



MAYO CLINIC
Mayo Medical Laboratories

Solutions to Reduce Pediatric Phlebotomy Pain and Improve the Overall Healthcare Experience

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Speakers



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Disclosures

Relevant Financial Relationship(s):

Nothing to Disclose

Off Label Usage:

Nothing to Disclose



Poll Everywhere Instructions

- Web browser (smart phone, tablet, computer browser)
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OR

- Texting
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 - It will send a response saying “You’ve joined Jeremy Zacher’s session (DLMP).” At the end of the session when we’re done, reply “leave.”



Objectives

- List age appropriate pain relieving options for pediatric patients
- Evaluate the efficacy of pain relieving options for pediatric patients undergoing phlebotomy
- List the barriers and approaches to increasing the utilization of pain relieving options for pediatric patients undergoing invasive procedures



Outline

- Pediatric procedural pain
- Importance of pain interventions
- Efficacy and age appropriateness of pain interventions for venipuncture
- Overcoming barriers to implementing and consistently offering/using pain interventions



Common Invasive Procedures in Neonates

- Vaccinations
- Heel puncture (newborn screen)
- Circumcision
- Venipuncture



Common Invasive Procedures in Toddlers/Preschoolers

- Vaccinations
- Finger stick or venipuncture
 - lead or anemia screening
- Stitches



Common Invasive Procedures in Older Children/Teens

- Vaccinations
- Finger stick or venipuncture
 - lipid or diabetes screen

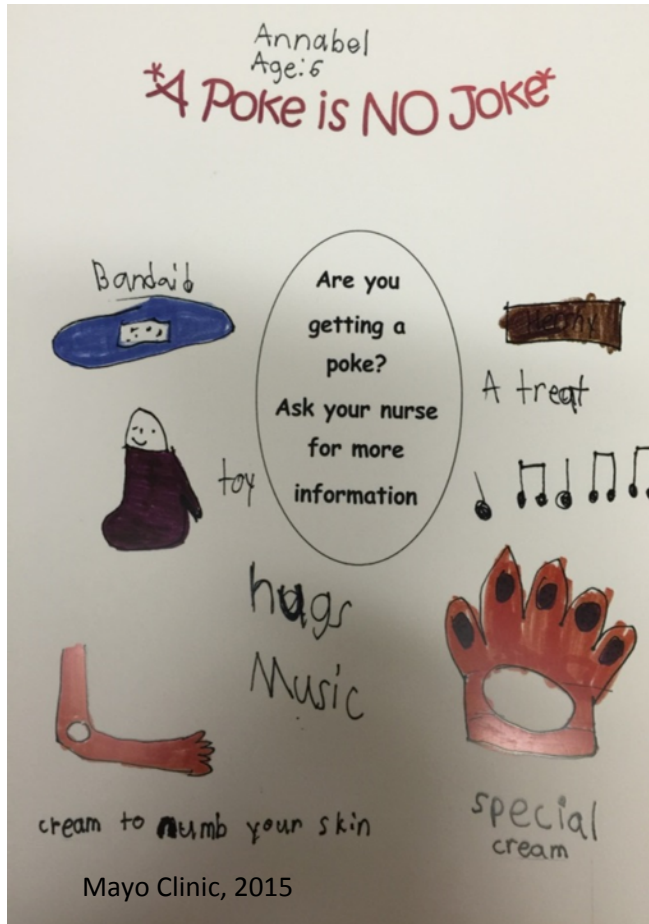


Pediatric Procedural Pain Studies

- Neonatal Studies
 - Difficult population to assess pain
 - Studies report crying time, grimace, parent report/response, observer reported (NIPS)
- Infant Studies
 - Observer/parent reported (FLACC scale)
- Toddler/Preschool Age Studies
 - Parental and patient anxiety vs physical pain
 - Studies report (faces scale)
- Older children Studies
 - Self reported pain
 - Observer reported (1-10 number scale)



PAIN RELIEF MAKES A DIFFERENCE!



We cannot take away all the pain & distress associated with pokes, but we can certainly lessen them.

Goal is to give children ways and tools to better cope with pokes, medical procedures, and life.

Children consider needle pokes as one of the most frightening and painful health-related events, potentially leading to:

- Health care avoidance behaviors across their lifespan
- Vaccine non-compliance
 - Potential to contribute to outbreaks of vaccine-preventable diseases
 - About 10% of the population avoids vaccination & needle procedures
- Fear of needles
 - Estimated 25% of adults

(Chan, Pielak, McIntyre, Deeter, & Taddio, 2013; Taddio et al., 2015; Taddio et al., 2010; WHO, 2015)



Importance of Pain Interventions

- Recognized in the medical principle to
“First, do no harm.”
- Pain relief is considered a basic human right
- Lack of pain management exposes children to unnecessary suffering
- Pain and distress have a negative impact on the child’s level of cooperation & increase the need for physical restraint

(Taddio, Chambers et al., 2009)



What techniques do you use?

Restrain child
or lay on a
table

Sitting/comfort
positioning
(holds)

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Interesting Facts



The most frequently reported painful events in a hospitalized child were IV starts, pokes and lab draws.

(Wong & Baker, 1988; Inal & Kelleci, 2012)

Performance metrics (clinical indicators and patient satisfaction) are affected by pain control and compassion.

- Press-Gainey – feeds reimbursement
- Discharge questionnaire
- Post-clinic visit questionnaire



(Chan, Pielak, McIntyre, Deeter, & Taddio, 2013)



World Health Organization & the Center for Disease Control

- Applying principles for immunizations to all “pokes”
- Pain relief/management is considered part of good clinical practice
- Canada, USA, UK, etc. are now implementing pain mitigation strategies
- Pain during pokes is manageable
- Pain mitigation may help counter vaccine/poke hesitancy
 - Have caregiver present
 - Hold infants & young children and allow children to sit upright
 - Using proper technique and appropriate size needle
 - Offer one or more pain relieving options

(Kroger, Sumaya, Pickering, & Atkinson, 2011; WHO, 2015)

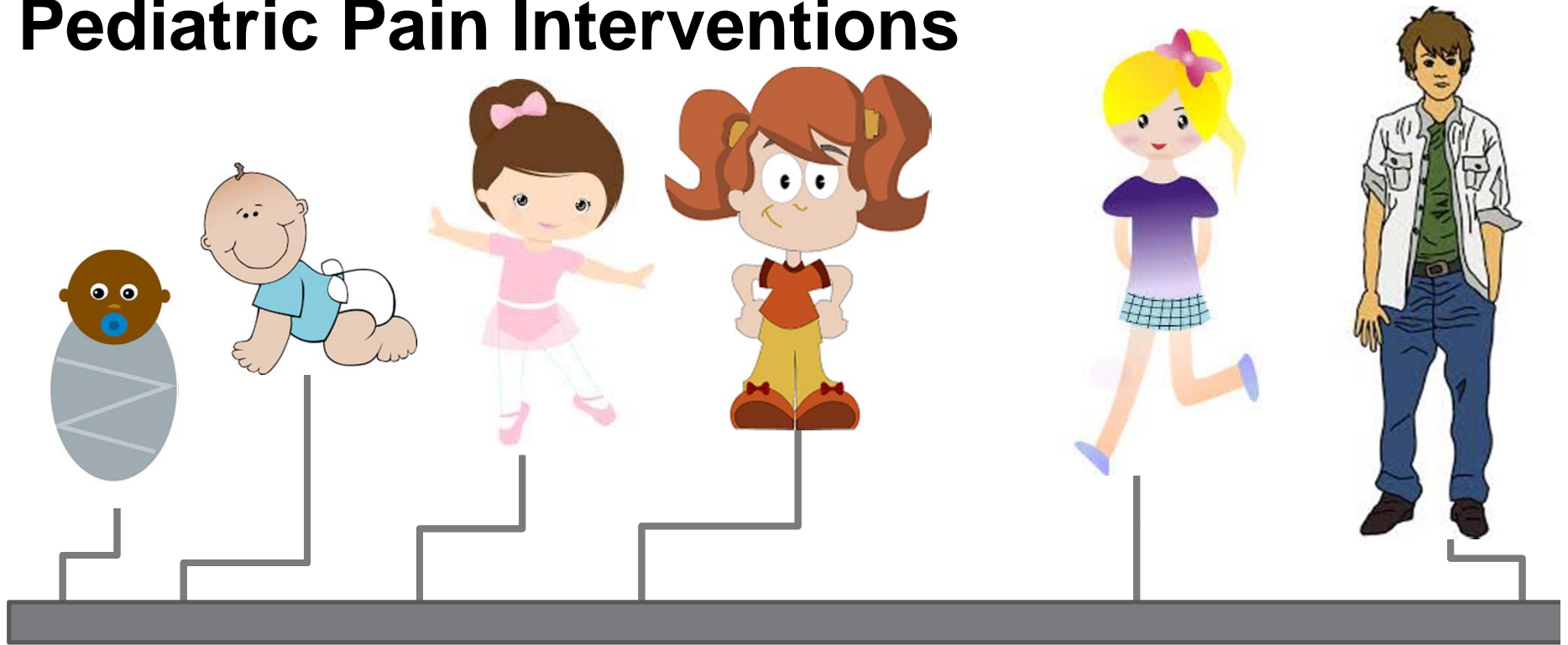


Pain Interventions for Lab Collections

- Age appropriateness
- Safety
- Efficacy
- Barriers



Pediatric Pain Interventions



Nutritive sucking
 Non-nutritive sucking
 Skin-to-skin contact

Topical analgesics
 Vibration/cooling
 Comfort positioning

Vapocoolant spray
 Distraction

Topical analgesics
 Vibration/cooling
 Comfort positioning

Vapocoolant spray
 Distraction

Topical analgesics
 Vibration/cooling
 Comfort positioning

**ORAL SUCROSE
BREASTFEEDING
TOPICAL ANALGESICS
VIBRATION/COOLING
VAPOCOOLANT**



the following is least effective at reducing pain in a 1-year old?

- Lidocaine topical analgesic
- SweetEase[®] (sucrose+pacifier)
- Breastfeeding
- Buzzy[®] Bee (using vibration only)
- Shin-to-skin contact with parent

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- SweetEase® (sucrose+pacifier)



Oral Sucrose



(Mayo Clinic, 2016)

- Oral Sucrose 24% (Sweet-Ease[®])
 - Give 2 minutes prior to any poke or procedure
 - Absorbed in cheek and sublingually, not swallowed
 - Utilizes opioid pathways
 - Synergistic with sucking
 - Pacifier
 - Gloved finger
 - Calming effect
 - Reduction in pain behaviors

• (<http://www.usa.philips.com/healthcare/product/HC989805603401/sweet-ease-natural-15-ml-cp>)



(Mayo Clinic, 2016)



Pain Relief of Oral Sucrose Ages up to 6 months



Pros

- Effectiveness diminishes with age up to 6 months
- Improves all measures of pain
- Won't effect blood glucose levels
- Considered a food, not a medication

Cons

- Logistics of administering is a barrier
- Document as a medication (dose, time administered, etc.)
- Adverse effects are mild (coughing / gagging)
- Contraindicated in some patients



Breastfeeding

- Reduces stress
 - Physical comfort
 - Sucking
 - Distraction
 - Sweet-tasting milk



Mayo Clinic, 2016



Pain Relief of Breastfeeding Ages up to 1 Year



Pros

- Simple, cost neutral & natural
- **Effective** up to one year old
- All measures of pain
- Parent involved

Cons

- Baby may be sleepy or not hungry
- Maximum effectiveness achieved when baby is latched before, during, and after procedure
- Efficacy only studied for single procedure, future success of breastfeeding not evaluated

(Harrison, Reszel, Bueno, Sampson, Shah, Taddio, Larocque, Turner, 2014; Shah, Herbozo, Aliwalas, & Shah, 2012)



Should oral sucrose be avoided for POC glucose checks?

Yes

No

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your institutional policy support offering oral
to all babies <6 months prior to lab collection.

Yes

No

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Topical Analgesics

- Require some planning to implement
 - Time
 - Cost (Taddio et al., 2015; WHO, 2015)
- Lidocaine 4% (LMX-4[®])
 - 30 days and older
 - 30 minute onset
 - Penetrates to muscle
 - OTC
- Lidocaine/Prilocaine (EMLA[®])
 - 37 weeks gestation
 - 60 minute onset
 - Requires prescription



(Mayo Clinic, 2016)



(Mayo Clinic, 2014)

Occlusive Dressing Tips

- Have child remove the dressing or lift corner, pull parallel to skin while holding down opposite corner, then lift off
- Place a sticker on top of dressing
- Cover with pants or wrap a blanket around dressing



(Mayo Clinic, 2016)

Pain Relief of Topical Analgesics

Ages one month and up



Pros

- Effective at reducing procedural pain
- Improves all measures of pain

Cons

- Logistics of administering is a barrier to use
- Medication may require a nurse or provider prescription/application



have lab staff apply a topical analgesic prior to
collection?

Yes

No

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Buzzy® - The Vibrating Ice Pack



(Mayo Clinic, 2016)

- All ages (vibration), 18 months up for vibration plus ice
- Gate theory of pain – interrupts pain fibers
- Cold and vibration help relieve pain
- Distraction (Baxter, Cohen, McElvery, Lawson, & von Baeyer, 2011)
- Vibration alone on NICU patients reduced pain scores and heart rate upon heel lance (McGinnis, Murray, Cherven, McCracken, & Travers, 2016)
- <https://buzzyhelps.com>

Buzzy® - The Vibrating Icepack

- Injections, lab draws, or IV starts
 - With Buzzy® activated, wait at least 15 seconds before giving injection or doing the blood draw
 - Place between “pain and the brain”
 - Slide Buzzy® 2-3 cm proximally (closer to head), making sure it is out of the way of the zone to be prepared
 - Leave Buzzy® vibrating above site during skin prep and administration
 - Children 3 and under may not like the ice – use buzzy alone

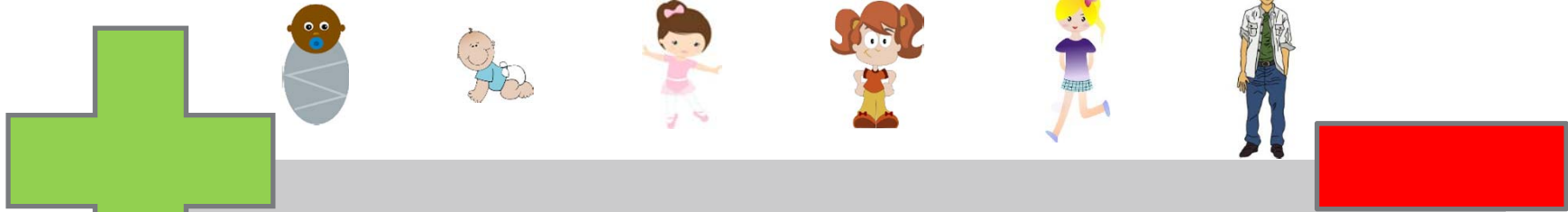


(Mayo Clinic, 2016)



Pain Relief of vibration/cooling

Any age



Pros

- Effective at reducing pain including heel sticks (vibration only)
- Easy to use

(McGinnis, Murray, Cherven, McCracken, & Travers, 2016)

Cons

- Cleaning between uses
- Cold *may* impact lab results (weak data)
- Most efficacy studies published by Buzzy[®] inventor

(Lima-Oliveira, Lippi, Salvagno, Campelo, Tajra, Gomes, F. dos S., ... Guidi, 2014)



Should I use Buzzy or a similar device prior to pediatric
collection?

Yes

No

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Vapocoolants (Pain-Ease[®] Spray)

- Ages 3 and up
- Vapocoolant spray that controls pain during injections and minor procedures
- Interrupts body's experience to pain
- Works immediately by reducing the skin temperature by 1-3 degrees
- Easy to apply & cost effective (multi-use container)
- May be reapplied after 1 minute as needed
- <http://www.gebauer.com/painease>



(Mayo Clinic, 2016)

Do you use vapocoolants for phlebotomy procedures?

Yes

No

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How effective do you know/think vapocoolants are at reducing pain?

Very effective – they should be used frequently

Moderately effective – they should at least be offered to all patients

Minimally effective – use upon patient request

Not effective – not used

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Pain Relief of Vapocoolants

Age >3 years



Pros

- Quick acting
- Easy to use
- Also a distraction – be creative

(Hogan, Smart, Shah, & Taddio, 2014)

Cons

- Some report pain of cold is almost equal to pain of poke
- Non-significant reduction in pain for children vs placebo (water/alcohol spray)
- Not for use <3 (yet)



DISTRACTION TECHNIQUES & COMFORT POSITIONS



Distractions

Active

- Interactive toys (iPad, games)
- Virtual reality
- Controlled breathing (bubble blowing, party blowers)
- Guided imagery (relaxation)

Passive

- Auditory (music, reading)
- Audiovisual (television with eyeglasses)

(Chambers, Taddio, Uman, McMurtry, & HELPinKIDS Team, 2009)





(Mayo Clinic, 2016)



Effective are distractions at reducing pain in controlled studies?

Very effective

Marginally effective

Not effective

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Distractions

- Evidence supports distraction to manage pain, however the quality of evidence is poor due to variability of studies.
- Most effective in 6-12 year olds
- Tailor the method to child's preference and/or temperament (present choices)

(Birnie, Noel, Parker, Chambers, Uman, Kisely, & McGrath, 2014; Koller & Goldman, 2012)



Comfort Positions

- A “hug” from a parent or caregiver as an alternative to restraining a child. Nurse or provider stabilizes the limb to be immunized
- Allows children to feel
 - Secure
 - Reassured
 - Empowered
- Find appropriate comfort position to meet the individual needs of the child



Comfort Positions

- They support family-centered care
- They help children cope with medical experiences and teach them skills for future visits
- Children become more compliant
- They help to enhance a child's medical experience

(Mayo Foundation, 2016)



Comfort Position Tips

- Do not have the child lying supine during injections - they should be sitting upright
 - 6 months old
- Do not forcibly restrain - this increases fear and the child loses sense of control
- Breastfeeding during poke – establish a good latch first
- Comfort positions
 - Comfortable and close proximity

(Taddio et al., 2015; Taddio, Ilersich et al., 2009)



Comfort Positions for Infants

- They can isolate an extremity for procedure or poke
- They allow for active caregiver participation
- They decrease stress, not only for the patient, but for caregiver & staff



(Mayo Clinic, 2016)



(Mayo Clinic, 2016)



*** Always offer praise after a poke!**



(Mayo Clinic, 2016)



Comfort Positions for Pre-School/School Age

- Choose non-aggressive & non-threatening holds
- Do not lie them down on the exam bed
 - Control issue for children
 - Scary/vulnerable position to be in



This position could also use on a bench for a poke... don't be afraid to get creative!



(Mayo Clinic, 2016)

Keep child close to the parent – no space



(Mayo Clinic, 2016)



Remember to offer praise & comfort to the child after the poke!



(Mayo Clinic, 2016)



Be creative!

Use distractions with a comfort position.



(Mayo Clinic, 2016)

Additional Strategies

- Deep breathing
- Presence of caregiver to lower stress (WHO, 2015)
- Be honest – explain what is about to take place and why
- Age appropriate language
 - Use “poke” instead of shot
 - Use “bed” instead of table
- Assess situation, implement the best pain management strategy, then poke

(Chambers, Taddio, Uman, McMurtry, & HELPinKIDS Team, 2009)



UNDERUTILIZATION OF PAIN RELIEVING OPTIONS

REDUCING BARRIERS

ADDRESSING WORKFLOWS



Pain management strategies are underutilized...

- Adoption of pain-relieving techniques into clinical practice are not optimal
- Lack of knowledge about pain & effective pain prevention strategies
- Persistence of attitudes about pain
 - Interfere with existing clinical practice/workflow
 - Personal bias & beliefs regarding pain related to immunization and pain-relieving techniques
 - These are not literature based

(Taddio, Chambers et al., 2009)



Topical Analgesic Facts

- Pain ratings were higher during subsequent needle-related procedures when a placebo was used instead of a topical analgesic

(Weisman, Bernstein, & Schechter, 1998)

- Topical analgesics are often underutilized by healthcare providers

(Jefferis, Scott, & Green, 2011)

- Parents are willing to wait and pay for topical analgesics

(Walsh & Bartfield, 2006)



Workflow challenges

- Time
 - When practiced routinely, it doesn't have to add time to the procedure
 - Implement beforehand
 - Educate parents & staff

(Taddio, Chambers et al., 2009)

- Staff attitudes/perceptions
 - “We’ve always done it this way”
 - “It’s just a quick poke”
 - “A child should get used to it”



Process Interventions

- Educate phlebotomists about pain management
 - Seek permission to use various pain relieving options (distractions, topical analgesics, oral sucrose, etc.)
 - Incorporate their use into normal routines
 - Appointment guides/instructions for topical analgesics
 - Offer multiple strategies whenever possible
- Educate parents and children 3 years and older about pain management (Taddio et al., 2015)



We need to move away from what is best for the provider to what is best for the patient.

- Identify the best approach to deliver patient-centered care
- Choose the least traumatic approach
- Change our way of thinking



Talking Points

- How to present interventions to the caregiver/child

- Facts & talking points



Comfort Positioning/Holds

“Would you like to hold your child while we draw this lab?”

- Research shows they are less frightened, do better, and recover faster
- Research shows they will not associate you with the pain. Instead they will associate you with comfort & support by your presence & hugs
- Children become frightened and feel vulnerable when lying on their backs. They are more comfortable sitting up or swaddled in a blanket



Topical Analgesia Cream (4% lidocaine)

*“This cream will make you feel the poke less.
It numbs the skin & muscle.”*

- This cream uses lidocaine to numb the skin and muscle making pokes less painful
- During future visits they will know that it doesn't hurt as bad and may be less anxious

Oral Sucrose 24%

“This sugar water helps with pain relief and also acts as a distraction to babies up to 6 months old.”

- The sugar water is absorbed in the cheek or under the tongue and works like pain medication when given a few minutes before a poke
- They don't drink a large amount
- Babies like the sweet taste
- It works even better when combined with sucking



Buzzy® - The Vibrating Icepack

*“Buzzy will help you feel the poke less.
It is cold and it vibrates.”*

- This vibrating icepack works by confusing the nervous system so that it doesn't hurt as bad
- It should help make the poke feel less
- It can be used without ice
- Place “between the pain and the brain”
- Great distraction



Breastfeeding

“Breastfeeding your baby during pokes can help control pain. They benefit from the sweet taste, physical comfort from mom, and sucking.”

- Establish a good latch and breastfeed a few minutes before the poke
- No evidence that babies will gag or associate their mothers/breastfeeding with pain
- No bottle feeding



Take Home Points

- Children cannot always advocate for themselves or express what they are feeling
 - They are at risk of developing long-term consequences from unmitigated pain
- There are options available that should be offered to children.
 - Combine methods for optimal results.
- Educational efforts are needed

(Taddio, Ilersich et al., 2009 ; Taddio et al., 2015; WHO, 2015)



Take Home Points

- Remember that children will still cryand that's OK.
- Do not guarantee that they won't feel it. They will feel it less.
- After done – ask child if it helped. Each child is unique.
- Remember to offer praise.



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THANK YOU!



Questions & Discussion



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