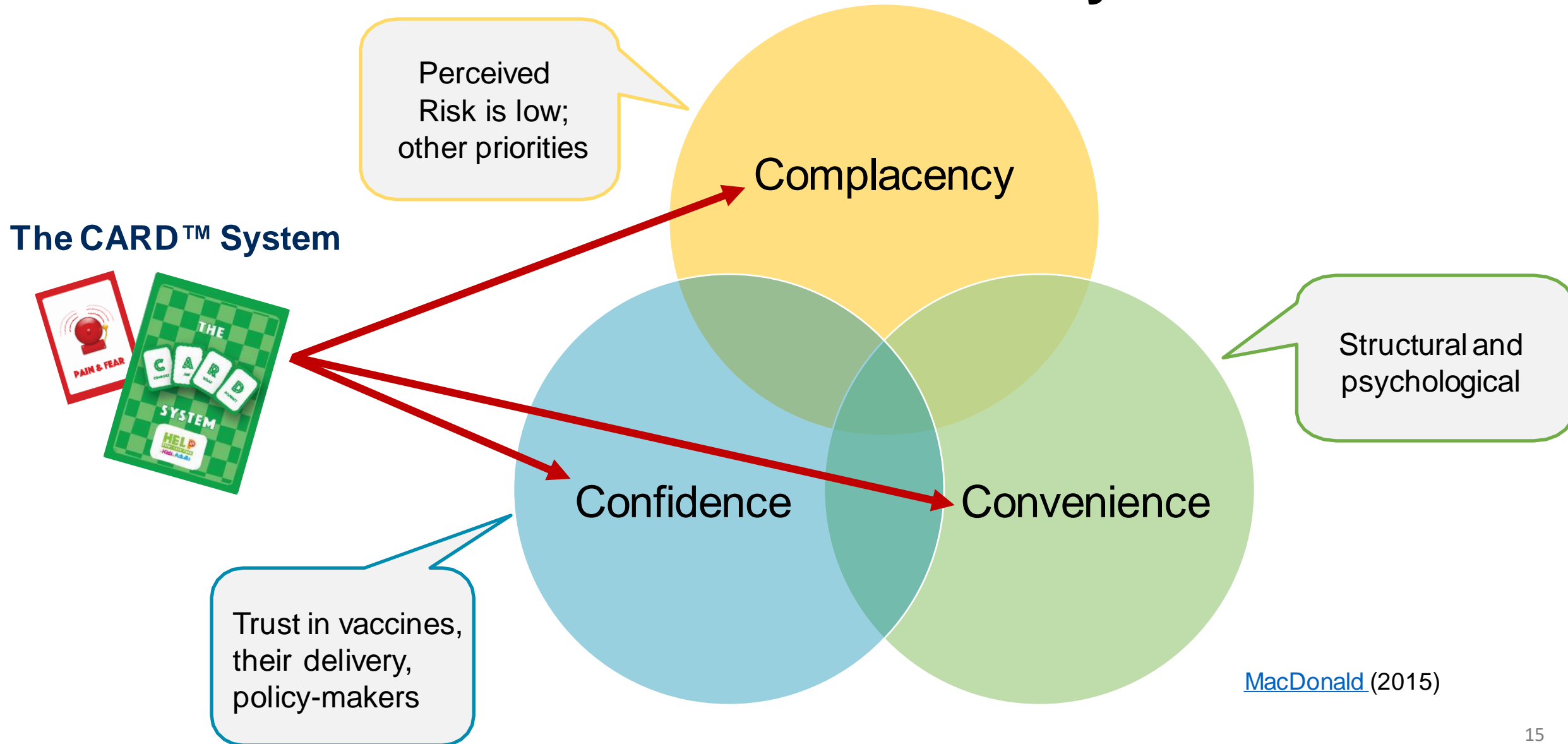
* Pain/fear/dizziness; Fainting monitored in 83%

3. The CARD framework



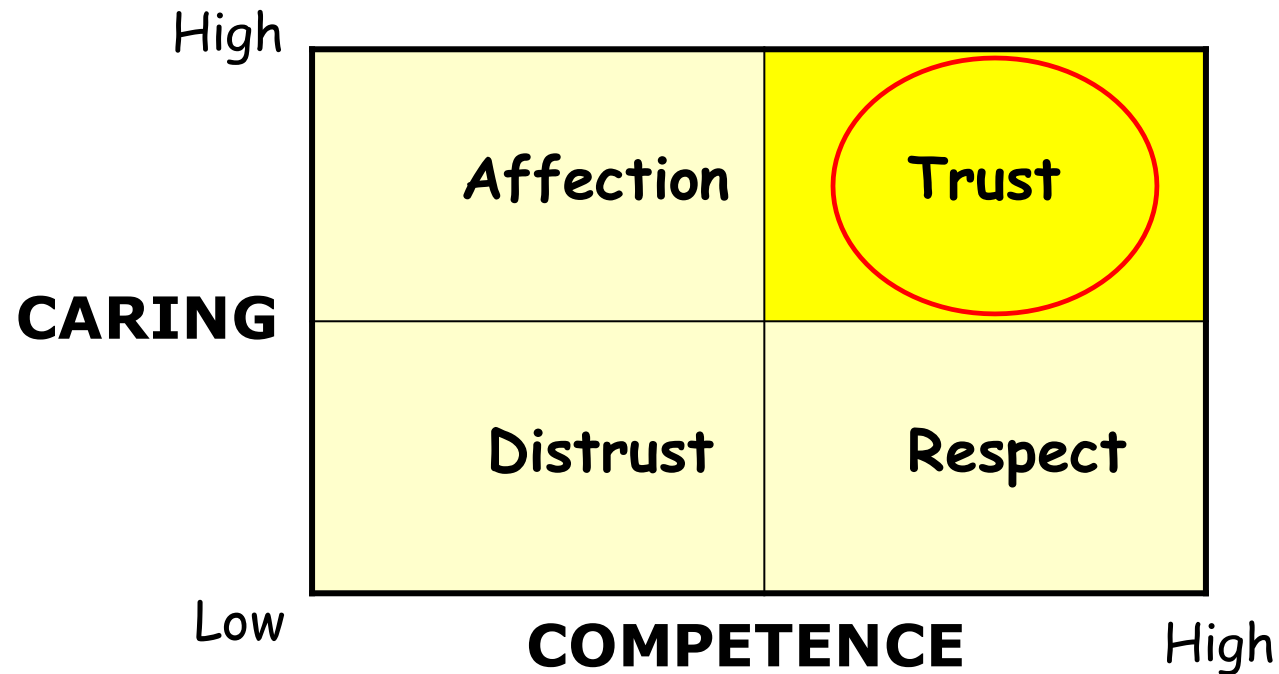
- ‘Systems level’ approach to address the identified clinical care gap
 - Targets all groups involved (patients and providers)
- Turns the evidence into ‘action’ and uses a user-friendly and intuitive tool
 - Each group *“plays their CARDS”*
- Interventions implemented “ahead of time” and “on needle procedure day”

WHO 3C Model of Vaccine Hesitancy



Satisfaction and Trust

Promotion of Trust = Competence + Caring



Paling J. BMJ 2003; 327-745

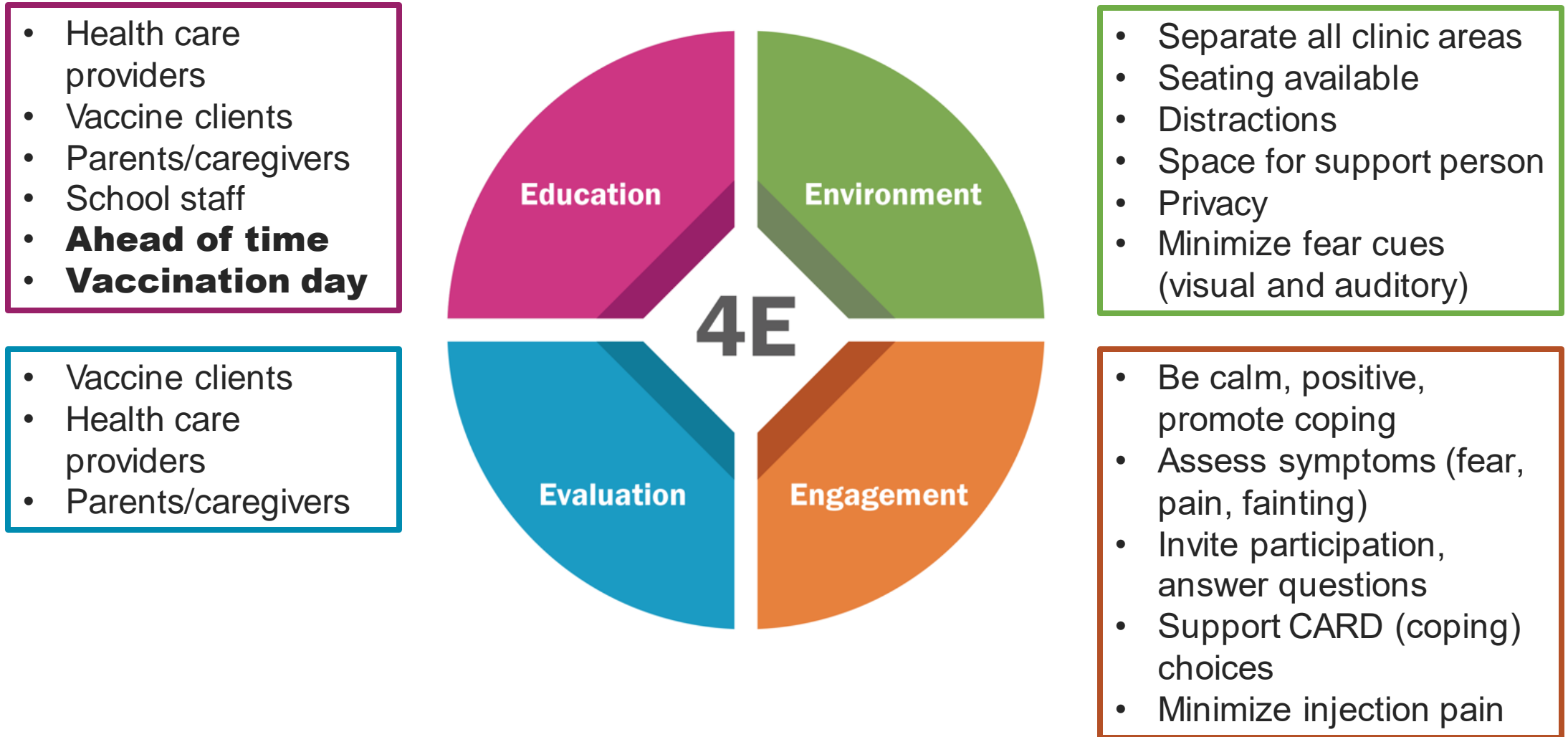
Quality Care

Alignment with Models of Care Delivery

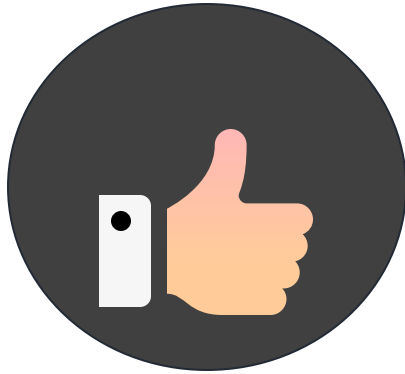


Person-centred care
Sharma, 2015

How CARD works – The 4E Model



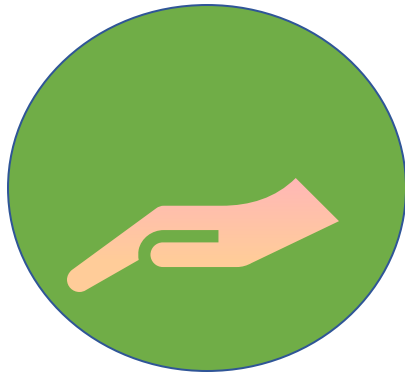
CARD improves:



Attitudes



Knowledge



Safety



Experiences

[Taddio et al. \(2019\)](#)
[Taddio et al. \(2022\)](#)
[Tetui et al. \(2022\)](#)
Taddio et al. (2022)

Studies with CARD in the vaccination context

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	Community pharmacies	Before and After Trial	153	↓ fear, pain
Taddio et al. (2023)	Providers, parents, children 12-14 years	Schools (urban)	Randomized Controlled Trial	8839	↓ fear
Gudzak et al. (in prep'n)	Providers, adults ≥ 18 years	University vaccination pop-up clinics	Before and After Trial	476	↓ fear, pain

Case

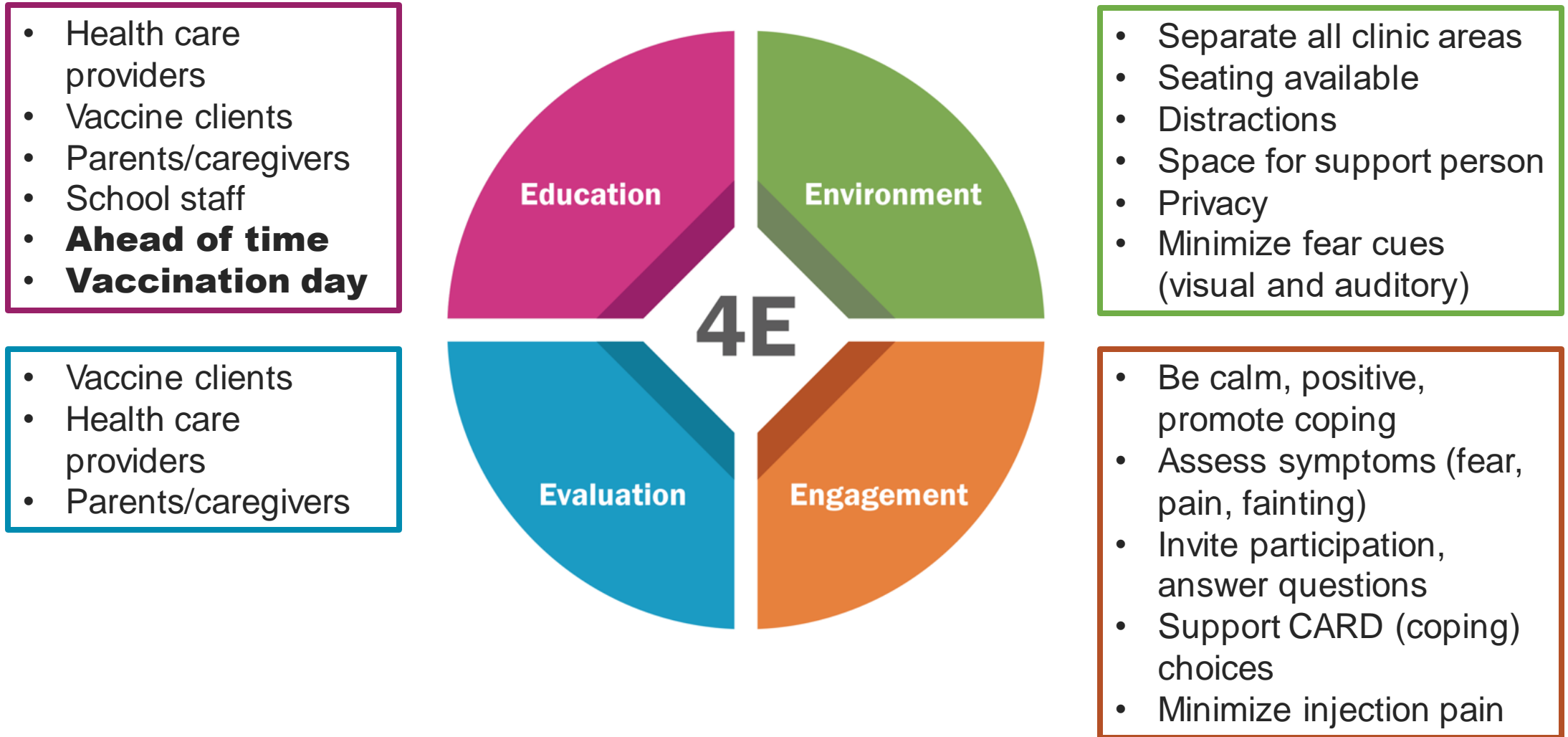
Sarah is 6 years old.



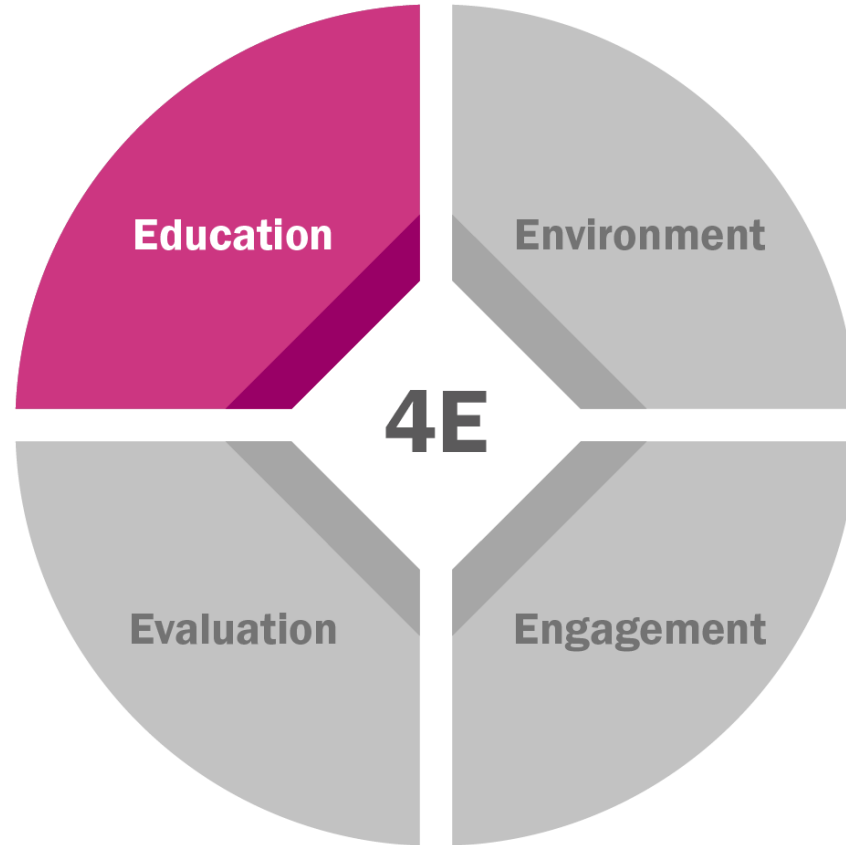
She is not vaccinated against COVID-19. She is very afraid of needles. The last time she got a needle, her dad held her down. It was very stressful for everyone.

What do you recommend?

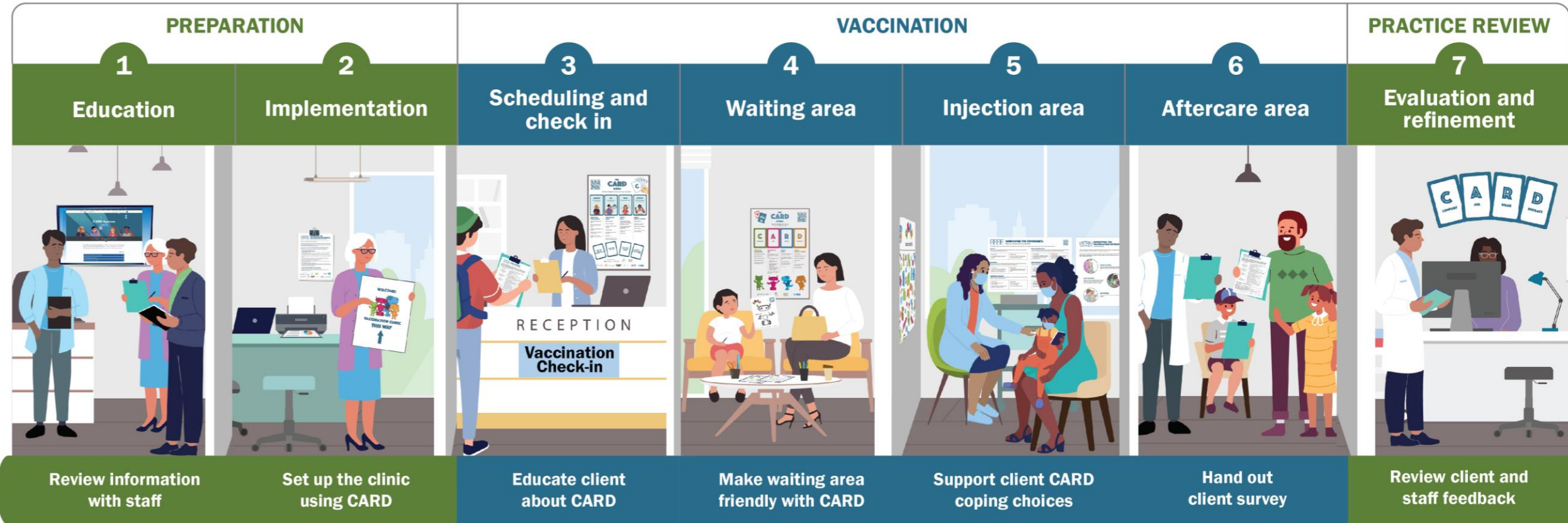
How CARD works – The 4E Model

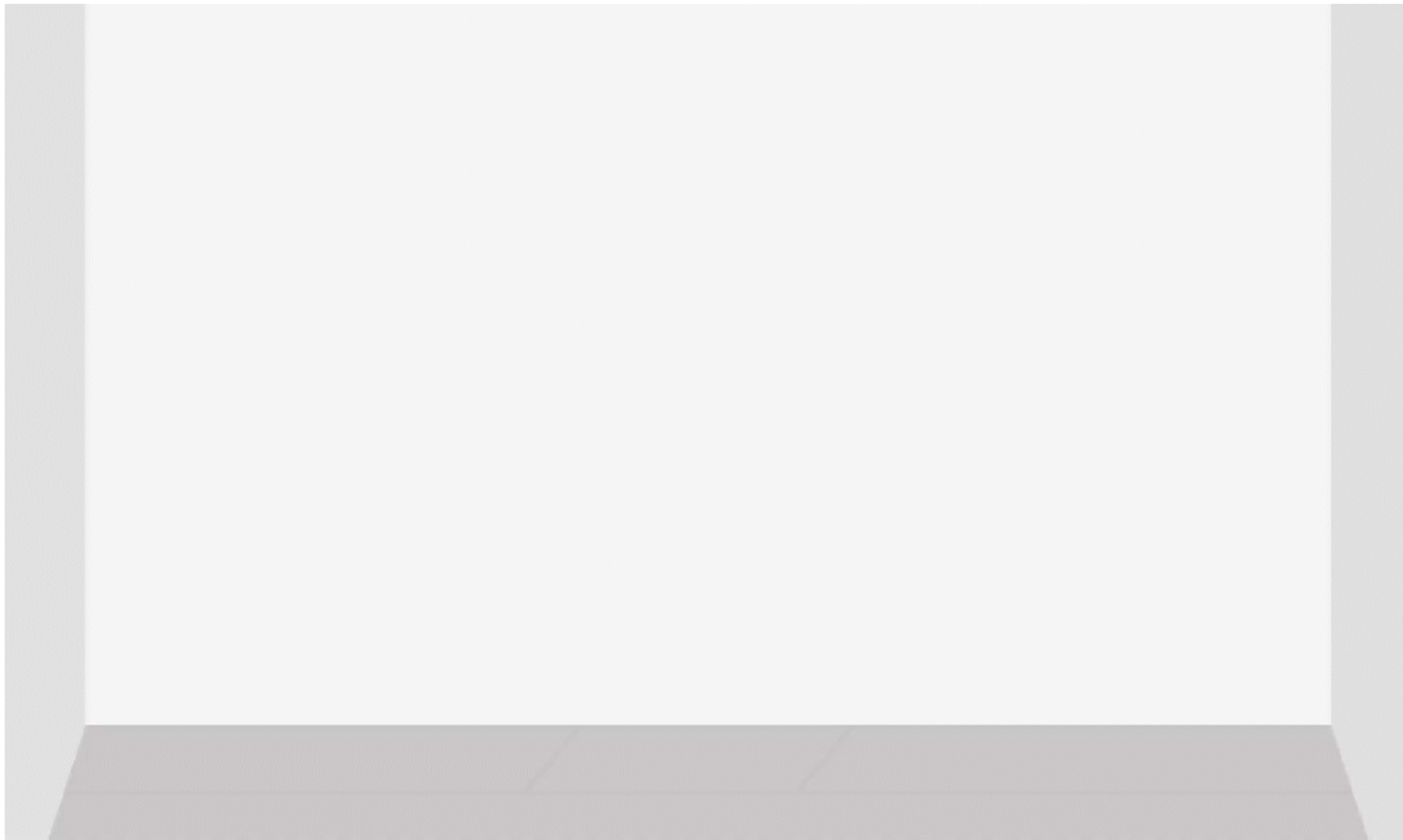


Education



Infographic of how to integrate CARD





Education (Provider)

Webcast - Needle fear, pain and vaccines

Watch later Share

CANVAX WEBCAST

Needle fear, pain and vaccines:

Introduction to the CARD system as a framework for vaccination delivery

April 20, 2022

PRESENTED BY THE PUBLIC HEALTH AGENCY OF CANADA | HOSTED BY CANVAX

Watch on YouTube



Dr. Anna Taddio
University of Toronto



Dr. C. Meghan McMurtry
University of Guelph

<https://www.youtube.com/watch?v=tCV8UIOnpOY>

“I have a lot more confidence”


CANADIAN PUBLIC HEALTH ASSOCIATION ASSOCIATION CANADIENNE DE SANTÉ PUBLIQUE

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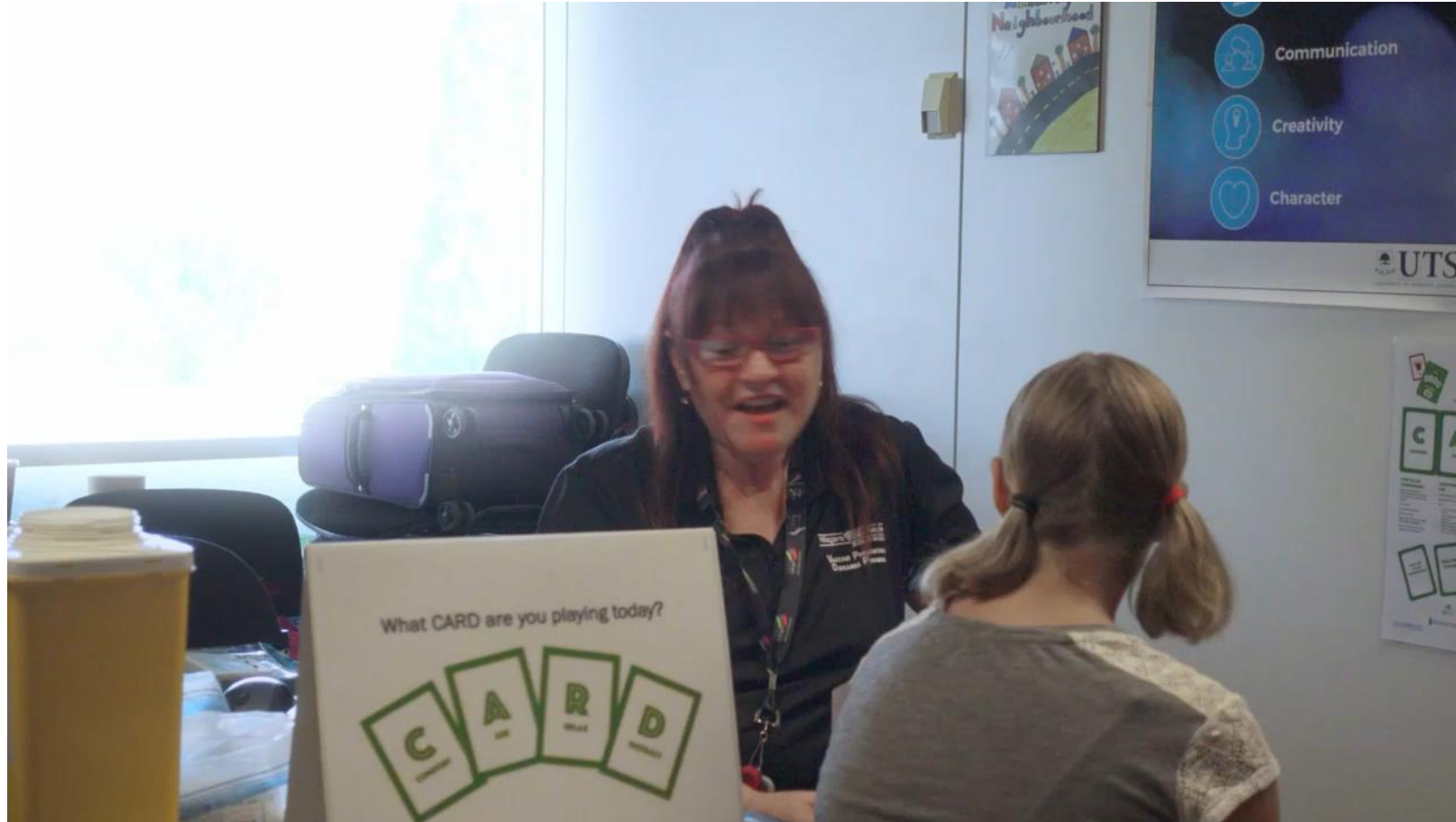


The CARD System

Explore the CARD System™ for improving the vaccination experience.

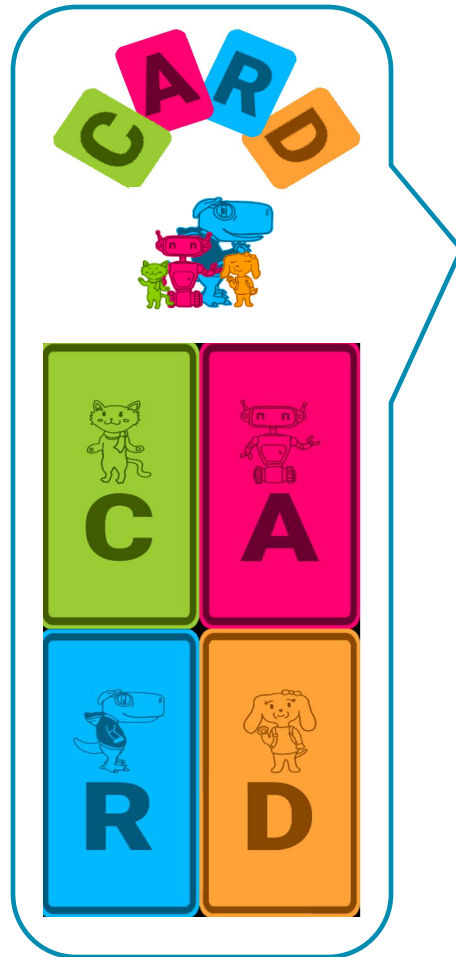
<https://learning.cpha.ca/course/index.php?categoryid=16>

CARD in action - gr. 7 school vaccinations



<https://youtu.be/FXj6ELi4BVg>

Education (Client)



CARD game



CARD CHECKLIST:
What cards are you playing today?

We use the CARD (Comfort Ask Relax Distract) system to help make you more comfortable during your vaccination. Fill in the CARD survey below to tell us how we can make your vaccination a more positive experience. If you would like to use a strategy that is not listed, let us know and we will try to do it. To learn more about CARD, visit CardSystem.ca.

CARD System	Choose all options you want for your vaccination
Comfort What would you like to do to make yourself more comfortable?	<input type="checkbox"/> Privacy (separate room with closed door) <input type="checkbox"/> Sit upright on a chair <input type="checkbox"/> Sit on a parent's or caregiver's lap <input type="checkbox"/> Lay down <input type="checkbox"/> Eat a snack or treat <input type="checkbox"/> Arm the needle goes in (left or right): _____ <input type="checkbox"/> Other: _____
Ask What questions do you have about the vaccine or your appointment?	<input type="checkbox"/> I have questions about the vaccine <input type="checkbox"/> I have questions about what will happen during my appointment <input type="checkbox"/> I have questions about using a medicine on the skin (topical anesthetic) to make the pain from the needle hurt less <input type="checkbox"/> Other: _____
Relax How do you want to keep yourself calm?	<input type="checkbox"/> No or low levels of noise <input type="checkbox"/> People I want to be with me (nobody or give names): _____ <input type="checkbox"/> No extra people around that can see me <input type="checkbox"/> Take deep belly breaths (like blowing up a balloon) <input type="checkbox"/> No alcohol wipe beforehand <input type="checkbox"/> Other: _____
Distract Do you want to be distracted during vaccination?	<input type="checkbox"/> Tell me when it will happen <input type="checkbox"/> Do not tell me when it will happen <input type="checkbox"/> No conversation with me while I am distracting myself <input type="checkbox"/> Keep my eyes closed or look away <input type="checkbox"/> Play with a toy or comfort item from home <input type="checkbox"/> Use my cell phone to listen to music or watch a video <input type="checkbox"/> Use a distraction toy or activity provided by the clinic <input type="checkbox"/> Other: _____

Did you review information about CARD before coming today?
☐ No. Please explain: _____
☐ Yes. Please explain: _____

➔ For children: Did you play the CARD online game? ☐ Yes ☐ No
 How old are you? _____ What is your gender? _____

Some people are afraid of needles. How afraid are you? ☐ Not at all ☐ A little bit ☐ Medium amount ☐ A lot
 Do you ever feel dizzy or faint during needles? ☐ Yes ☐ No

Tell us about anything else you want us to know: _____

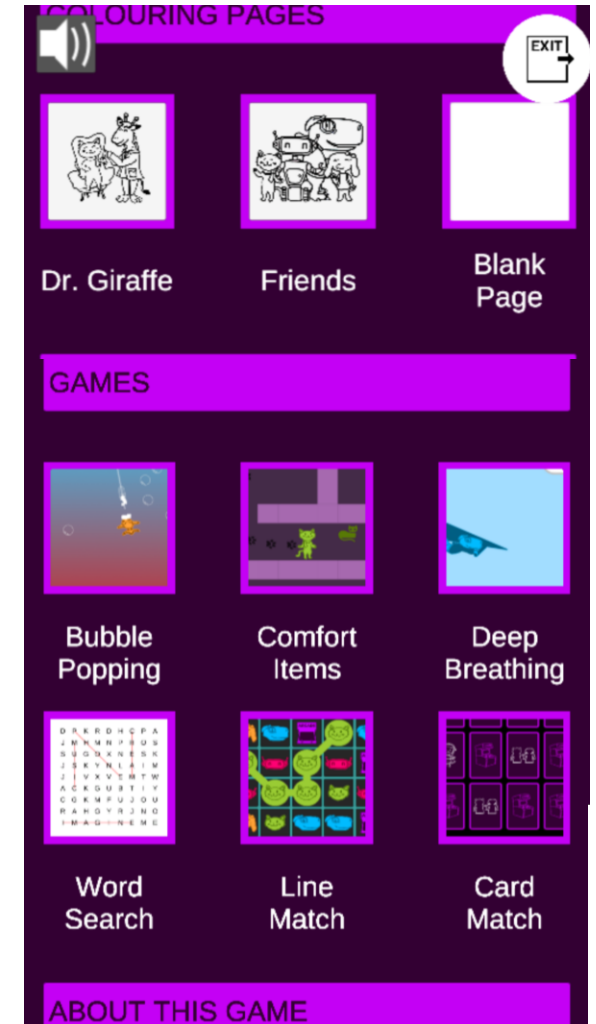
Proud contributors:

CARD checklist

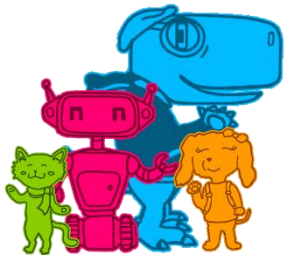
CARD game for children 5-12 years



- Characters introduce CARD and then educate players about coping strategies in the different letter categories.
- Minigames (e.g., breathing game) are embedded for practice and reinforcement of learning. Players then play a variety of minigames in the arcade (e.g., line matching).



CARD in action – child playing breathing game



<https://immunize.ca/card-game-kids>

Child feedback about CARD game

I learned
needles aren't
as bad as they
seem and it's
easy to distract
yourself.

I can tell my
friends, "Hey,
there's this
game and it
really helped
me."

I liked the
games because
they were kind
of simple but
fun and really
distracting.

It helped me be
less afraid
because you
can just breathe
in and out.



CARD checklist

The difference of having this piece of paper in front of me, prior to giving the vaccination - it gives me perspective already as to **what this child would prefer.**



CARD CHECKLIST:

What cards are you playing today?

We use the CARD (Comfort Ask Relax Distract) system to help make you more comfortable during your vaccination. Fill in the CARD survey below to tell us how we can make your vaccination a more positive experience. If you would like to use a strategy that is not listed, let us know and we will try to do it.

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Did you review information about CARD before coming today?

☐ No. Please explain: _____

☐ Yes. Please explain: _____

→ For children: Did you play the CARD online game? ☐ Yes ☐ No

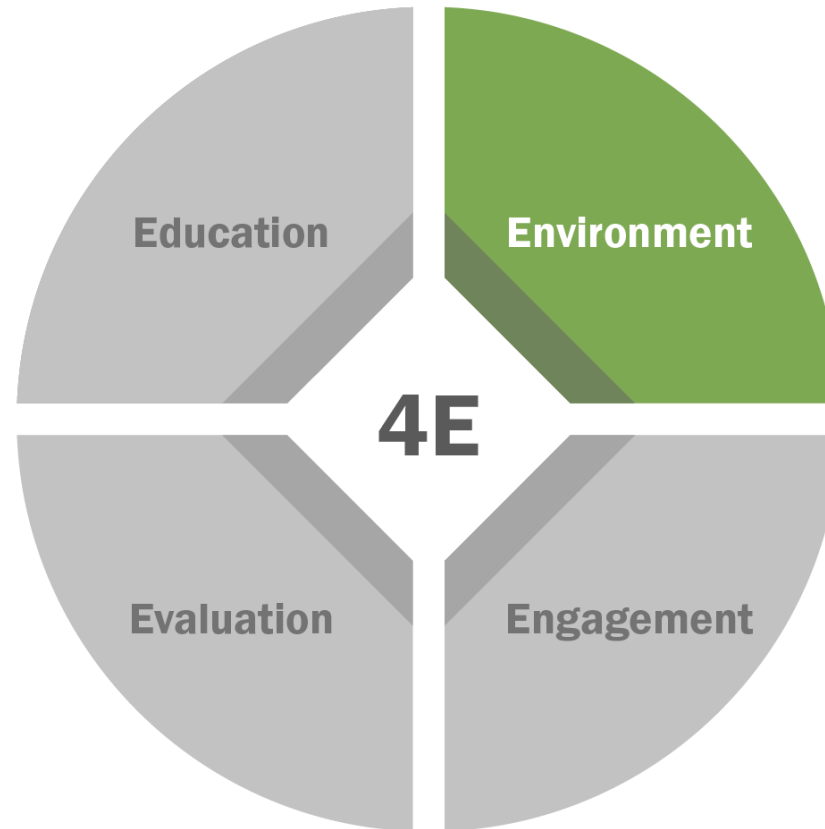
How old are you? _____ What is your gender? _____

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Do you ever feel dizzy or faint during needles? ☐ Yes ☐ No

Tell us about anything else you want us to know: _____

Environment

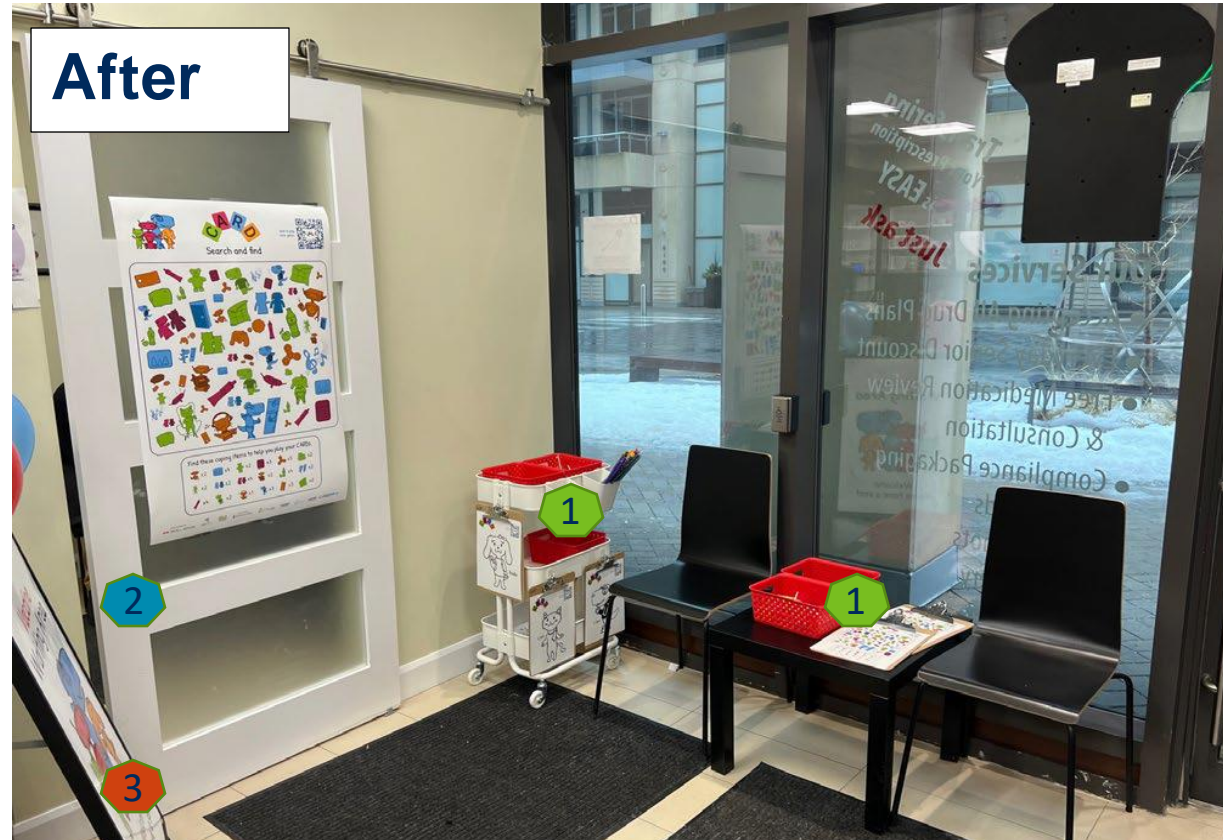


Environment

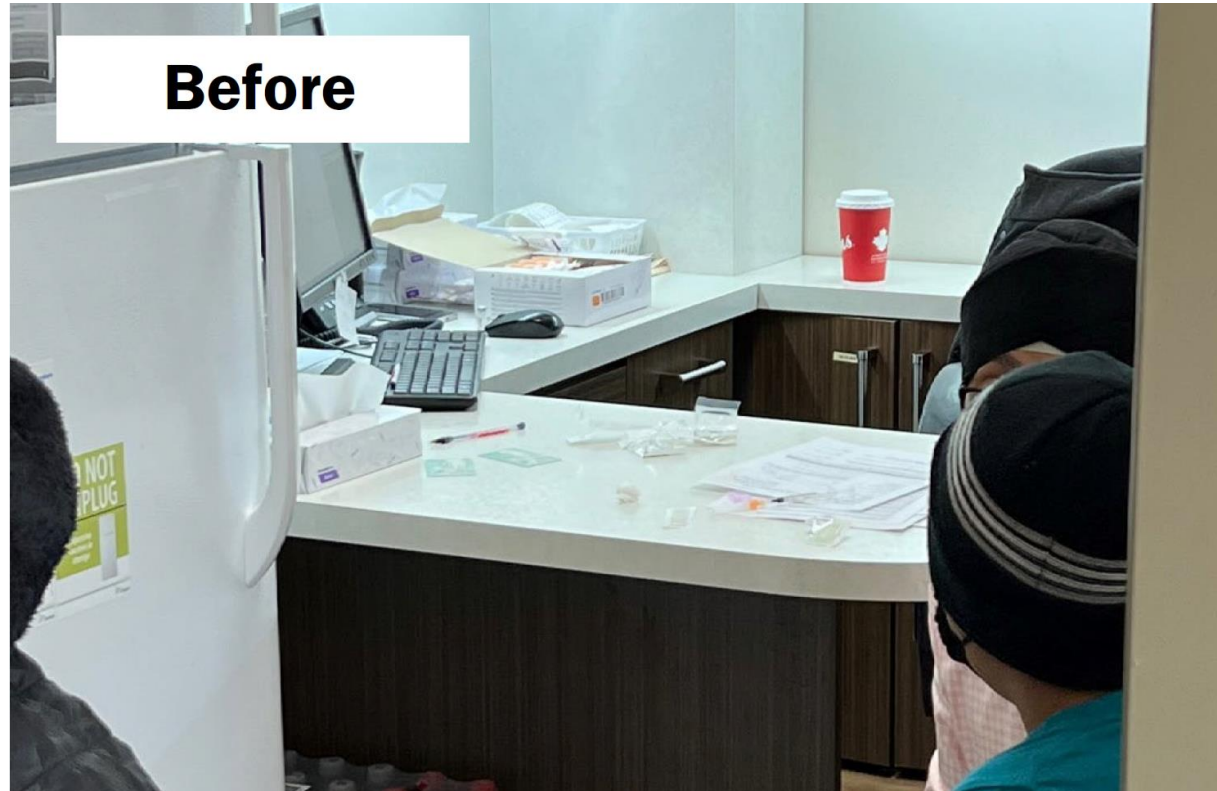


Environment

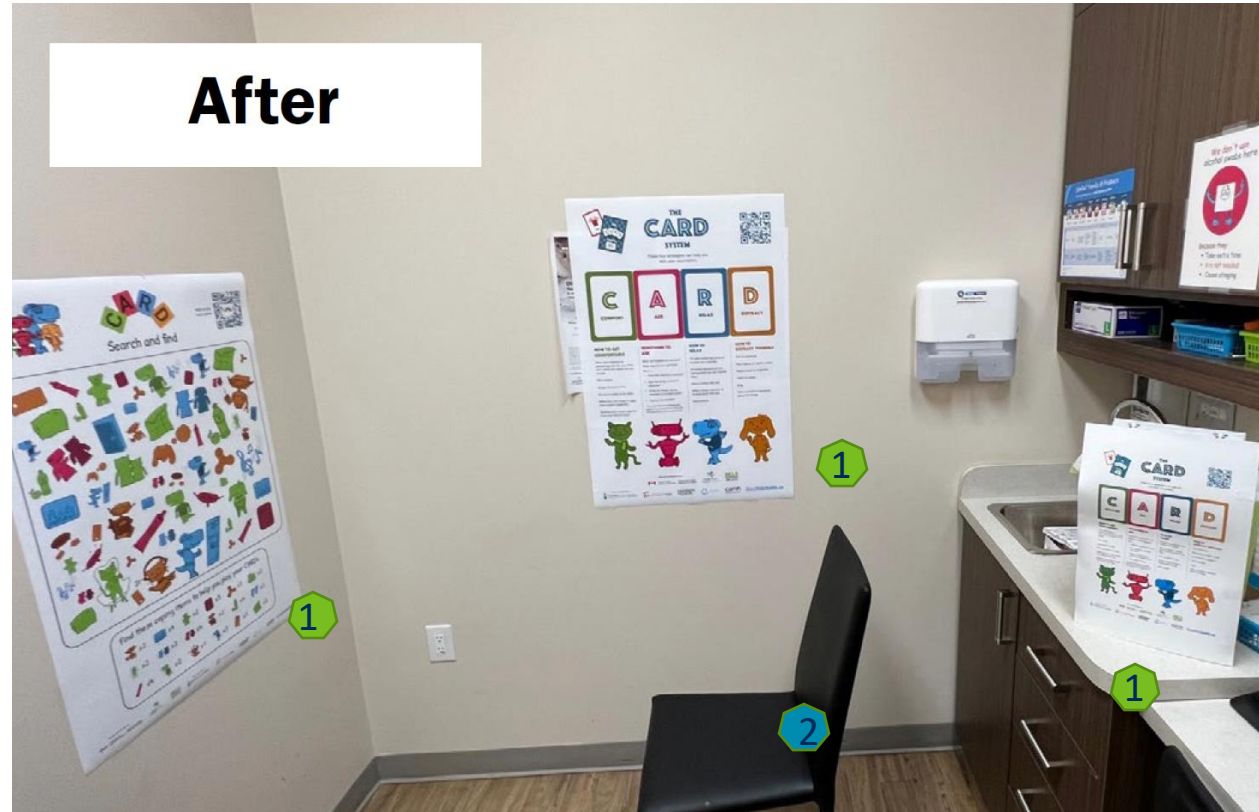
“Put up some posters, have toys that kids can play with, maybe colouring papers. The added cost is not much. Offer privacy...”



Environment



Environment



“So just reorienting the room a little - changing where people are looking and hiding things, like needles - can keep the fear much lower”

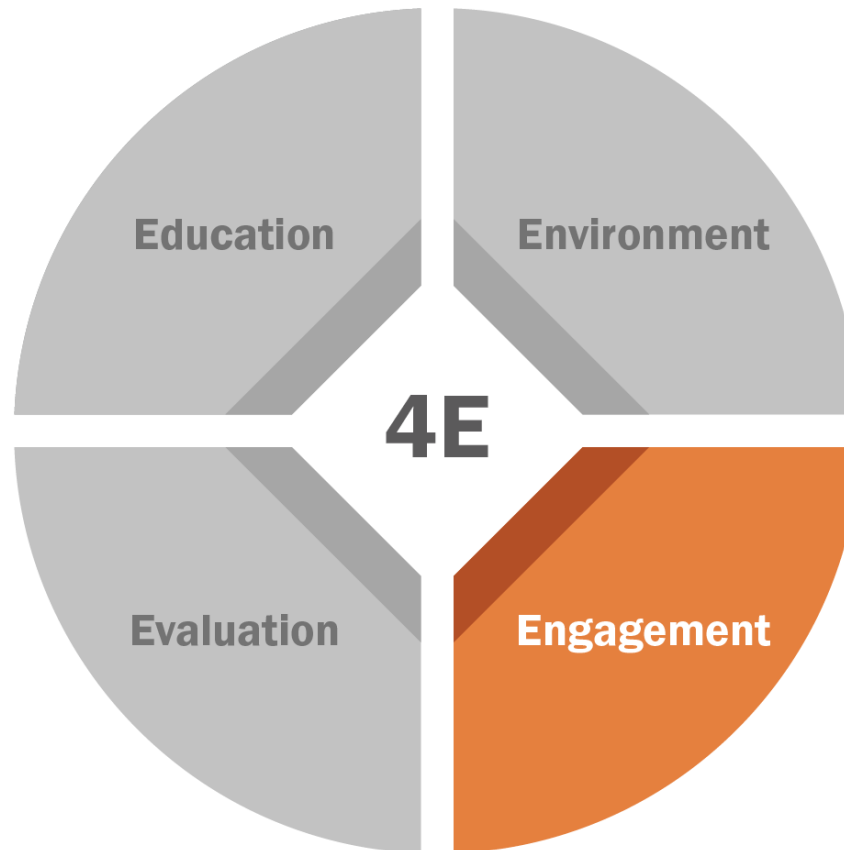
Environment



Coping interventions

“And that positive experience with topical anesthetics will probably make their next vaccine much better too because they’ll think about it much differently”

Engagement



Engagement

CARD **4E MODEL:**
A guide for providers of vaccination services

The **CARD** system (Comfort, Ask, Relax, Distract) is a framework that can be used to plan and deliver vaccinations. Each letter category (C-A-R-D) includes evidence-based activities that vaccinators and vaccine clients can **play** to reduce pain and other immunization stress-related responses (i.e., fear, headache, nausea, dizziness, fainting). Using **CARD** improves the vaccination experience for vaccine clients and staff.

Learn how to integrate **CARD** in your practice setting using the **4E model** (Education, Environment, Engagement and Evaluation) as a guide. For more information and resources, you can visit CardSystem.ca.



EDUCATION:
BEFORE VACCINATION DAY

- Staff:** Review information about **CARD** and share with staff. Address comments and questions and plan for how to integrate **CARD** into the vaccination process. Consider feedback obtained from vaccine clients about how to make vaccinations a more positive experience for them. Review the [CARD vaccination planning checklist](#) and [CARD vaccination day checklist](#) to select options for your setting. Integrate into vaccination policies and procedures.
- Clients:** Provide information about **CARD** ([CARD fact sheet](#)) to vaccine clients at various times in the vaccination process, such as at the time of booking and at vaccination appointment check-in. Include information about what to expect and available coping strategies in the different letter categories of **CARD** (i.e., Comfort, Ask, Relax, Distract) ([CARD checklist](#)).

ON VACCINATION DAY

- Staff:** Review **CARD** with staff and implement selected tools and processes.
- Clients:** Use the **CARD** checklist at vaccine appointment check-in to record demographic information (including the level of fear) and coping strategy choices. The completed **CARD** checklist can be used to guide the appointment. If [topical anesthetic](#) is checked off, staff can explain the required waiting period (e.g., 20 to 30 minutes for [Maxilene™](#), other products take longer). Assist with topical anesthetic application and give options to leave and return or engage in a distraction activity while waiting.
- If clients identify a history of fainting, counsel them regarding the prevention of fainting using [muscle tension](#) (and supine positioning).

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HELP
L'Équipe d'urgence
Kids Adults

Scan for more resources >

CARD **IMPROVING THE VACCINATION EXPERIENCE:**
What health-care providers can say

The words and actions of health-care providers can influence how someone experiences vaccination. Some behaviours can promote coping while others can increase distress. Use this fact sheet to learn ways to promote coping and more positive vaccination experiences. Share our resources for parents and caregivers on [what they can say](#), [how they can act](#) and [what they can do](#) to help their child during vaccination.

To learn more about **CARD**, go to CardSystem.ca.



BE CALM
Foster a calm environment and be positive. If you are calm and use your normal voice, others will feel that everything is OK.

TRY SAYING THIS
✓ "Let's work together to make your vaccination experience comfortable." (promotes calmness)

BE POSITIVE
Focus your attention on helpful things and on things that are going well. Use praise to encourage and recognize the efforts people are making. Congratulate people on getting vaccinated and help them to remember their vaccination in a positive way for the next time.

TRY SAYING THIS
✓ "You did a great job relaxing your arm, etc." (positive focus)
✓ Thanks so much for coming in today to get vaccinated. Let me know what you think helped and how I can help to make it even better the next time." (positive focus)


INSTEAD OF THIS
⊗ "There are so many people here today and I don't have a lot of time! Let's just get it done quickly." (makes others nervous)

INSTEAD OF THIS
⊗ "Finally, it's over; that was hard!" (negative focus)
⊗ "This took a long time. Maybe you should get vaccinated somewhere else next time." (negative focus)

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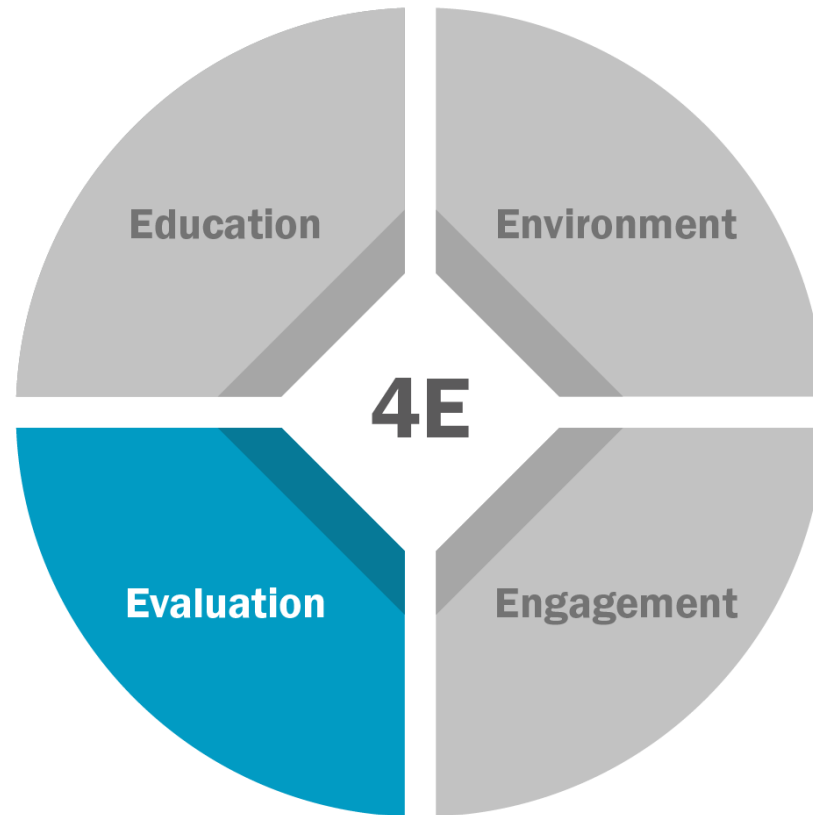
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L'Équipe d'urgence
Kids Adults

Scan for more resources >



Various pamphlets

Evaluation



Evaluation (Clients)



TELL US HOW YOU FEEL!

For individuals aged 8 years and older

Tell us about what happened so we can help to make needles a better experience for you if you ever need to get another needle. It's ok if you don't know or don't want to answer any of these questions.

1. Tell us how much the needle hurt.

Pick a number from 0 to 10, where 0 is no pain at all and 10 is the most pain possible.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

2. Tell us how scared/worried you were about the needle.

Pick a number from 0 to 10, where 0 is not scared/worried at all and 10 is the most scared/worried possible.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

3. Tell us how dizzy you were before, during and after the needle.

Pick a number from 0 to 10, where 0 is not dizzy at all and 10 is most dizzy possible.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ I fainted

4. Compared to the last time you got a needle, tell us if today's needle was better, worse, or the same.

☐ Better ☐ The same ☐ Worse ☐ I don't know ☐ I don't remember

Please explain. _____

“It made a big difference!”

“I almost cried reading the CARD checklist because I felt so cared for. Thank you!”

Evaluation (Providers)

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

“CARD made the entire process less stressful, for myself, as a vaccinator, for the child, and also the parents”

CARD staff debrief survey

Clinic Date: _____ Location: _____ Time: _____
Who was present: _____

Post-clinic debriefing sessions provide opportunities for staff to share successes and challenges and empower them to help each other learn from their experiences. Reflect on the vaccination program by using these questions as a guide. Include feedback from vaccine clients when answering the questions to ensure their perspectives are captured and considered. This will require reviewing/collating their feedback before answering the questions.

1. What went well and why?

2. What didn't go well and why?

3. Did the team work productively together?

4. What can we do differently to make it even better next time?



“All around positive reviews! I mean, you'd have to really be out of your mind as a parent or child to have a negative review about this, right?”

Case

Back to Sarah...

What can you/your organization do differently?



Summary of CARD domains (4Es)

Education

- Website, webinars, e-module, videos
- CARD checklist
- Posters, pamphlets

Environment

- Friendly/inviting (minimizes visual/auditory fear cues)
- Coping interventions available (distractions/activities)

Engagement

- Coping-promoting language and behaviour
- Address children directly
- Support coping choices

Evaluation

- Client and staff feedback



Here are some questions we get about CARD...





#1: Don't we already do this? How is CARD different?



- **CARD puts the patient first!** It engages patients in their care and is aligned with organizational strategic plans, mission statements and values of patients.
- **CARD is an innovation, like other innovations that we implement routinely in practice.** It is an evidence-based framework/protocol for performing needle procedures that improves patient safety and patient, family and staff satisfaction, so everyone wins!
- **CARD systematically integrates evidence** about reducing pain, fear and fainting, and leads to equitable care.
- Like any new protocol, **CARD is associated with some changes** – including more intentional and systematic ways of planning and performing needle procedures. **We learn from research and are constantly changing and improving our care by implementing innovations like CARD.**
- **CARD builds life skills for patients.** CARD educates and prepares children to cope with stressors and promotes coping and mental health.



#2: Will CARD will add time to the procedure?



- Providers report that **CARD reduces needle procedure time!**
- Skipping child preparation adds time because procedures are more complicated – children are more afraid, and more resources are needed (additional time and staff).
- More complicated procedures lead to negative memories of the experience and impacts future experiences negatively.
- CARD embodies the **child and family-centred care** model which dictates the expected approach to providing care. CARD is aligned with professional and organizational goals, mission statements and values.



#3: Isn't it good enough to provide distractions to the patients who need them?



- To provide equitable care, distraction items must be offered to **each patient**. Patients do not know what they are not aware of.
- Children do not advocate for themselves – they need to be invited to participate. Adults may not be aware of the preferences of children.
- Distraction carts are available all over the hospital with the intent they are offered to all.
- Distraction items serve multiple purposes – even if patients do not want to handle them, they can serve as visual distractions and facilitate procedures.
- Distraction carts reduce fear cues by making the environment more child friendly 😊



#4: Why do we need to use a CARD checklist when we can tell patients the coping options?



The **CARD checklist is intended to be filled in by patients**. It was developed this way to invite participation and promote patient autonomy.

Providers leading coping options is problematic:

- 1) Children have difficulty processing verbal instruction (it is too quick for child to understand and process options) and they are often rushed during the process
- 2) It inadvertently leads to missing some options to increase expediency (i.e., providers will skip options they think are not needed/important) which is not equitable
- 3) Children do not advocate for their preferences, which leads to them settling for interventions recommended by adults
- 4) Children are not prepared and are not using their preferred coping strategies.



#5: Can we just do one letter category/ can we leave some parts of CARD out?



- Pain care involves multiple components. The **CARD protocol includes these components in the 4E model (4E's: Education, Environment, Engagement and Evaluation)**. All components contribute to better pain care and work better when they are integrated together. We need to follow the research evidence.
- We have moved away from a provider-led to **person-centred** approach.

Summary

- Pain and fear *hurt* everyone
- CARD integrates all we know about pain and fear
- Visit www.cardsystem.ca and *start playing!*



*“I love my job,
and this made
it better”*

Please complete our CARD survey



What's YOUR play?

"I love my
job and this
made it
better"



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