Chest Diseases
Hospital
Staff Development Unit

Children Pain

Presented by:
Dr.Mariam Mohammed

PhD. Pediatric Nursing
MS.c Pediatric Nursing
Assistant Director of Nursing
Staff Development Unit

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Introduction

- Pain is not only a feeling, but always demands a reaction both motor and emotional.

- Not easily evaluated and an objective technique for measuring pain is unreliable.

Definitions of pain:

- Pain is subjective feeling.
- Pain is what is the patient says it does.
- Pain is an unpleasant sensory or emotional experience associated with actual or potential damage.
- Pain is the body's defense mechanism that indicates the person is experiencing a problem.

Function of Pain

- As pain is a critical component of the body's defense system.
- Promote the healing process, since most organisms will protect an injured region in order to avoid further pain.
- Rarely, people are born with congenital insensitivity to pain. These persons usually have short life spans and suffer numerous dangerous ailments such as unnoticed broken bones, bedsores, and chronic infections.

Physiology of pain

- **The term pain is a subjective experience that typically accompanies nociception (is the sensory nervous system's response to certain harmful or potentially harmful stimuli). However, pain may also arise in the absence of any stimulus, and thus the proper definition of pain should include the emotional response to an actual or potential harm. Nociception, on the other hand, is a purely neurophysiological term that denotes specific activity in nerve pathways. (Table1,2,3)**

Physiology of pain

- **Nociceptive inputs are mediated through a complex system of receptors and pathways. From the affected organ, the nociceptive signal is transmitted through the first order neuron via the dorsal root to a synapse in the spinal cord from where the second order neuron ascends through the spinothalamic tract. The main pathway ascends through the dorsal horn of the spinal cord, crosses the midline to the opposite side of the spinal cord, and reaches the brain's thalamus through the anterolateral white matter. From the thalamus, the signal is transmitted through the third order neuron to the somatosensory cortex.**

Physiology of pain

- **Modern, highly reliable, and sophisticated neuroimaging techniques such as positron emission tomography (PET) have helped to identify the cortical networks involved in processing of nociceptive stimuli. For example, a number of studies showed that the activity in the periaqueductal gray matter (PAG) in the midbrain increased during a cold pressor test. Remarkably, these areas are also parts of the brain "punishment" pathway. Areas of the cortex, such as primary and secondary somatosensory cortex, the anterior cingulate cortex, and the rostral insula are directly involved in perception and evaluation of the painful stimulus.**

Physiology of pain

- **Many studies concentrate on the role that the anterior cingulate cortex plays in the processing of the psychological (affective) component of pain and attempt to quantify the suffering and unpleasantness experienced by the patient through objective measurement of brain activation. We may safely assert that there is a way to measure pain and pain relief. Even though the cost of PET and other modern techniques of visualizing activity of the brain are currently prohibitive for brain are currently prohibitive for widespread use, future physicians may be able to objectively measure both the pain and the pain relief offered by a specific medication, thus eliminating the reliance on subjective measures and self-reporting.**

Physiology of pain

- Acetaminophen /Tylenol®
- Aspirin
- NSAIDS (Ibuprofen/Advil®, Meloxicam/Mobic®, Diclophenac/Voltaren® etc.)
- Ketorolac /Toradol®
- Tramadol /Ultram®
- Opioids (Morphine, Codeine, Methadone, Fentanyl etc.
- Anti-Arrhythmics (Mexiletine /Mexitil®)
- Antidepressants (Amitryptiline /Elavil®, Nortryptiline /Pamelor®, Doxepin /Sinequan® etc.)

Table 1. The Nociceptive Pathway

Step	Process	Location	Process
1	Transduction	Affected organ	Translation of pain stimuli into nerve impulses that are sent into the spinal cord along the Ad and C fibers.
2	Transmission	Spinal cord	The nerve impulses are transmitted into the brain along the sensory tracts of the spinal cord.
3	Modulation	Spinal cord and brain	The nerve impulses are dampened or amplified in the spinal cord and in the brain.
4	Perception of pain	Brain	The modulated result of the physical (nociception) and the psychological (suffering) components results in the conscious awareness of the pain.

Source: Data from Pedtrovic et al. , Frankenstein et al. , and Weisenberg .

Table 2. The World Health Organization Pain Ladder

Step	Type of pain	Types of medications
1	Mild to moderate	Non-steroidal anti-inflammatory drugs(NSAIDS) + adjuncts + non-pharmacological approaches
2	Moderate	Step 1 remedies + opioid as needed
3	Moderate to severe	Step 1 Plus continuous long acting opioids
4	Breakthrough pain	Step 3 + Short acting opioid for breakthrough

Source: Data from WHO

Table 7.3. Side Effects of Common Pain Medications

	Acetaminophen /Tylenol®	Aspirin	NSAIDS (Ibuprofen/Advil®, Meloxicam/Mobic®, Diclophenac/Voltaren® etc.)	Ketorolac /Toradol®	Tramadol /Ultram®	Opioids (Morphine, Codeine, Methadone, Fentanyl etc.)
Abdominal Pain		YES	YES	YES	YES	
Bleeding		YES	YES	YES		
Constipation			YES	YES	YES	YES
Drowsiness				YES	YES	YES
Edema		YES	YES	YES		
Headache			YES	YES	YES	
Hypertension				YES		
Liver Damage	YES (in higher doses)			YES	YES	
Mental Status Changes		YES			YES	YES
Nausea, Vomiting		YES	YES	YES	YES	YES
Skin Rash or Persistent Itching		YES	YES	YES	YES	YES
Urinary Retention					YES	YES
Xerostomia (dry mouth)					YES	
Withdrawal symptoms if the patient is on other opioids					Possible	Possible

Table 7.3. Side Effects of Common Pain Medications (con't)

	Anti-Arrhythmics (Mexiletine /Mexitil®)	Antidepressants (Amitryptiline /Elavil®, Nortryptiline /Pamelor®, Doxepin /Sinequan® etc.)	Steroids (Prednisone, Dexamethasone, etc.)	Anticonvulsants (antiepileptics)		
				Carbamazepine /Tegretol®	Gabapentine /Neurontin®	Valproic acid (Depacote ® etc.)
Abdominal Pain	YES		YES	YES		YES
Bleeding				YES		YES
Constipation	YES	YES		YES		
Drowsiness		YES		YES	YES	YES
Edema			YES	YES	YES	
Headache			YES	YES		
Hypertension			YES	YES		YES
Mental Status Changes	YES	YES	YES	YES		
Nausea, Vomiting	YES			YES		YES
Skin Rash or Persistent Itching	YES			YES	YES	
Urinary Retention		YES		YES		
Xerostomia (dry mouth)		YES				

Source: Data from Physicians Desk Reference, Brunton et al.DiPiro et al.

The Pain Process:

Pain basically results from a series of exchanges involving three major components:

- The peripheral nerves
- Spinal cord
- Brain.

The Pain Process:

- Transduction: the activation of pain receptors; the conversion of painful stimuli into electrical impulses that travel to the spinal cord.
- Transmission of pain stimuli: pain sensations are conducted along pathways.
- Modulation of pain: the sensation of pain appears to be regulated or modified by neuromodulators.
- Perception of pain: involves the sensory process when a stimulus for pain is present.

Substances that Stimulate Nociceptors:

- Bradykinin: a powerful vasodilator that increases capillary permeability and constricts smooth muscle. Plays a role in chemistry of pain at site of injury.
- Prostaglandins: Hormone-like substances that send additional pain stimuli to CNS.
- Substance P: Believed to act a stimulant at pain receptors site and may influence inflammatory responcse.

Neuromodulators that decrease pain intensity:

- Endorphins.
- Enkephalins.
- Dynorohin.

Theories of Pain

- **<u>1- Specificity theories</u>**
- Specificity theories consider pain as an independent sensation with specialized peripheral sensory receptors [nociceptors], which respond to damage and send signals, through pathways (along nerve fibers) in the nervous system to target centers in the brain. These brain centers process the signals to produce the experience of pain.

Theories of Pain

- **2- Pattern theories:**

- The pattern theories were developed because of the problems encountered in the specificity theory. The pattern theory includes the peripheral pattern theory, the central summation theory, and sensory interaction theory.

Theories of Pain

- **A - Peripheral Mechanisms**

- Skin, muscle, bone and other tissues have thousands of nerve ends within a single millimeter. When stimulated these nerves generate electrical signals [action potentials], which travel at various speeds along nerve fibers to the spinal cord and brain. It can take a few seconds for these signals to generate an experience of ‘pain’ or to produce an appropriate physiological and/or behavioral response e.g. a ‘cry’ and / or withdrawal of the affected limb.

Theories of Pain

- **B -The central summation theory**

- Focuses on the dorsal horn of the spinal cord. This theory proposes that stimulation of the peripheral sensory nerves in turn stimulates specific areas in the dorsal horn then; this stimulation of these areas is interpreted as pain.

Theories of Pain

- **C - Sensory interaction theory**

- Proposes that there are two types of neurologist fibers involve in pain, small and large fibers. The small fibers carry nerve impulses patterns that produce pain and the large fibers inhibit the pain impulses .When the number of fibers that carry the pain impulses outnumber the inhibitory fibers, pain results.

Theories of Pain

- **Gate control Theory**

- It is hypothesizes an alteration in the transmission of the ascending pain signal by spinal gating mechanism located in the dorsal horn ,the pain signal may be inhibited or facilitated by multiple variables.
- The gating mechanism allows activity in large diameter fibers to inhibit transmission (close the gate);and small diameter fibers tend to facilitate transmission (open the gate).These large diameter ,rapidly conducting fibers could activate cognitive processes that would subsequently modulate the pain experience via descending fibers .
- This theory also suggests that "higher central nervous system activities, such as anxiety, past experience, attention, and the meaning of the situation, can influence the opening or closing of the gate .

General categories of pain with some examples of causes

1 - Acute pain.

May last for a brief period up to period of 3 months.

General categories of pain with some examples of causes

2 - Chronic Pain

If it persists more than 3 or 6 months, or longer and interferes with normal functioning.

- **Chronic pain not associated with malignant disease.**
- **Chronic pain associated with malignant disease.**
- **Pain associated with other progressive, potentially life – ending disease**

General categories of pain with some examples of causes

Acute pain:

- Postsurgical pain.
- Pain due to medical procedures.
- Post – trauma pain.

General categories of pain with some examples of causes

Chronic pain not associated with malignant disease:

- Pain from ongoing tissue injury.
- Ongoing pain not associated with known ongoing tissue injury.
- Pain that continues despite diminution of initial etiology.

General categories of pain with some examples of causes

Common chronic nonmalignant pain syndromes:

- Diffuse joint pain.
- Chronic low back pain.
- Failed back syndrome.
- Headache.
- Myfascial pain syndrome.
- Fibromyalgia.
- Neuropathic pain.
- Phantom limb pain.
- Central pain syndromes.
- Arthritdites.

General categories of pain with some examples of causes

Chronic pain associated with malignant disease:

- Pain due to cancer or its therapy.

General categories of pain with some examples of causes

Pain associated with other progressive, potentially life – ending disease such as:

- AIDS.
- End-stage organ system failure.
- Congestive heart failure.

General categories of pain with some examples of causes

Pain associated with degenerative neurological disease.

- Multiple sclerosis.
- Amyotrophic lateral sclerosis.

Characteristic	Acute pain	Chronic nonmalignant pain	Chronic malignant pain
Duration	Hours to days	Months to years	Unpredictable
Associated pathology	Present	Often little or none	Usually present
Prognosis	Predictable	Unpredictable	Increasing pain with possibility of disfigurement and fear of dying
Associated problems	Uncommon	Depression, anxiety, secondary gain issues	Many, especially fear of loos of control
Nerve conduction	Rapid	Slow	Slow
Autonomic nervous system involvement	Present	Cenerally absent	Present or absent
Biologic value	High	Low or absent	Low
Social effects	Minimal	Profound	Variable, usually profound
Treatment	Primary analgesics	Multimodal; often largely behavioral' drugs may play a moderate adjunctive role	Multimodal' drugs usually play a major role

General categories of pain with some examples of causes

Referred Pain (projected pain)

- Felt at other site than injured-area.
- Dermatome (skin represented by nerve root)
- Myotome (muscle innovated by nerve root)
- Sclerotome (bones innovated by nerve root)

Developmental characteristics of children's responses to pain

Young Infant

- Generalized body response of rigidity or thrashing, possibly with local reflex withdrawal of stimulated area.
- Loud crying
- Demonstrates no association between approaching stimulus and subsequent pain.
- Facial expression of pain (brows lowered and drawn together, eyes tightly closed, and mouth open and squarish) .

Facial expression of pain (brows lowered and drawn together, eyes tightly closed, and mouth open and squarish) .

Facial expression of physical distress and pain in the infant

Developmental characteristics of children's responses to pain

- **Older Infant**
- Localized body response with deliberate withdrawal of stimulated area.
- Loud crying.
- Facial expression of pain or anger (same facial characteristics as pain but eyes are open).
- Physical resistance, especially pushing the stimulus away after it is applied.

Developmental characteristics of children's responses to pain

Young child

- Loud crying, screaming
- Verbal expression of "Ow," "Ouch," "It hurts"
- Thrashing of arms and legs.
- Attempts to push stimulus away before it is applied.
- Uncooperative; needs physical restraint
- Requests termination of procedure.
- Clings to parent, nurse, or other significant person.
- Requests emotional support, such as hugs or other forms of physical comfort.
- May become restless and irritable with continuing pain.
- All of these behaviors may be seen in anticipation of actual painful procedure.

Developmental characteristics of children's responses to pain

- **School-age child**
- May see all behaviors of young child, especially during painful procedure but less in anticipatory period.
- Stalling behavior, such as "Wait a minute" or "I'm not ready".
- Muscular rigidity, such as clenched fists, white knuckles gritted teeth, contracted limbs, body stiffness, closed eyes, wrinkled forehead.

Developmental characteristics of children’s responses to pain

- **Adolescent**
- Less vocal protest.
- Less motor activity .
- More verbal expressions, such as “It hurts” or “You’re hurting me".
- Increased muscle tension and body control.

Parent behaviors in response to painful condition:

- Primary focus on additional medical consultations and diagnostic investigations.
- Persistent search for environment triggers.
- Failure to resolve continuing sources of stress.

Factors affecting pain experience

- **1 - Age :**
- **2 - Sex differences**
- **3- Presence of others or absence of family member:**
- **4 -Birth order**
- **5- Cause of pain**
- **6-Situational factors**
- **7– Emotions & Degree of anxiety:**
- **8-Cultural \ethnic values**

- Other factors influencing a child's experience of pain are the severity, duration, location, degree of immobility imposed, the body part involved, and the past experience.

Assessment of pain

- To appropriate pain diagnosis can be made.
- Should be ongoing (occurring at regular intervals).
- Individualization
- Documentation
- To clear understanding of the pain problem.

Initial pain assessment:

- Obtain a detailed history, including an assessment of the pain characteristics and intensity.
- Conduct a physical examination, emphasizing the neurological and musculoskeletal examination.
- Obtain a psychosocial assessment.
- Provide an appropriate diagnostic work-up to determine the cause of pain.

ABCDE of pain management and assessment:

- Ask about pain regularly. Assess pain systematically.
- Believe the patient and family in their reports of pain an what relieves it.
- Choose pain control options appropriate for the patient, family and setting.
- Deliver intervention in timely, logical and coordinated fashion.
- Empower patients and their family. Enable them to control their course to the greatest extent possible. Pain relief should be human right.

Characteristics of pain (PORST)

1- Palliative/Provocative factors of pain
- Aggravating factors
- Alleviating factors

2- Quality of pain
- Encourage the patient to describe his/her pain

3- Radiation (Location) of pain:
- Instruct the patient to point the area of pain

4- Severity of pain
- Since pain is subjective, it is very important to have patients rate the pain they are experiencing. This becomes extremely important when assessing the effectiveness of pain medications.

5- Time of pain
- Duration

Pain Assessment Tools :

Pain Assessment Instruments for Children

1. Pain Experience History

2. Eland Color Scale Figures

3. Poker Chip Tool Instructions Sheet

4. Word-Graphic Rating Scale

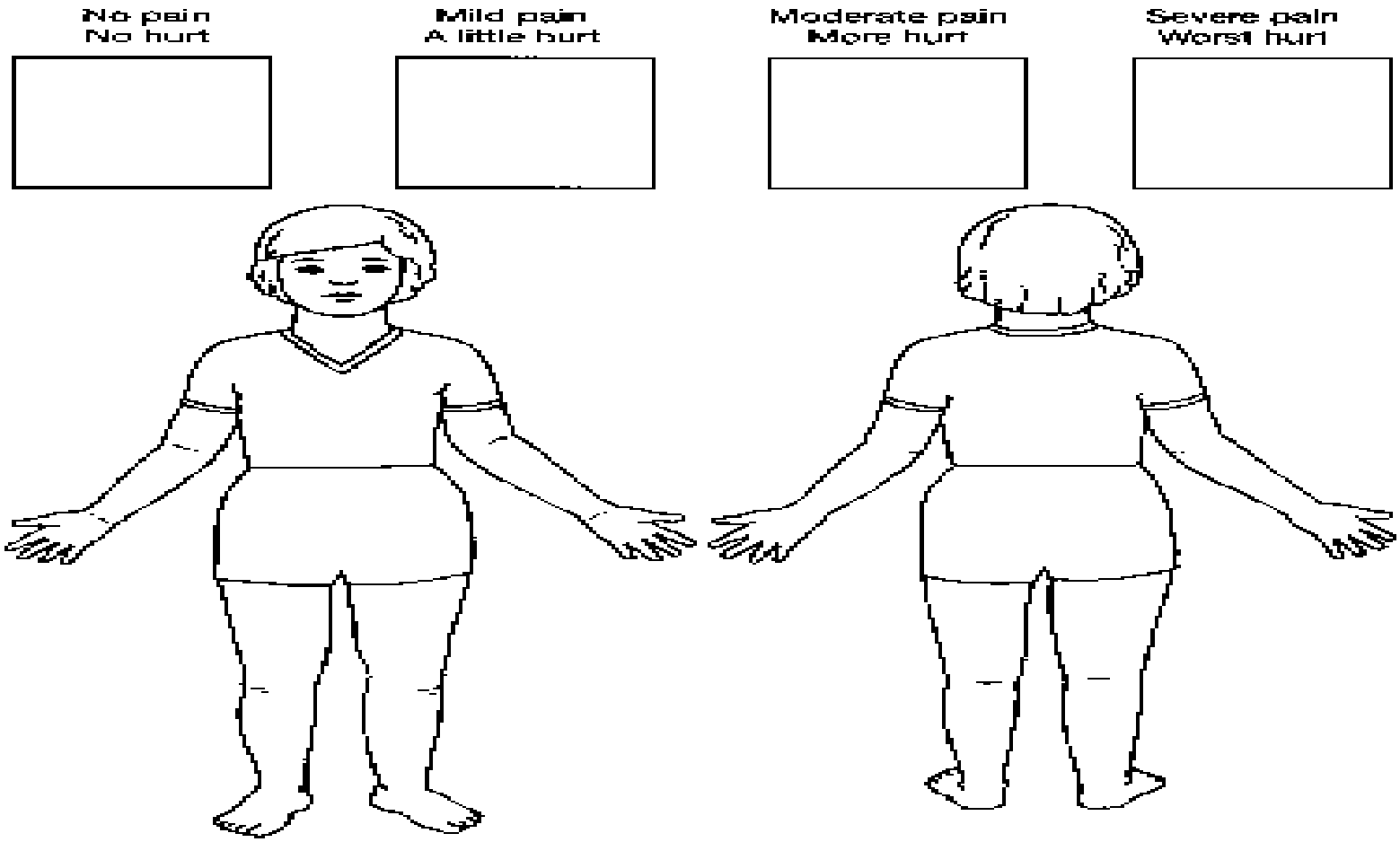
5. Pain Affect Faces Scale

1. Pain experience history

Child form	Parent form
Tell me what pain is.	What word(s) does your child use in regard to pain?
Tell me about the hurt you have had before.	Describe the pain experiences your child has had before.
Do you tell others when you hurt? If yes, who?	Does your child tell you or others when he/she is hurting?
What do you do for yourself when you are hurting?	How do you know when your child is in pain?
What do you want others to do for you when you hurt?	How does you child usually react to pain?
What don't you want others to do for you when you hurt?	What do you do for your child when he/she is hurting?
What helps the most to take your hurt away?	What does your child do for him/herself when he/she is hurting?
Is there anything special that you want me to know about you when you hurt? (If yes, have child describe.)	What works best to decrease or take away your child's pain?
	Is there anything special that you would like me to know about your child and pain? (If yes, describe.)

Adapted with permission from Hester and Barcus, 1986.

2. Eland Color Scale: Directions for Use



3. Poker Chip Tool Instruction Sheet

- After discussing with the child several things that have hurt the child in the past:
- Present eight crayons or markers to the child. Suggested colors are yellow, orange, red, green, blue, purple, brown, and black.
- Ask the following questions, and after the child has answered, mark the appropriate square on the tool (e.g., severe pain, worst hurt), and put that color away from the others. For convenience, the word hurt is used here, but whatever term the child uses should be substituted. Ask the child these questions:
  - "Of these colors, which color is most like the worst hurt you have ever had, (using whatever example the child has given) or the worst hurt anybody could ever have?" Which phrase is chosen will depend on the child's experience and what the child is able to understand. Some children may be able to imagine much worse pain than they have ever had, while other children can only understand what they have experienced. Of course, some children may have experienced the worst pain they can imagine.
  - "Which color is almost as much hurt as the worst hurt (or, use example given above, if any), but not quite as bad?"
  - "Which color is like something that hurts just a little?"
  - "Which color is like no hurt at all?"

3. Poker Chip Tool Instruction Sheet

- Show the four colors (marked boxes, crayons, or markers) to the child in the order he has chosen them, from the color chosen for the worst hurt to the color chosen for no hurt.
- Ask the child to color the body outlines where he hurts, using the colors he has chosen to show how much it hurts.
- When the child finishes, ask the child if this is a picture of how he hurts now or how he hurt earlier. Be specific about what earlier means by relating the time to an event, e.g., at lunch or in the playroom.
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4. Word-Graphic Rating Scale

- "This is a line with words to describe how much pain you may have. This side of the line means no pain and over here the line means worst possible pain." (Point with your finger where "no pain" is, and run your finger along the line to "worst possible pain," as you say it.) "If you have no pain, you would mark like this." (Show example.) "If you have some pain, you would mark somewhere along the line, depending on how much pain you have." (Show example.) "The more pain you have, the closer to worst pain you would mark. The worst pain possible is marked like this." (Show example.)

Example

- "Show me how much pain you have right now by marking with a straight, up and down line anywhere along the line to show how much pain you have right now."

|_____|No

Little pain | Medium pain | Large possible | Worstpain | pain

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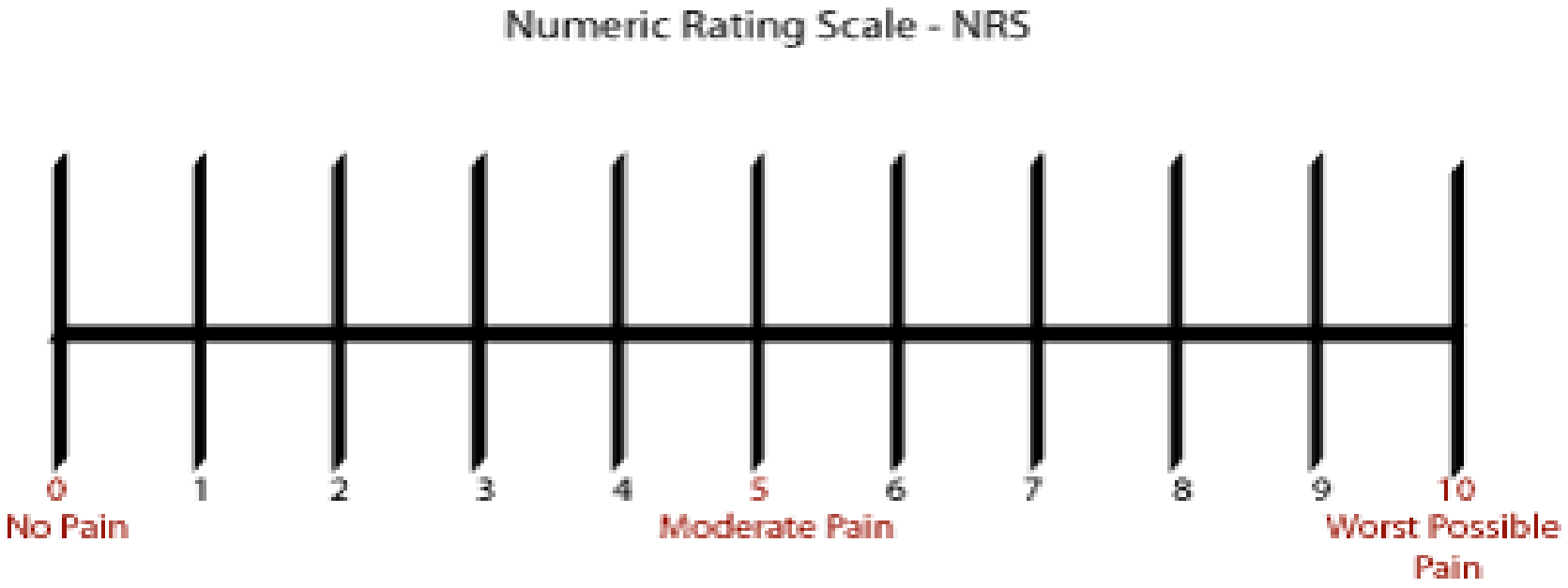
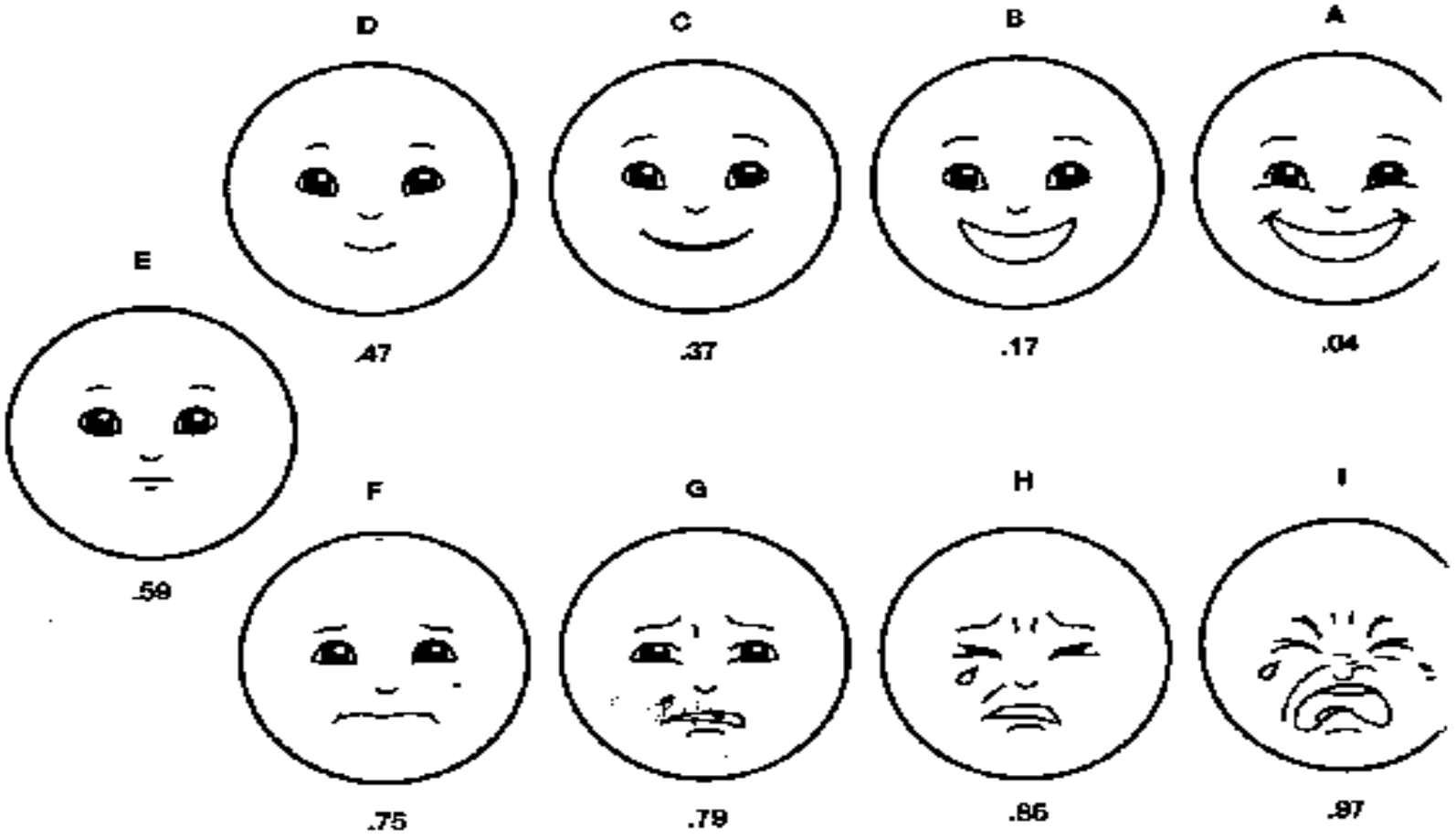
Numerical Scale

- Please point to the number that best describes your pain.



5. Pain Affect Faces Scale



5. Pain Affect Faces Scale

- Children are presented with one of three different randomly ordered face sheets. They select the face that best represents how they feel in relation to their pain conditions from "the happiest feeling possible" to the "saddest feeling possible." This figure is actually the scoring card used to quantify children's responses. The numbers represent the magnitude of pain affect (between 0 and 1) shown in each face, based on previous research on children.

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Other Pain Face Scale

	Scale	
No pain	0	
	1	
Mild, annoying pain	2	
	3	
Nagging, uncomfortable, troublesome pain	4	
	5	
Distressing, miserable pain	6	
	7	
Intense, dreadful, horrible pain	8	
	9	
Worst possible, unbearable, excruciating pain	10	

Instruments for Pain Management Documentation

1. Pain Management Log
2. Flowsheet for Pain Management Documentation

Use of Behavioral Pain Assessment Tools

- FLACC: Faces, Legs, Activity, Cry, Consolability Observational Tool (Manworren & Hynan, 1995; Merkel et al.,1997; Willis et al., 2003)
- (tested in 2 months to 7 years of age; Post Anesthesia Care, intensive care, acute care settings, surgical pain and acute pain)

	Scoring		
Categories	**0**	**1**	**2**
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

Note: Each of the five categories Face (F), Legs (L), Activity (A), Cry (C), and Consolability (C) is scored from 0-2, which results in a total score between 0 and 10.

From Merkel, Voepel-Lewis, Shayevitz, & Malviya (1997). The FLACC: A behavioral scale for scoring postoperative pain in young children. *Pediatric Nursing, 23*(3) 293-297.

Use of Behavioral Pain Assessment Tools

- CHEOPS
- Children's Hospital of Eastern Ontario Pain Scale (McGrath et al., 1985) (tested in 1 to 5 years of age; Post Anesthesia Care Unit, surgical pain)

Category	Descriptor	Score
Physiological data		
a)	Physiological data within reference range	0
b)	Dilated pupils	2
c) *Choose only one:*	Percentage increase in heart rate relative to baseline	
	>20%	1
	>50%	2
	>100%	3
d) *Choose only one:*	Percentage increase in respiratory rate relative to baseline	
	>20%	1
	>50%	2
	>100%	3
e) Rectal temperature exceeds reference range		1
d) Salivation		2
Response to palpation		
a) *Choose only one:*	No change from preprocedural behavior	0
	Guards/reacts[a] when touched	2
	Guards/reacts[a] before touched	3
Activity		
a) *Choose only one:*	At rest- sleeping or semiconscious	0
	At rest- awake	1
	Eating	0
	Restless (pacing/getting up and down)	2
	Rolling, thrashing	3
Posture		
a)	Guarding or protecting affected area (includes fetal position)	2
b) *Choose only one:*	Lateral recumbency	0
	Sternal recumbency	1
	Sitting/standing, head up	1
	Standing, head hanging down	2
	Moving	0
	Abnormal posture (prayer position, hunched)	2
Vocalization[b]		
a) *Choose only one:*	Not vocalizing	0
	Vocalizing when touched	2
	Intermittent vocalization	2
	Continuous vocalization	3
Mental status		
a) *Choose only one:*	Submissive	0
	Overtly friendly	1
	Wary	2
	Aggressive	3

[a]Turning head toward affected area, biting, licking, scratching at the wound; snapping at handler; or tense muscles and a protective (guarding) posture.
[b]Does not include alert barking.

Melbourne score **4**

Use of Behavioral Pain Assessment Tools

- COMFORT Behavior Scale (van Dijk et al., 2000, 2005) (tested in neonate to 3 years of age; intensive care setting, surgical pain. Revised scale of COMFORT (Ambuel et al., 1992; Canenvale, & Razack, 2002) measures other constructs than pain (tested in newborn to 9 years of age, intensive care setting, mechanically ventilated).

		Obs1	Obs2	Obs3	Obs4	Obs5	Obs6
	Date						
	Time						
ALERTNESS	1						
Deeply asleep	2						
Lightly asleep	3						
Drowsy	4						
Fully awake & alert	5						
Hyper-alert							
CALMNESS/AGITATION	1						
Calm	2						
Slightly anxious	3						
Anxious	4						
Very anxious	5						
Panicky							
RESPIRATORY RESPONSE	1						
No coughing and no spontaneous respiration	2						
Spontaneous respiration, minimal response to vent	3						
Occasional cough or resistance to vent	4						
Actively breathes against ventilator or coughs regularly	5						
Fights ventilator coughing or choking							
PHYSICAL MOVEMENT	1						
No spontaneous movement	2						
Occasional, slight movement	3						
Frequent, slight movement	4						
Vigorous movement in extremities only	5						
Vigorous movement including torso and head							
MEAN ARTERIAL PRESSURE (see reverse)		LO/B/HI	LO/B/HI	LO/B/HI	LO/B/HI	LO/B/HI	LO/B/HI
LO<_____ Baseline_____>HI		__/__/	__/__/	__/__/	__/__/	__/__/	__/__/
Any observation LO	1	—	—	—	—	—	—
All 6 observations within baseline range	2						
1-3/6 observations HI	3						
4-5/6 observations HI	4						
All 6 observations HI	5						
HEART RATE (see reverse)							
LO<_____ Baseline_____>HI		LO/B/HI	LO/B/HI	LO/B/HI	LO/B/HI	LO/B/HI	LO/B/HI
Any observation LO	1	__/__/	__/__/	__/__/	__/__/	__/__/	__/__/
All 6 observations within baseline	2	—	—	—	—	—	—
1-3/6 observations HI	3						
4-5/6 observations HI	4						
All 6 observations HI	5						
MUSCLE TONE	1						
Totally relaxed, no tone	2						
Reduced tone	3						
Normal tone	4						
Increased tone with flexion of fingers and toes	5						
Extreme rigidity and flexion of fingers and toes							
FACIAL TENSION	1						
Facial muscles totally relaxed	2						
Facial muscle tone normal, no tension evident	3						
Tension evident in some facial muscles	4						
Tension evident throughout facial muscles	5						
Facial muscles contorted and grimacing							
TOTAL							

- PIPP: Premature Infant Pain Profile (Stevens, 1996)
- (tested in premature and term neonates; neonatal settings, procedural pain)

Table V – Premature Infant Pain Profile (PIPP)

Indicators	0	1	2	3
GA in weeks	≥ 36 weeks	32 to 35 weeks and 6 days	28 to 31 weeks and 6 days	< 28 weeks
Observe the NB for 15sec				
Alertness	Active Awake Opened eyes Facial movements present	Quiet Awake Opened eyes No facial movements	Active Sleep Closed eyes Facial movements present	Quiet Sleeping Closed eyes No facial movements
Record HR and SpO_2				
Maximal HR	↑ 0 to 4 bpm	↑ 5 to 14 bpm	↑ 15 to 24 bpm	↑ ≥ 25 bpm
Minimal Saturation	↓ 0 to 2.4%	↓ 2.5 to 4.9%	↓ 5 to 7.4%	↓ ≥ 7.5%
Observe NB for 30 sec				
Frowned forehead	Absent	Minimal	Moderate	Maximal
Eyes squeezed	Absent	Minimal	Moderate	Maximal
Nasolabial furrow	Absent	Minimal	Moderate	Maximal

Absent is defined as 0 to 9% of the observation time; minimal, 10% to 39% of the time; moderate, 40% to 69% of the time; and maximal as 70% or more of the observation time. In this scale, scores vary from zero to 21 points. Scores equal or lower than 6 indicate absence of pain or minimal pain; scores above 12 indicate the presence of moderate to severe pain.
GA – Gestational Age. NB – Newborn.

Guidelines for preparing children for procures procedures:

- Be honest
- Explain the procedure
- Emphasize the qualitative sensations .
- Focus attention on what you and child can do to make the procedure less distressing
- Choice, control, and predictability
- It is important to follow you child's Preferences.
- After the procedure is over praise your child for coping.

Ethical Tenets

- Providing quality and comparable care to all patients, including those individuals who are vulnerable and unable to speak for themselves.
- Respect for human dignity, the first principle in the "Code of Ethics for Nurses" (ANA, 2001).
- Directs nurses to provide and advocate for humane and appropriate care.
- The care is given with compassion and unrestricted by consideration of personal attributes, economic status, or the nature of the health problem.

The nursing philosophy of pain management

- This is what nurses at the Clinical Center believe when they care for patients in pain:

1. I care.
2. I believe your pain is real.
3. I understand your pain makes you act certain ways.
4. I want to talk to you about what you think will help your pain.
5. I want to discuss with you what your pain means to you.
6. I am willing to stay with you, even if I cannot help relieve your pain.
7. If you do not feel comfortable with me as a care giver, I will try to find someone else for you.

Management of pain: Pharmacological management:

1- Non-narcotic analgesics (aspirin, Tylenol, NSAIDS)

- Used fro mild to moderate pain.
- Works best on muscle and joint pain.
- Produces analgesia at the peripheral nervous system.
- Major side-effects- Nausea, vomiting, increased bleeding tendencies.

Management of pain:
Pharmacological management:

2- Narcotic analgesic (morphine, codiene, Demerol)

- Used for severe pain.
- In sufficient dose, considered capable of relieving pain , in most cases.
- Analgesia produced at the central nervous system.
- Major side-effect: Respiratory depression, sedation.

Management of pain:
Pharmacological management:

3- Other medications (antidepressants, anticonvulsants):

- Used usually in combination with opioids especially when there is a neurological component as one of the pain.
- Mechanism of action not clearly understood, may block pain transmission or may suppress abnormal nerve endings from injury to nerve tissue (anticonvulsant).

Non-pharmacologic relief measures:
I) Cutaneous Stimulation:

1. Classical massage.

2. Counter stimulation.

3. Heat therapy.

4. Transelectrical nerve stimulation (TENS).

Non-pharmacologic relief measures: II) Cognitive behavior therapy:

1. Breathing exercise.
2. Progressive relaxation technique.
3. Distraction technique.

Non-pharmacologic relief measures: III) Others:

- Spiritual therapy.
- Nutritional therapy.

Nonpharmacologic satieties for pain management General strategies

- Use nonphamacologic interventions to supplement, not replace, pharmacologic interventions, and use for mild pain and pain that is reasonably with analgesics.
- Form a trusting relationship with child and family.
- Excess concen regarding their reports of pain and intervene appropriately.
- Take an active role in seeking effective pain management strategies.
- Use general guidelines to prepare child for procedure.
- Prepare child before potentially painful procedures but avoid" planting" the idea of pain.
- For example, instead of saying, "this is going to (or may) hurt, "say, "sometimes this fells like pushing, sticking, or pinching, and sometimes it doesn't bother people. Tell me what it fells like to you.' Use "nonpain" descriptors when possible (e.g., its feels like heat" rather than "it's a burning pain"). This allows for variation in sensory perception, avoids suggesting pain, and gives the child control in describing reactions.
- Avoid evaluative statements or descriuptions (e.g.' "this is a terrible procedure" or "it really will hurt a lot").

Nonpharmacologic satieties for pain management

- Stay with child during a painful procedure.
- Allow parents to stay with child if child and parent desire' encourage parent to talk softly to child and to remain near child's head.
- Involve parents in learning specific nonphamacologic strategies and in assisting child with their use.
- Educate child about the pain, especially when explanation may lessen anxiety (e.g., that pain may occur after surgery and does not indicate something is wrong); reassure the child that he or she is not responsible for the pain.
- for long tern pain control, give child a doll, which rep[resents "the patient' and allow child to do everything to the dol that is done to the child better after the medicine."
- Teach procedures to child and family for later use.

Nonpharmacologic satieties for pain management Specific strategies

Distraction

- Involve parent and child in identifying strong distractors.
- Involve child in play; use radio, tape recorder, CD player or computer game; have child sing or use rhythmic breathing.
- Have child take a deep breath and blow it out until told to stop.
- Have child blow bubbles to “blow the hurt away.”
- Have child concentrate on yelling or saying “ouch” with instructions to “yell as loud or soft as you feel it hurt; that way I know what’s happening.’
- Have child look thought kaleidoscope (type with glitter suspended in fluidfilled tube) and encourage him or her to concentrate by asking, “do you see the different designs?”
- Use humor, such as watching cartoons, telling jokes or funny stories , or acting silly with child.
- Have child read, play games , or visit with friends.

Nonpharmacologic satieties for pain management
Specific strategies

Relaxation:

- **With an infant or young child:**
- Hold in a comfortable, well-supported position, such as vertically against the chest and shoulder.
- Rock in a wide4, rhythmic arc in a rocking chair or sway back and forth, repeat one or two words softy, such as “mommy’s here”.
- **With a slightly older child:**
- Ask child take a deep breath and “g limp as a rag doll” while exhaling slowly; then ask child to yawn (demonstrate if needed).
- Help child assume a comfortable position (e.g., pillow under neck and knees).
- Begin progressive relaxation: starting with the toes, systematically instruct child to let each body part “go limp” or “feel heavy”;if child has difficulty relaxing, instruct child to tense or tighten each body part and then relax it.
- Allow child to keep eyes open, since children may respond better if eyes are open rather than closed during relaxation.

Nonpharmacologic satieties for pain management Specific strategies

Guided imagery:

- Have child identify some highly pleasurable real or imaginary experience.
- Have child describe details of the event, including as many senses as possible (*.g.,”feel the cool breezes,” “see the beautiful colors,” hear the peasant music”)
- Have child write don or tape record script.
- Encourage child to concentrate only on the pleasurable event during the painful time; enhance the image by recalling specific details through reading the script or playing the tape.
- Combine with relaxation and rhythmic breathing.

Nonpharmacologic satieties for pain management
Specific strategies

Thought stopping:

- Teach child positive statements to say when in pain (e.g., “I will b3e feeling better soon,” when I go home, I will feel better, and we will eat ice cream”.
- Identify positive facts about the painful event (e.g., “it does not last long”).
- Identify reassuring information (e.g., if I think about something else, it does not hurt as much”).
- Condense positive and reassuring facts into a set of brief statements and have child memorize them (e.g., “short procedure, good veins, little hurt, mice nurse, go home”).
- Have child repeat the memorized statements whenever tinking about or experiencing the painful event.

Behavioral contracting:

Informal-may be used with children as young as 4 or 5 years of age:

- Use stars, tokens, or cartoon character stickers as rewards.
- Give a child who is uncooperative or procrastinating during a procedure a limited time (measured by a visible timer) to completed the procedure.
- Proceed as needed if child is unable to comply.Reinforce cooperation with a reward if the procedure is accomplished within specified time.

Behavioral contracting:

Formal-use written contract, which includes:

- Realistic (seems possible) goal or desired behavior
- Measurable behavior (e.g., agrees not to hit anyone during procedures) contract written, dated, and signed by all persons involved any of the agreements.
- Identified rewards or consequences that are reinforcing goals that can be evaluated
- Commitment and compromise requirements for both parties (e.g., while timer is used, nurse will not nag or prod child to complete procedure).

Management of specific types of pain in children:

- **Postoperative pain**
- **Trauma and burns**
- **Cancer and palliative care**
- **Brief diagnostic and therapeutic procedures**
- **Sickle cell anaemia**
- **HIV/AIDS**
- **Neuropathic pains**
- **Chronic ‘benign’ pains of childhood**

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Thank you