

# Perioperative pain management

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# Disclosures

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- No disclosures

# Objectives

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- Definition of pain
- Classification
- Consequences of unrelieved pain
- Pain assessment tools
- Acute pain treatment

# Importance of the subject

DEBATE

Open Access

## Access to pain treatment as a human right

Diederik Lohman, Rebecca Schleifer, Joseph J Amon\*

### Abstract

**Background:** Almost five decades ago, governments around the world adopted the 1961 Single Convention on Narcotic Drugs which, in addition to addressing the control of illicit narcotics, obligated countries to work towards universal access to the narcotic drugs necessary to alleviate pain and suffering. Yet, despite the existence of inexpensive and effective pain relief medicines, tens of millions of people around the world continue to suffer from moderate to severe pain each year without treatment.

**Discussion:** Significant barriers to effective pain treatment include: the failure of many governments to put in place functioning drug supply systems; the failure to enact policies on pain treatment and palliative care; poor training of health care providers; and inequities among health care systems. These barriers impede pain treatment. The result is that millions of people are suffering but not receiving the care they need.

**Summary:** Access to pain treatment is a part of their right to health. People who suffer pain have a right to relief from that pain. It is a cruel, inhumane, and

**Revision of the International Classification of Diseases (ICD-11)**

Chronic pain affects an estimated 20 percent of people worldwide and accounts for nearly one-fifth of physician visits. One way to ensure that chronic pain receives greater attention as a global health priority is to improve the International Classification of Diseases (ICD) diagnostic classification.

In response to this need, IASP created an international task force of pain experts headed by past president Rolf-Detlef Treede that, in close cooperation with the World Health Organization (WHO), has developed a proposal for a systematic and pragmatic classification of chronic pain. This new classification of chronic pain has been implemented in the ICD-11 frozen version for preparing implementation. The ICD-11 was approved on May 25, 2019. It will come into effect on January 1st, 2022.





# Surgical patients: who are they?



# Pain: definition

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”Pain is an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms.”

# Pain: definition

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”Pain is an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms.”

# Pain: classification

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## I. by timescale:

- acute
- subacute
- chronic

## II. by mechanism

- nociceptive
- neuropathic

## III. by diagnosis

- malignant
- non malignant

## IV. by intensity:

- mild
- moderate
- severe



# Acute pain: definition

Bibliography:	Year	Definition
Kroner K. [1] (1992)	1992	“Pain of <b>recent onset</b> and probable <b>limited duration</b> . It usually has an identifiable temporal and causal relationship to <b>injury</b> or <b>disease</b> .”
Eules T. [2] (1998)	1998	“The normal, predicted <b>physiological response</b> to an adverse chemical, thermal or mechanical stimulus....associated with surgery, trauma and acute illness.”
Practice Guidelines [3] (2012)	2012	“Pain that is present in a surgical patient after a procedure. Such pain may be the <b>result of trauma</b> from the procedure or procedure related complications”.

1. Kroner K., Knudsen U.B., Lundby L. et al. Long-term phantom breast syndrome after mastectomy. Clinical Journal of Pain. 1992; 8, p.346-50.

2. Eules T. Model guidelines for the use of controlled substances for the treatment of pain: Federation of State Medical Boards of the United States, 1998.

3. Practice guidelines for acute pain management in the perioperative setting: an updated report by the American Society of Anesthesiologists Task Force on Acute Pain Management. Anesthesiology. 2012; 116 (2), p.248-73.

# Acute pain after surgery

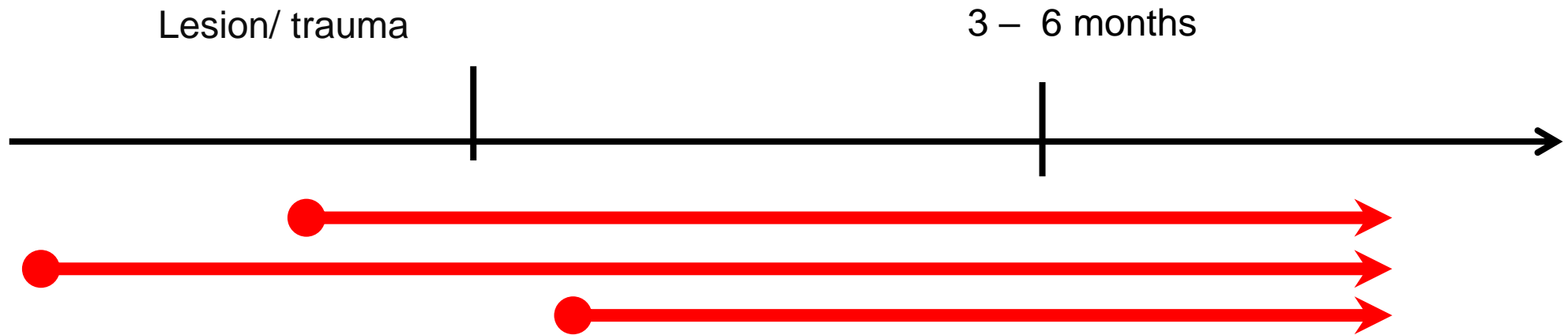
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Reference	Incidence of moderate or severe pain or insufficient analgesia (%)
Papper et al., (1952) <sup>14</sup>	33
Lasagna et al., (1954) <sup>15</sup>	33
Keeri-Szanto et al., (1972) <sup>16</sup>	20
Cronin et al., (1973) <sup>17</sup>	42
Banister (1974) <sup>18</sup>	12-26
Tammisto (1978) <sup>19</sup>	24
Cohen (1980) <sup>20</sup>	75
Donovan (1983) <sup>21</sup>	31
Owen et al., (1990) <sup>22</sup>	37
Apfelbaum et al., (2003) <sup>23</sup>	70
Sommer et al., (2008) <sup>24</sup>	41
Maier et al., (2010) <sup>25</sup>	29.6-55

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# Chronic pain: definition

Acute/ subacute/ chronic (by timescale)



# Pain: classification

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## I. by timescale:

- acute
- subacute
- chronic

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- nociceptive
- neuropathic

## III. by diagnosis

- malignant
- non malignant

## IV. by intensity:

- mild
- moderate
- severe

# Pain classification: related to tissue damage

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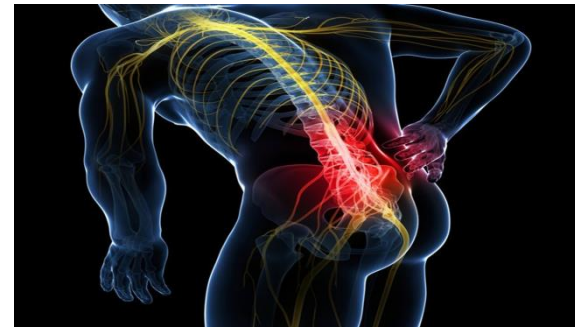
Nociceptive pain  
lesion

↓  
pain that occurs as a result of  
normally functioning nervous  
system



Neuropathic pain

↓  
damage of nerve or  
associated with dysfunction  
of the nervous system



# Pain: classification

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# Pain: classification

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# The physiological effects of unrelieved pain



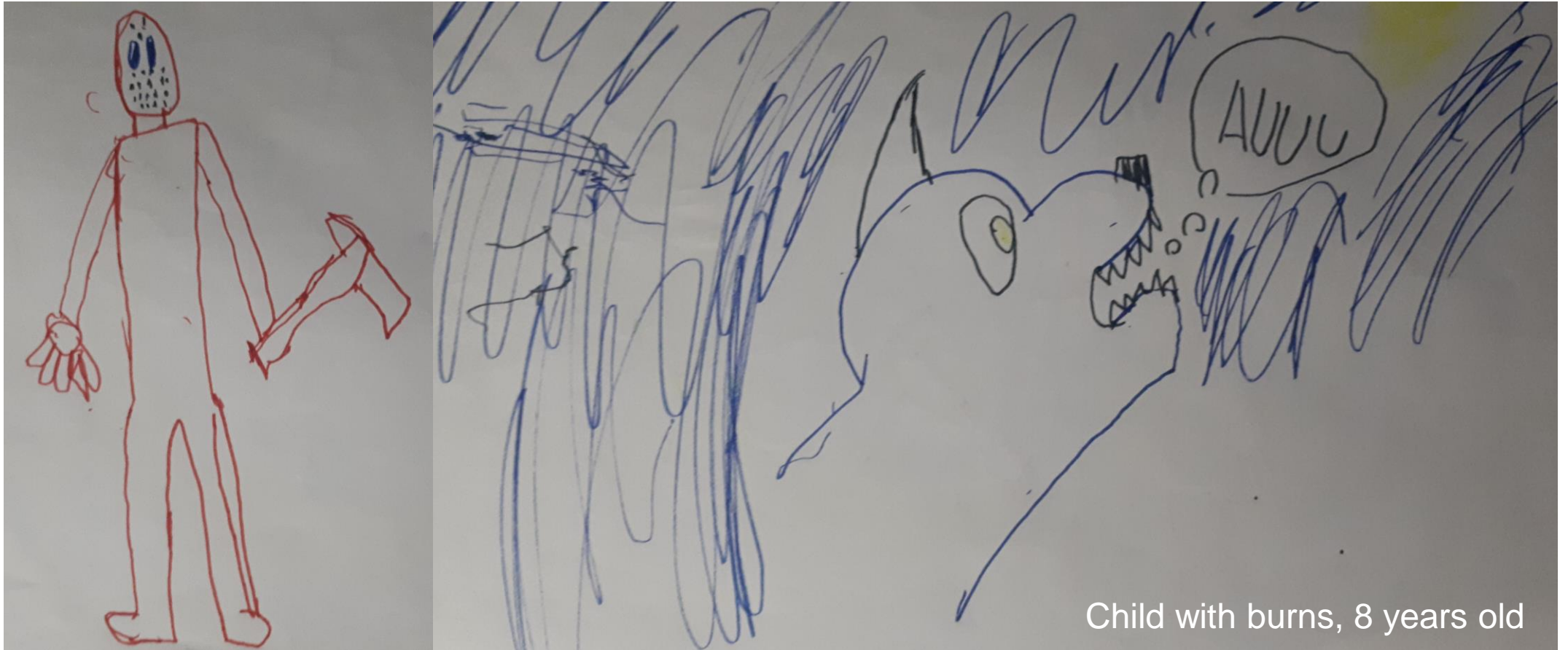
↓ flow  
↓ tidal volume  
atelectasis  
shunt

↑ HR and CO  
↑ SVR  
↑ coronary vascular  
resistance

Immunosuppression

↑ catecholamines,  
↑ cortisol, renin,  
↑ angiotensin,  
↑ aldosterone

# Emotional and cognitive effects of unrelieved pain



# How to assess the pain?

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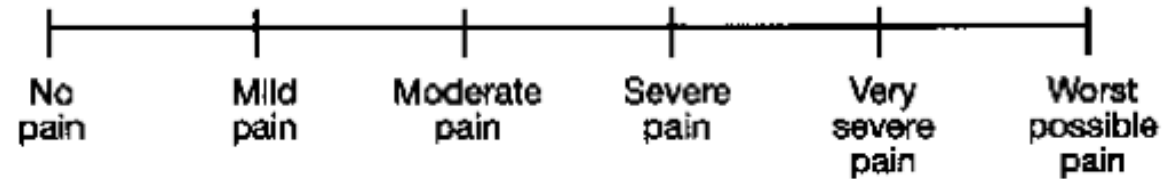
*"pain is whatever the experiencing person says it is, existing whenever he says it does".*

Margo McCaffery (1968)  
(nurse)

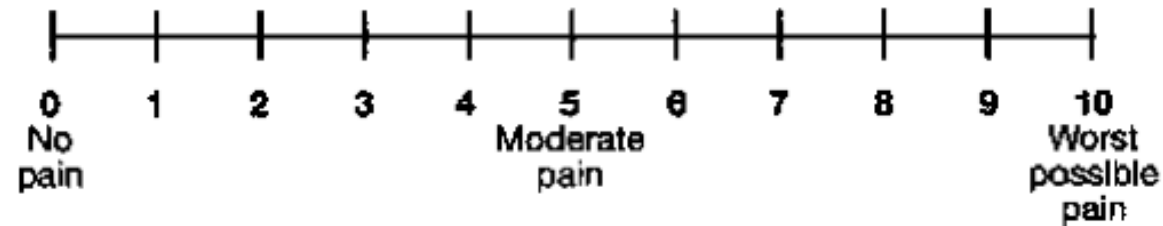
# Pain assessment tools: patient's self-report

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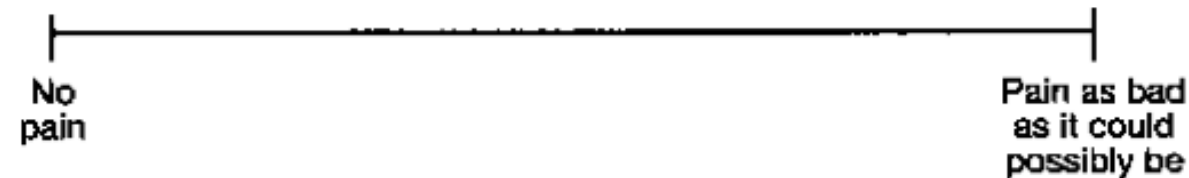
**Simple Descriptive Pain Intensity Scale<sup>1</sup>**



**0-10 Numeric Pain Intensity Scale<sup>1</sup>**



**Visual Analog Scale (VAS)<sup>2</sup>**

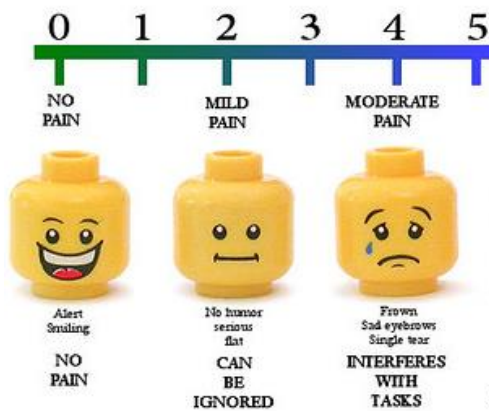


# Pain assessment tools: patient's self-report

## Wong-Baker FACES™ Pain Rating Scale



### LEGO PAIN ASSI





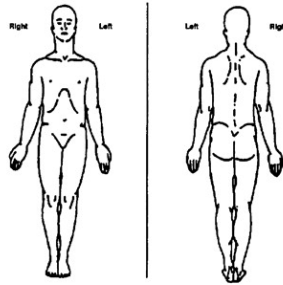
# Multidimensional pain-rating scales: The Brief Pain Inventory (BPI)

## Brief Pain Inventory (Short Form)

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

Yes  No

2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.



3. Please rate your pain by marking the box beside the number that best describes your pain at its worst in the last 24 hours.

0  1  2  3  4  5  6  7  8  9  10  
No Pain Pain As Bad As You Can Imagine

4. Please rate your pain by marking the box beside the number that best describes your pain at its least in the last 24 hours.

0  1  2  3  4  5  6  7  8  9  10  
No Pain Pain As Bad As You Can Imagine

5. Please rate your pain by marking the box beside the number that best describes your pain on the average.

0  1  2  3  4  5  6  7  8  9  10  
No Pain Pain As Bad As You Can Imagine

6. Please rate your pain by marking the box beside the number that tells how much pain you have right now.

0  1  2  3  4  5  6  7  8  9  10  
No Pain Pain As Bad As You Can Imagine

pain the patient has experienced over a 24-hr period  
15 min to complete  
Multidimensional evaluation:

- intensity and its variation
- location of pain
- treatment and its efficacy
- pain interfered with patient's life (activity, relations and sleep)

# Managing pain in special circumstances

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- Paediatrics
- The older patient
- Patients taking opioids for chronic painful conditions
- The known or suspected drug misuser
- The patient with renal dysfunction
- Day-case surgery



# Why treat pain in preterm and neonates?

THE LANCET

## Effect of neonatal circumcision on pain response during subsequent routine vaccination

Anna Taddio, Joel Katz, A Lane Ilersich, Gideon Koren

### Summary

**Background** Preliminary studies suggested that pain experienced by infants in the neonatal period may have long-lasting effects on future infant behaviour. The objectives of this study were to find out whether neonatal circumcision altered pain response at 4-month or 6-month vaccination compared with the response in uncircumcised infants, and whether pretreatment of circumcision pain with lidocaine-prilocaine cream (Emla) affects the subsequent vaccination response.

**Methods** We used a prospective cohort design to study 87 infants. The infants formed three groups—uncircumcised infants, and infants who had been randomly assigned Emla or placebo in a previous clinical trial to assess the efficacy of Emla cream as pretreatment for pain in neonatal circumcision. Infants were videotaped during vaccination done at the primary care physician's clinic. Videotapes were scored without knowledge of circumcision or treatment status by a research assistant who had been trained to measure infant facial action, cry duration, and visual analogue scale pain scores.

**Interpretation** Circumcised infants showed a stronger pain response to subsequent routine vaccination than uncircumcised infants. Among the circumcised group, preoperative treatment with Emla attenuated the pain response to vaccination. We recommend treatment to prevent neonatal circumcision pain.

insignificant, and, therefore, that the benefits of analgesic treatment do not outweigh the risks of adverse effects from currently available therapies.<sup>7,8</sup>

We looked at the foundations for the belief that the effects of circumcision pain are short-lived by examining infant behaviour several months after surgery. We analysed data from a clinical trial that studied the use of topical lidocaine-prilocaine 5% cream (Emla, Astra Pharma, Canada) during routine vaccination at 4 or 6 months.<sup>9</sup> Male infants showed a greater pain response than female infants. This difference may be linked with neonatal circumcision in male infants. Male infants who had been circumcised also exhibited a greater pain response than those who had not been circumcised.<sup>10</sup> This initial analysis raised concerns about the possible long-term effects of untreated pain in infants, especially those

- prospective, placebo controlled
- 87 infants
- 2 trials: EMLA or placebo for neonatal circumcision
- follow up at 4-6 months vaccination

# FLACC (*Faces, Legs, Activity, Cry, Consolability*)

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

- 2 months - 7 years
- non-communicant patients (4-19 years old)
- scored in a range of 0–10
- five criteria (each assigned a score of 0, 1 or 2)
- for use with adults in ICU who are unable to speak due to intubation

# PIPP (*Premature Infant Pain Profile*)

Infant Indicator	Indicator Score				Infant Indicator Score
	0	+1	+2	+3	
Change in Heart Rate (bpm) Baseline: _____	0 - 4	5 - 14	15 - 24	>24	
Decrease in Oxygen Saturation (%) Baseline: _____	0 - 2	3 - 5	6 - 8	>8 or Increase in O <sub>2</sub>	
Brow Bulge (Sec)	None (<3)	Minimal (3 -10)	Moderate (11 - 20)	Maximal (>20)	
Eye Squeeze (Sec)	None (<3)	Minimal (3 -10)	Moderate (11 - 20)	Maximal (>20)	
Naso-Labial Furrow (Sec)	None (<3)	Minimal (3 -10)	Moderate (11 - 20)	Maximal (>20)	
* Sub-total Score:					
Gestational Age (Wks + Days)	>36 wks	32 wks - 35 wks, 6d	28 wks- 31wks, 6d	<28wks	
Baseline Behavioural State	Active and Awake	Quiet and Awake	Active and Asleep	Quiet and Asleep	
** Total Score:					

- 27 wks – term
- procedural pain

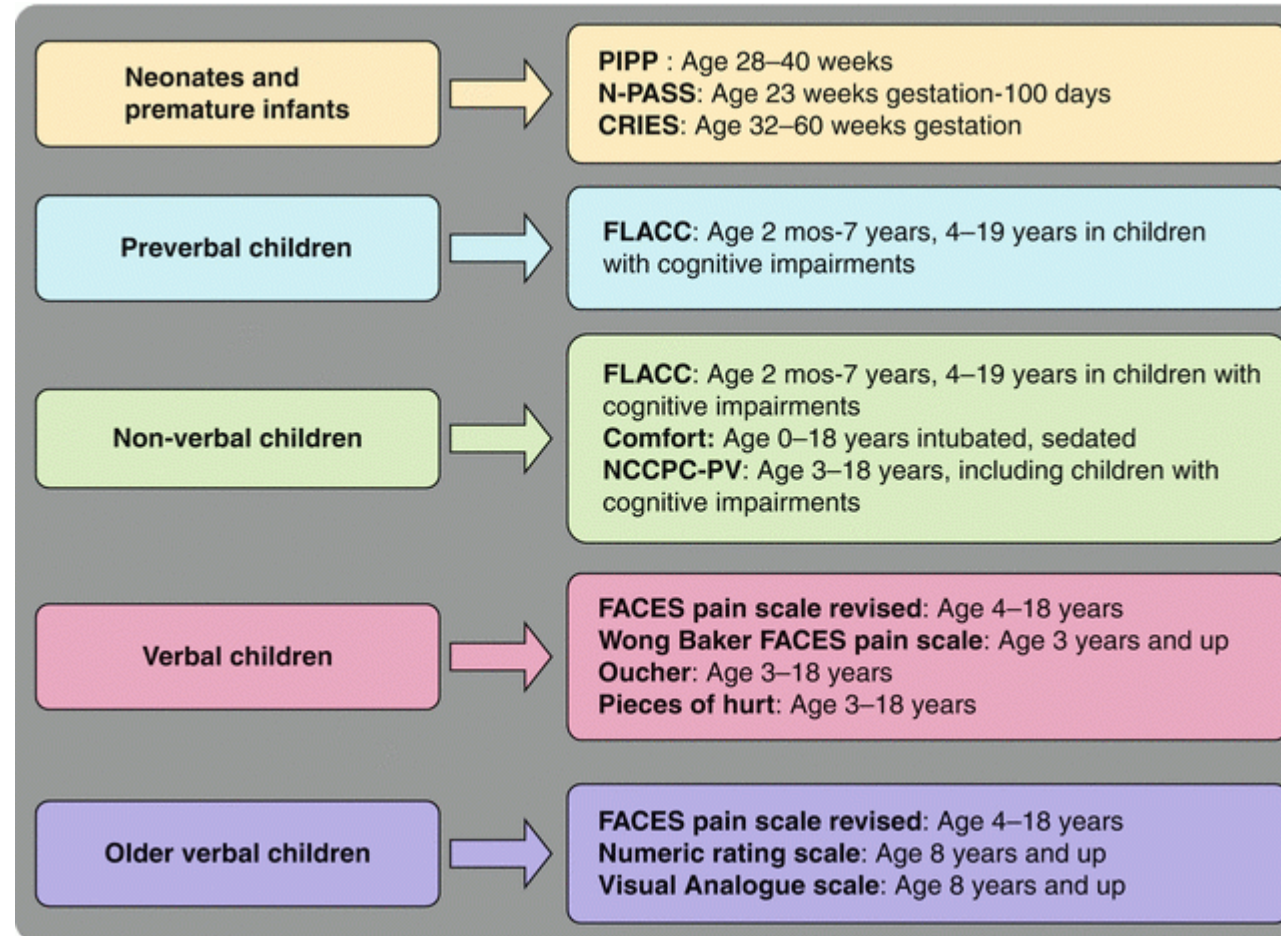
# COMFORT/ COMFORT B

<b>ALERTNESS</b>	1 - Deeply asleep 2 - Lightly asleep 3 - Drowsy 4 - Fully awake and alert 5 - Hyper alert								
<b>CALMNESS</b>	1 - Calm 2 - Slightly anxious 3 - Anxious 4 - Very anxious 5 - Panicky								
<b>RESPIRATORY DISTRESS</b>	1 - No coughing and no spontaneous respiration 2 - Spontaneous respiration with little or no response to ventilation 3 - Occasional cough or resistance to ventilation 4 - Actively breathes against ventilator or coughs regularly 5 - Fights ventilator, coughing or choking								
<b>CRYING</b>	1 - Quiet breathing, no crying 2 - Sobbing or gasping 3 - Moaning 4 - Crying 5 - Screaming								
<b>PHYSICAL MOVEMENT</b>	1 - No movement 2 - Occasional, slight movement 3 - Frequent, slight movements 4 - Vigorous movement 5 - Vigorous movements including torso and head								
<b>MUSCLE TONE</b>	1 - Muscles totally relaxed; no muscle tone 2 - Reduced muscle tone 3 - Normal muscle tone 4 - Increased muscle tone and flexion of fingers and toes 5 - Extreme muscle rigidity and flexion of fingers and toes								
<b>FACIAL TENSION</b>	1 - Facial muscles totally relaxed 2 - Facial muscle tone normal; no facial muscle tension evident 3 - Tension evident in some facial muscles 4 - Tension evident throughout facial muscles 5 - Facial muscles contorted and grimacing								
<b>BLOOD PRESSURE (MAP) BASELINE</b>	1 - Blood pressure below baseline 2 - Blood pressure consistently at baseline 3 - Infrequent elevations of 15% or more above baseline (1-3 during 2 minutes observation) 4 - Frequent elevations of 15% or more above baseline (> 3 during 2 minutes observation) 5 - Sustained elevations of 15% or more								
<b>HEART RATE BASELINE</b>	1 - Heart rate below baseline 2 - Heart rate consistently at baseline 3 - Infrequent elevations of 15% or more above baseline (1-3 during 2 minutes observation) 4 - Frequent elevations of 15% or more above baseline (> 3 during 2 minutes observation) 5 - Sustained elevations of 15% or more								

- Validated for use in ventilated children in ICU, non-communicant children
- Multidimensional tool
- 9 questions, rated from 1 to 5

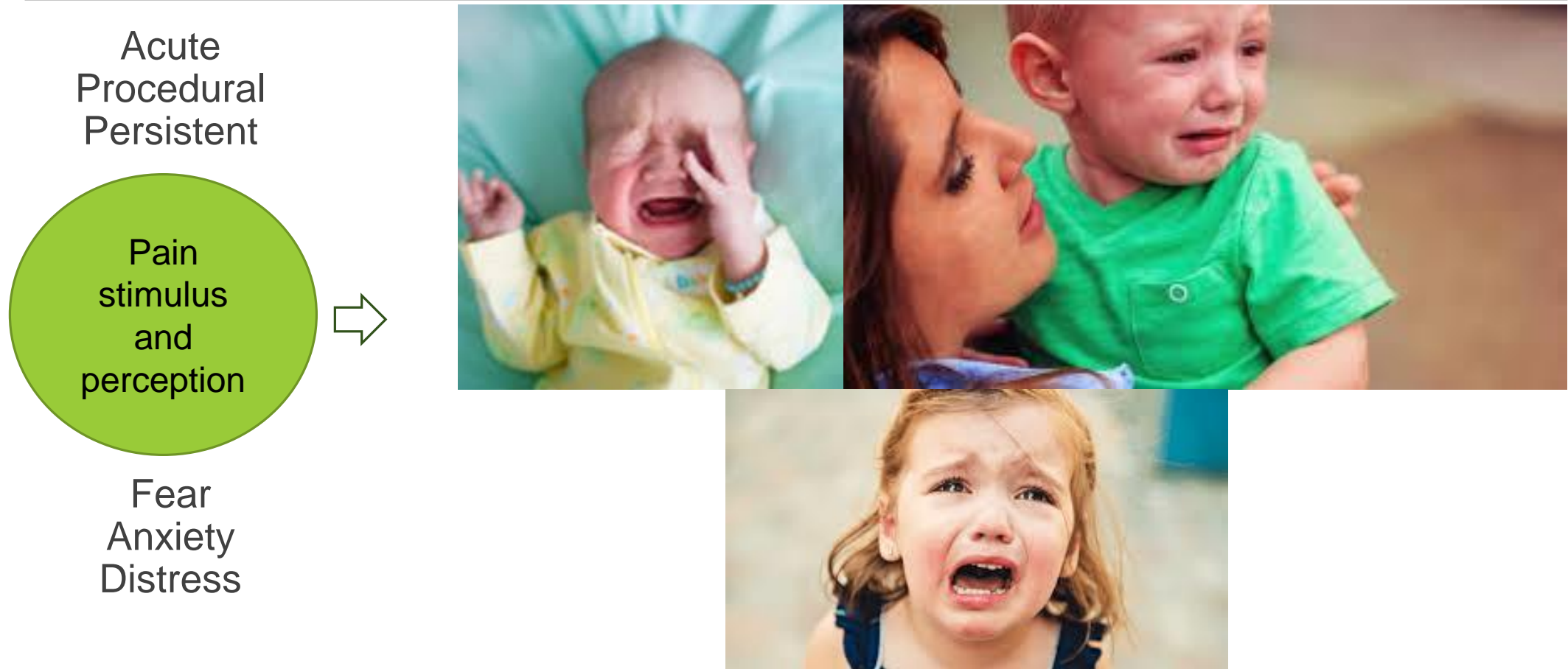
Ambuel B., Hamlett K., Marx C., Blumer J. – Assessing distress in pediatric intensive care environments: the COMFORT Scale. *Journal of Pediatric Psychology*, 17(1): 95-109.

# Pediatric pain assessment

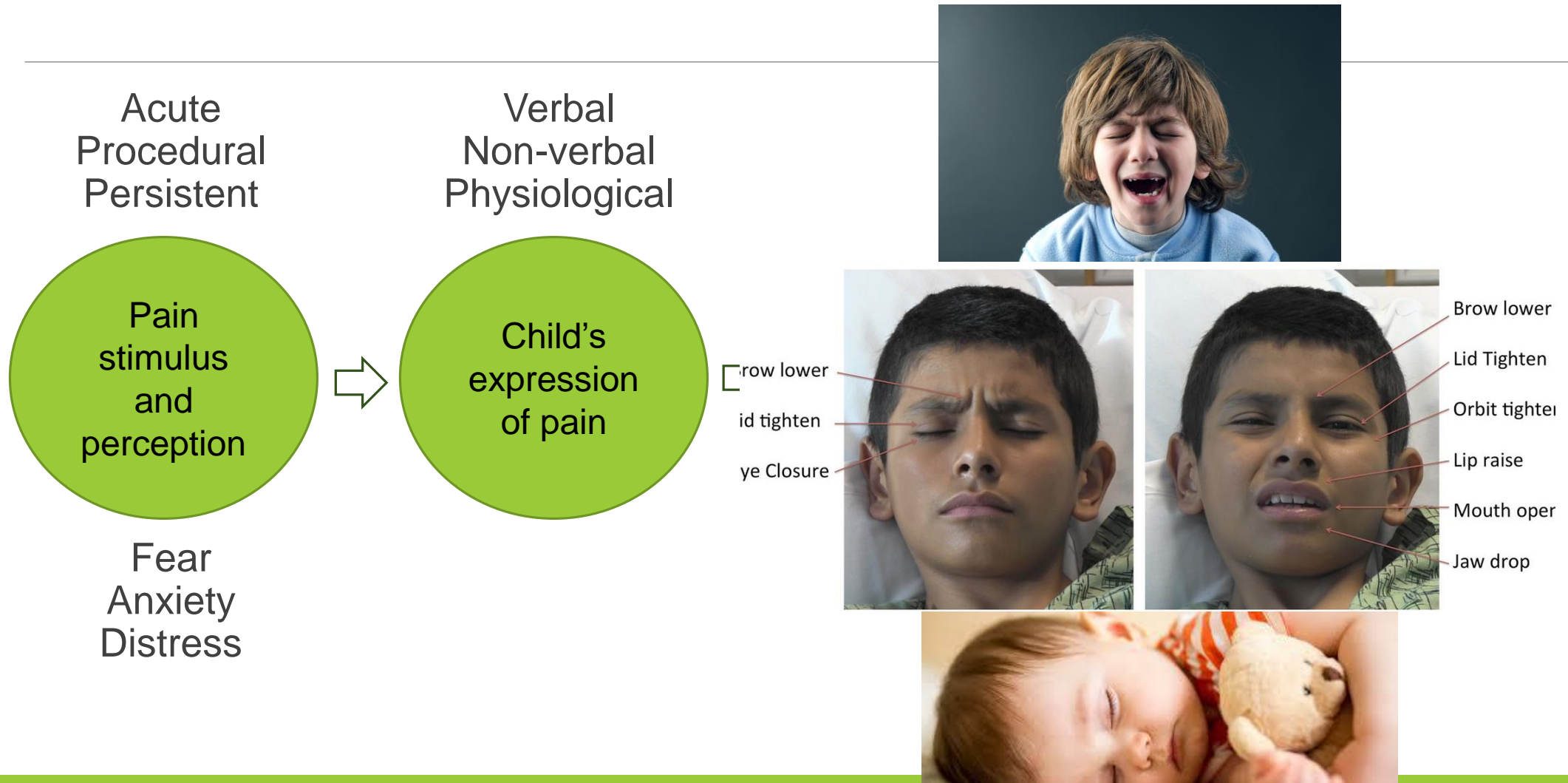




# The social communication model of pain



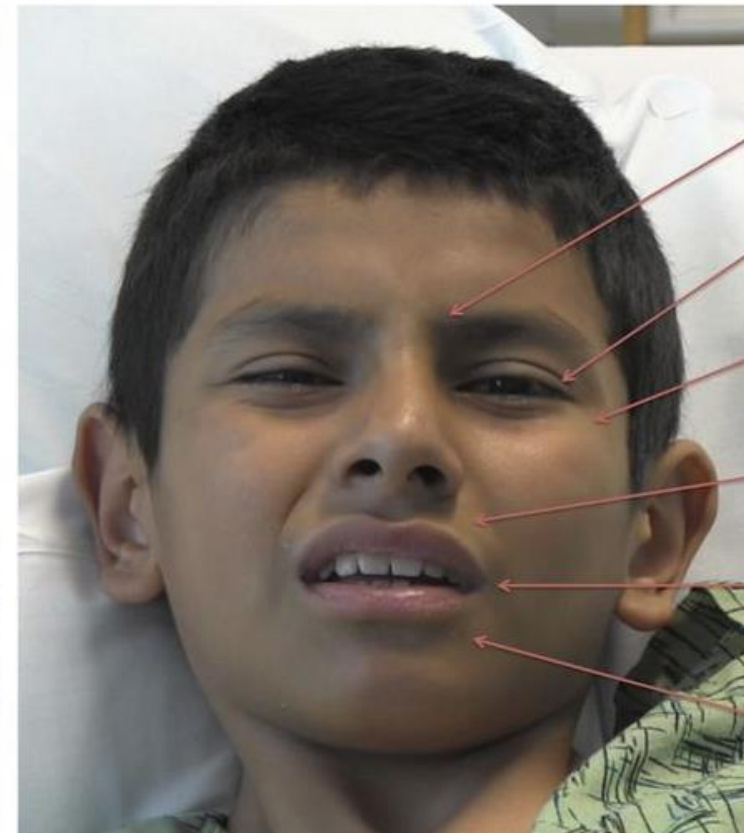
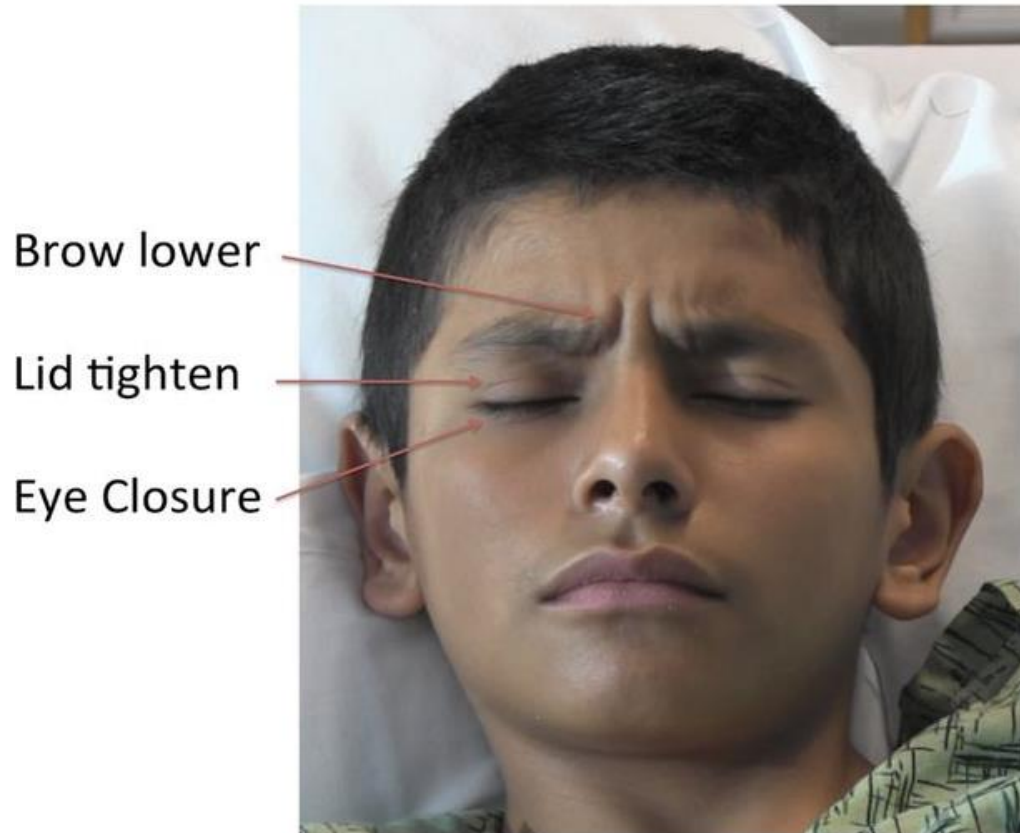
# The social communication model of pain



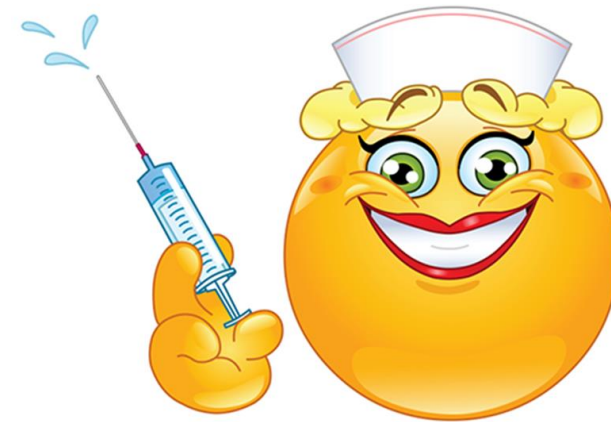
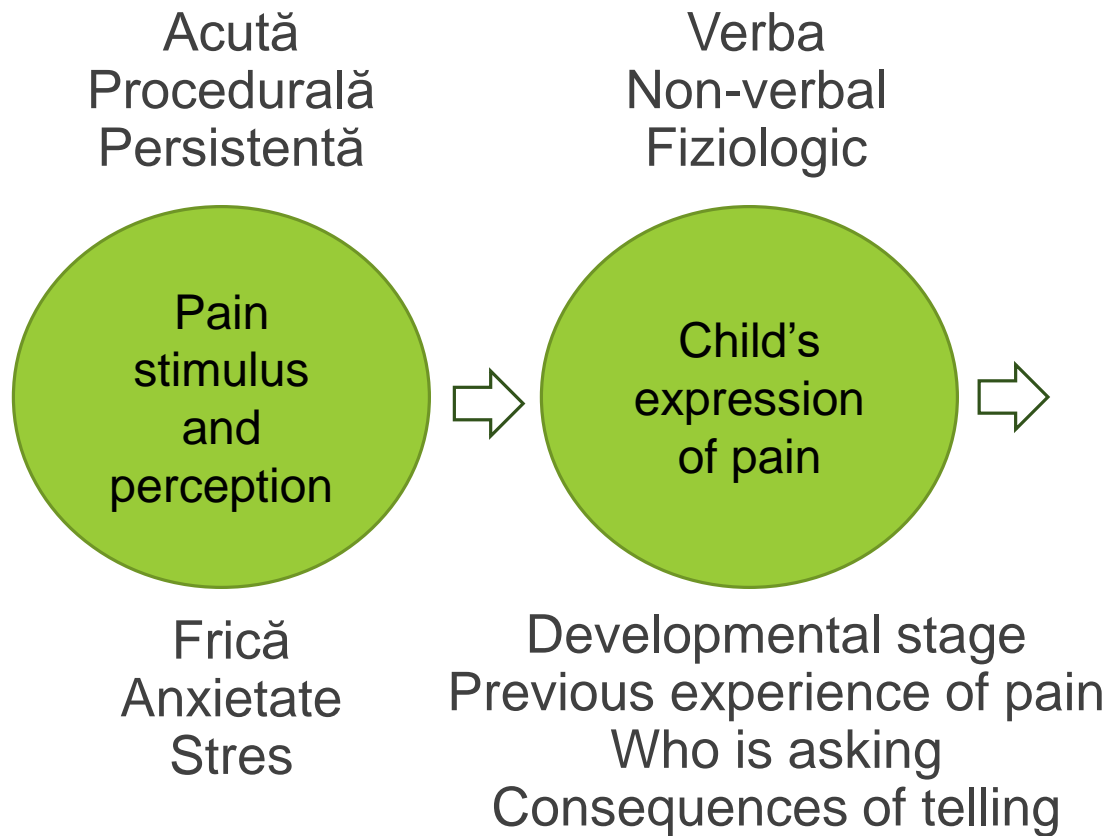


# Pain evaluation: observation

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# The social communication model of pain



# Previous experience of pain

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State

Language

Strategies that helped

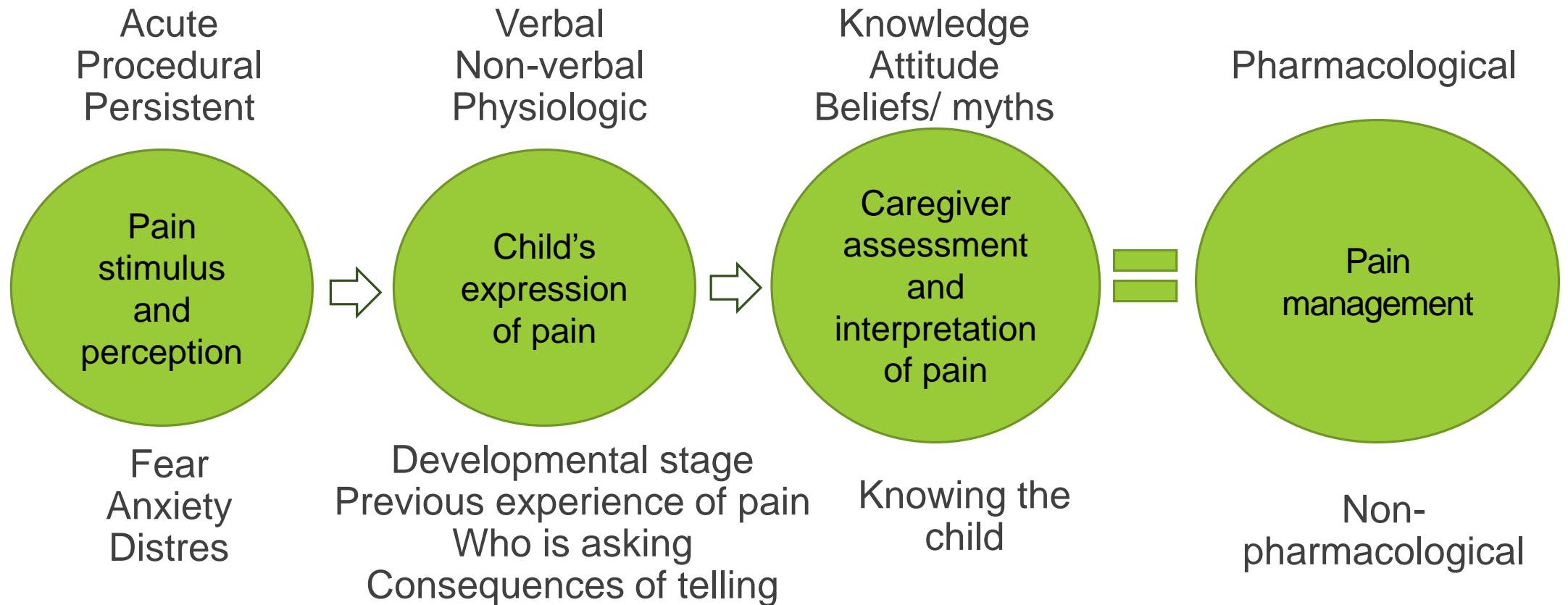
Previous procedures

What has functioned

Knows what will happen



# The social communication model of pain



# Pain relief: PPP approach

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pre-emptive

pro-active

preventive

# Pain relief in children: routes of administration

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- intravenous
- subcutaneous in-dwelling cannulae
- rectal
- oral
- topical local anaesthetic creams (EMLA, Ametop) should be used prior to painful needle procedures

the intramuscular route should be avoided !!!

# Pain relief in children: multimodal approach

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Preoperative: NSAIDs & paracetamol

Intraoperative: loading with opioids, local anaesthetic–infiltration or regional– techniques

Postoperative: regularly prescribed analgesia, adequate rescue analgesia for breakthrough pain, extra analgesia in anticipation of painful procedures (physiotherapy, dressing changes, drain removal)



# Patient-Controlled Analgesia



- PCA has become synonymous with giving IV opioids
- But... in its broadest sense it refers to a method of pain relief, where the patient can decide how much drug they receive
- It avoids the peaks and troughs in blood concentration associated with intramuscular injections

# Patient selection for using PCA: indications

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- willingness of the patient to administer their own analgesia
- patient is able to understand the concept of PCA
- physically able to press the button



# Patient selection for using PCA: contraindications

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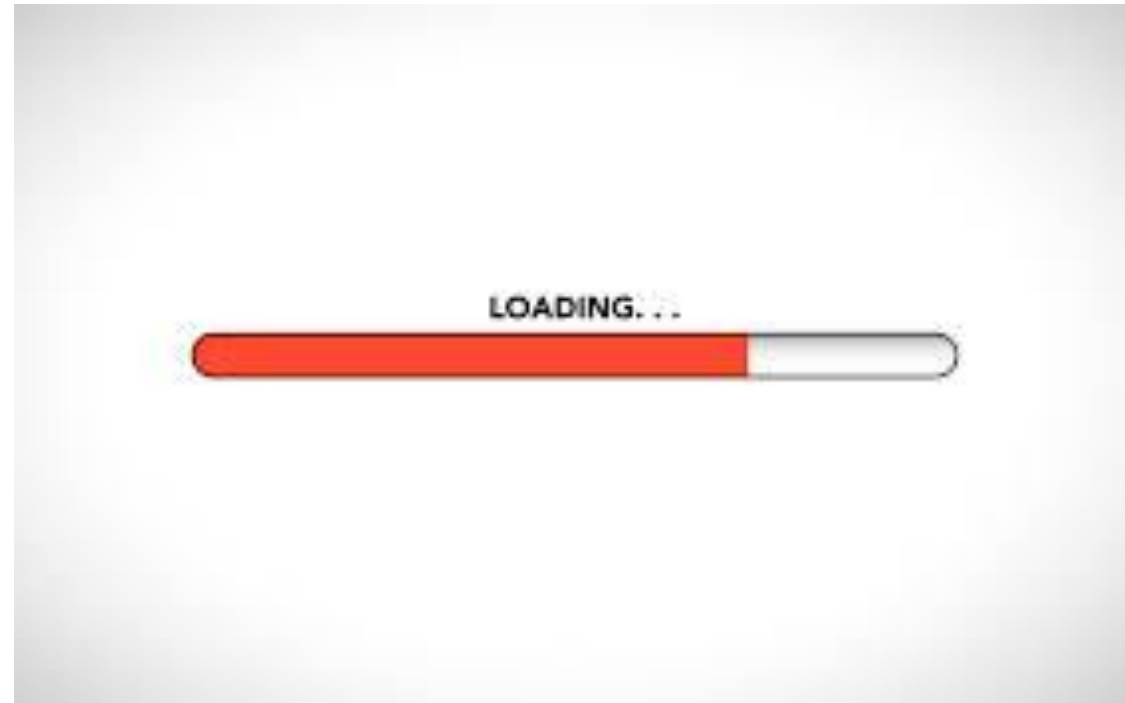


- refusal of the patient to administer their own analgesia
- confused or has language difficulties
- patients who have had a stroke, arthritis or trauma to the hands

# PCA programmes and definitions: loading dose

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Loading dose – the amount given to the patient to ensure that their pain is controlled, prior to starting PCA



# PCA loading dose: an example

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- E. g.: ICU: load the patient with up to 10 mg of morphine if the patient was opioid naive
- Most standard PCA prescriptions start with a 1-mg bolus dose and 5-min lockout.
- In the absence of loading dose – this may require the patient to press up to ten times to achieve a comfortable state and would take a minimum of 50 min. Most patients will stop trying after three or more presses and assume that the system does not work.

1. Blount, R. L. and K. A. Loiselle (2009). "Behavioural assessment of pediatric pain." *Pain Res Manag* 14(1):

2. Cohen, L. L., K. Lemanek, R. L. Blount, L. M. Dahlquist, C. S. Lim, T. M. Palermo, K. D. McKenna and K. E. Weiss (2008). "Evidence-based assessment of pediatric pain." *J Pediatr Psychol* 33(9): ; discussion.

# PCA programmes and definitions: bolus dose

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- bolus dose – the amount of drug that the patient receives when they press the button
- for most patients this is usually 1 mg of morphine



# PCA programmes and definitions: bolus dose

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too low bolus dose



inadequate  
analgesia



too high bolus dose



side effects



# PCA programmes and definitions: dose duration

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- Dose duration – the amount of time that it takes to deliver the bolus dose
- most PCA machines allow for the bolus duration to be modified
- usually, most doses are given over approximately 30–45 s.



# PCA programmes and definitions: lockout interval

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- Lockout interval – the minimal time interval before another bolus dose can be requested
- allow time for the drug to start to work, though peak concentration of most opioids following i.v. administration can take up to 15 min
- the lockout interval for i.v. PCA morphine is usually 5 min, for subcutaneous morphine 10 min and for IV fentanyl 3 min
- the lockout interval does limit the total amount of drug that the patient can request, but it should not be viewed as a method of preventing overdose (!)

1. Blount, R. L. and K. A. Loiselle (2009). "Behavioural assessment of pediatric pain." *Pain Res Manag* 14(1):

2. Cohen, L. L., K. Lemanek, R. L. Blount, L. M. Dahlquist, C. S. Lim, T. M. Palermo, K. D. McKenna and K. E. Weiss (2008). "Evidence-based assessment of pediatric pain." *J Pediatr Psychol* 33(9): ; discussion.

# Lockout interval: an example

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- i.v. morphine PCA with a standard dose of 1 mg and a 5-min lockout
- this would allow the patient to receive a possible 12 mg/hr
- for many patients this would be a sedating and possibly a respiratory depressing dose
- the main method of preventing overdose with PCA is that the patient will fall asleep when they have had too high dose for their individual requirements
- the patient cannot press the button and request a further dose when they are asleep and so prevent themselves from overdosing.

1. Blount, R. L. and K. A. Loiselle (2009). "Behavioural assessment of pediatric pain." *Pain Res Manag* 14(1):

2. Cohen, L. L., K. Lemanek, R. L. Blount, L. M. Dahlquist, C. S. Lim, T. M. Palermo, K. D. McKenna and K. E. Weiss (2008). "Evidence-based assessment of pediatric pain." *J Pediatr Psychol* 33(9): ; discussion.

# PCA programmes and definitions: background infusion

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- PCA devices will allow for a concurrent background infusion in addition to allowing the patient to request a bolus dose
- not used for routine patients, because of a greater incidence of respiratory depression (!)
- useful in patients who are receiving long-term opioids prior to surgery (malignant disease, chronic painful conditions such as arthritis, sickle-cell disease, i.v. drug misusers)

# PCA background infusion: patients taking opioids for chronic painful conditions

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- patient A., 56 years old, with chronic arthritic pain, on admission takes:
- MST Continus 40 mg twice/24 h (Morphine sulphate modified release)
- Morphine sulphate immediate release oral solution 20 mg one dose daily

# PCA background infusion: an example

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- Total daily dose of oral morphine  $(40+40+20) = 100$  mg
- Total daily dose of intravenous morphine  $(100/2) = 50$  mg
- Half of the daily intravenous dose = 25 mg
- Run as a background infusion over 24 hr ~ 1 mg/hr
- The bolus dose should be started at 2-mg morphine, with a 5-min lockout, to allow for tolerance\*

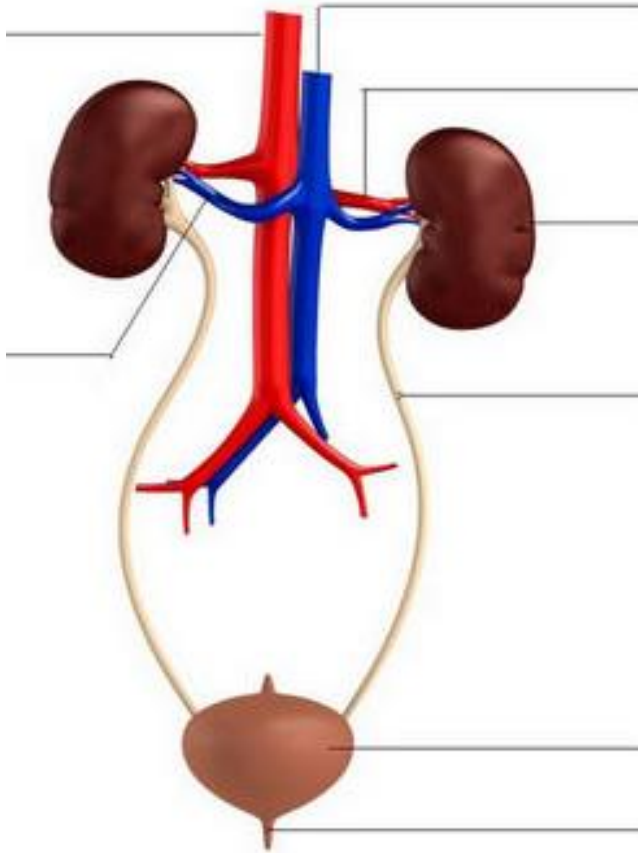
# Pain management in elderly

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- altered physiological and pharmacokinetic responses to pain and to analgesics
- reluctant to report pain
- have cognitive impairment that reduces their ability to report their pain
- pain is frequently undertreated

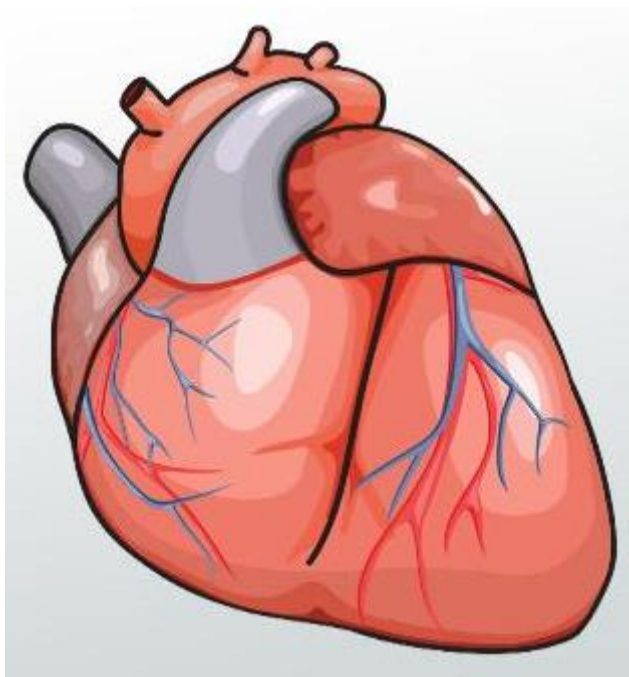
# Physiological changes of aging



- GFR declines by 1.0–1.5% per year from the age of 25
- reduced muscle bulk (creatinine an unreliable marker of renal function)
- many labs now provide an estimated GFR (reasonably reliable indicator)
- reduction in renal clearance of drugs



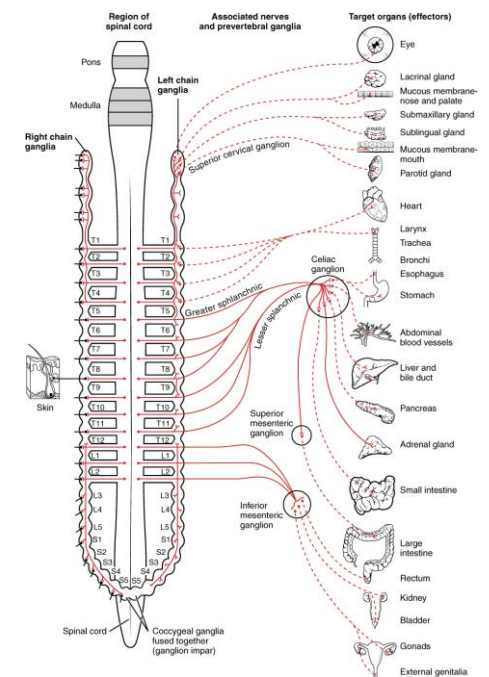
# Physiological changes of aging



CO declines by 1% per year from the age of 30



reduction in prostaglandins in the gastric mucosa (Helicobacter pylori infection is common)



reduction of sympathetic tone and of autonomic function generally

# Pharmacokinetic changes in the elderly: absorption

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oral route



buccal route



transdermal  
route



trans-  
bronchial



intramuscular

# Pharmacokinetic changes in the elderly: absorption

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oral route

effective as transit time in the gut is slowed, but blood flow is also reduced



buccal route

may be a problem if production of saliva falls

# Pharmacokinetic changes in the elderly: absorption

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work well, despite the reduction in subcutaneous fat in some elderly people

transdermal  
route



work well

transbronchial routes

# Pharmacokinetic changes in the elderly: absorption

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intramuscular

intramuscular routes should be avoided in any age group (!)

are particularly unreliable in the elderly due to reduction in muscle bulk and muscle-to-fat ratios

# Pharmacodynamic changes in the elderly

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- the populations of  $\mu$  (mu)-opioid receptors are reduced in older people
- a slower response to painful stimuli
- autonomic function is reduced
- more side effects



# Cognitive impairment in the elderly

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- patients with dementia express their pain by: increased agitation, screaming, verbal and physical abuse
- often treated with antipsychotic drugs, which mask the effects of the pain
- Assessment of Discomfort in Dementia Protocol
- the views of relatives/ carers are also important in assessing pain in these patients



# Specific analgesic medicines in elderly: opioids

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nausea and vomiting (25%)  
(anti-emetics regularly,  
rotated if they become  
ineffective)



constipation  
(laxatives should also be  
regularly prescribed,  
prevention with the proper  
intake of fluids and fiber)



itching  
(the use of  
antihistamines in  
response can be  
sedating)

# Specific analgesic medicines in elderly: paracetamol

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- paracetamol is commonly used in the older person
- hepatic function is well preserved in older people and they are at risk only if they have specific liver disease
- is of particular value in this group, because it has very few interactions with other drugs, and many patients are taking multiple medicines for cardiac and other morbidities

# Specific analgesic medicines in elderly: tramadol

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- rapidly absorbed and peak serum concentrations are attained about 2 hr after oral ingestion
- elimination half-life of 6.3 hr and is poorly bound to plasma proteins (20%)
- indicated for the management of moderate to moderately severe pain and the usual dose is 50–100 mg every 4–6 h, as needed

# Specific analgesic medicines in elderly: tramadol

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- patients >75 years of age used 20% less tramadol than patients <65 years but experienced similar analgesia
- maximum dosage  $\leq$  400 mg daily or 100 mg/dose
- $\geq$  75 years should not receive more than 300 mg daily
- if creatinine clearance  $\leq$  30 mL/min, the dosing interval should be increased to every 12 hr and the total dose  $\leq$  200 mg daily
- if cirrhosis of the liver - no more than 50 mg every 12 h

# Specific analgesic medicines in elderly: local anaesthetic blocks

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epidural and spinal analgesia

special concerns: ↓ sympathetic  
tone → an exaggerated  
hypotensive response to extradural  
or intrathecal local anaesthetics

# Specific analgesic medicines in elderly: NSAIDs

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- reduction in prostaglandin production in the gastric mucosa in the elderly  
    ➡ haemorrhage with no preceding pain or dyspepsia
- proton pump inhibitors may be protective, but they can also mask symptoms relating to mucosal damage
- renal effects fall into two categories:
  - ✓ renal blood flow is maintained by prostaglandins and falls when NSAIDs are given
  - ✓ renal sodium reabsorption increases in the presence of NSAIDs and this can lead to water retention and precipitation of heart failure

# Specific analgesic medicines in elderly: NSAIDs

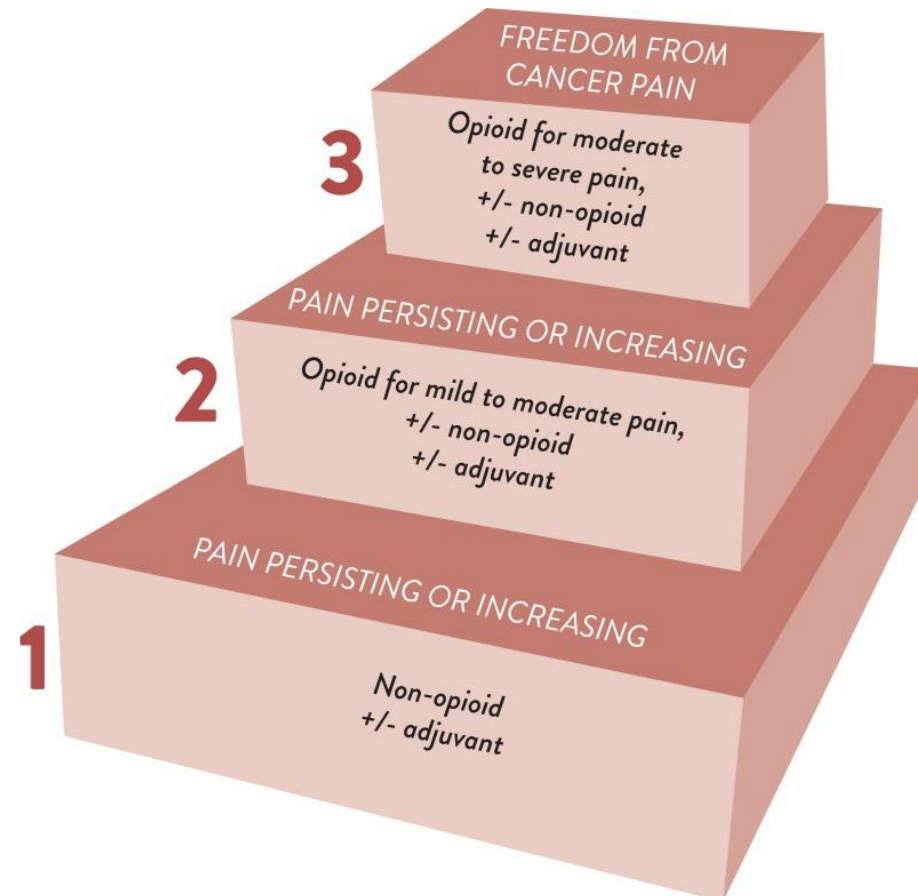
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- platelet dysfunction occurs with NSAIDs and may be significant if the patient is already receiving aspirin or anticoagulants
- central nervous system disturbance: sedation, confusion, cognitive dysfunction, psychosis and personality changes
- use the lowest dose for the shortest possible time, monitoring closely for adverse effects
- dose reduction is required in patients with liver disease as most NSAIDs are metabolised by the liver



# Pain management: the WHO analgesic ladder

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# Neuropathic pain

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“Pain caused by a lesion or disease of the somatosensory nervous system.”

lesion = investigations/ identifiable injury/ evident traumatism

pathology = known (CVA, vasculitis, diabetis melitius, genetic disease)

# Traumatic injury to peripheral nerves also causes neuropathic pain

Original Papers

## The Early Detection and Management of Neuropathic Pain Following Combat Injury



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### Abstract

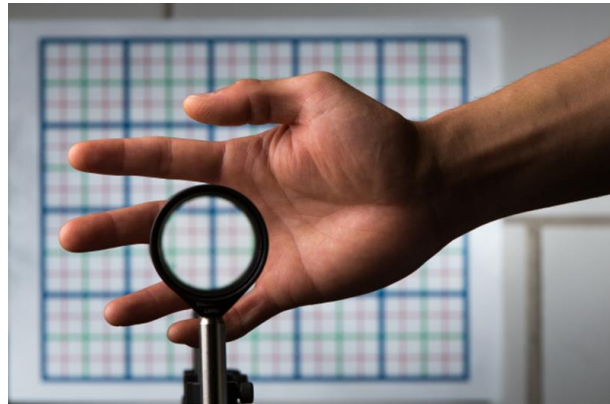
The mechanism of injury on the modern battlefield results in a pattern of wounding which is associated with both nociceptive and neuropathic pain. Nociceptive pain is managed using the WHO Analgesic Ladder but neuropathic pain requires the use of co-analgesic drugs, e.g. antidepressants and anticonvulsants. This study was designed to determine the incidence of neuropathic pain within military casualties with limb injuries. From May to November 2007, 50 casualties were interviewed and assessed using the Leeds Assessment of Neuropathic Symptoms and Signs Scale (LANSS) over consecutive weeks. During the first week post injury, 30% of casualties had a LANSS pain score  $>12$ .

# Clinical features of neuropathic pain

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## Negative

hypoesthesia zones –  
reduced perception of  
noxious or heat stimuli



## Positive

Spontaneous and evoked symptoms

- shooting
- electric shock
- tingling or "ants crawling"



# The Leeds Assessment of Neuropathic Symptom and Signs Pain Score (S-LANSS)

**THE LANSS PAIN SCALE**  
Leeds Assessment of Neuropathic Symptoms and Signs

NAME \_\_\_\_\_ DATE \_\_\_\_\_

This pain scale can help to determine whether the nerves that are carrying your pain signals are working normally or not. It is important to find this out in case different treatments are needed to control your pain.

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**A. PAIN QUESTIONNAIRE**

- Think about how your pain has felt over the last week.
- Please say whether any of the descriptions match your pain exactly.

1) Does your pain feel like strange, unpleasant sensations in your skin? Words like pricking, tingling, pins and needles might describe these sensations.

a) NO - My pain doesn't really feel like this..... (0)

b) YES - I get these sensations quite a lot..... (5)

2) Does your pain make the skin in the painful area look different from normal? Words like mottled or looking more red or pink might describe the appearance.

a) NO - My pain doesn't affect the colour of my skin..... (0)

b) YES - I've noticed that the pain does make my skin look different from normal .... (5)

3) Does your pain make the affected skin abnormally sensitive to touch? Getting unpleasant sensations when lightly stroking the skin, or getting pain when wearing tight clothes might describe the abnormal sensitivity.

a) NO - My pain doesn't make my skin abnormally sensitive in that area..... (0)

b) YES - My skin seems abnormally sensitive to touch in that area..... (3)

4) Does your pain come on suddenly and in bursts for no apparent reason when you're still. Words like electric shocks, jumping and bursting describe these sensations.

a) NO - My pain doesn't really feel like this ..... (0)

b) YES - I get these sensations quite a lot ..... (2)

5) Does your pain feel as if the skin temperature in the painful area has changed abnormally? Words like hot and burning describe these sensations

a) NO - I don't really get these sensations..... (0)

b) YES - I get these sensations quite a lot ..... (1)

- identify the unique aspects of neuropathic pain
- based on analysis of sensory description and bedside examination of sensory dysfunction
- a score of 12 or more indicates that pain is of a neuropathic origin

# Multidimensional pain-rating scales: The Short-Form McGill Pain Questionnaire (SF-MPQ)

Please answer the 36 questions of the Health Survey completely, honestly, and without interruptions.

**CIRCLE YOUR BEST ANSWER**

1) **GENERAL HEALTH:** In general, would you say your health is:  
Excellent    Very Good    Good    Fair    Poor

2) **Compared to one year ago, how would you rate your health in general now?**  
Much better    Somewhat better    About the same    Somewhat worse    Much worse

**Limitations of Activities:** The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

3) **Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.**  
Yes, Limited a lot    Yes, Limited a Little    No, Not Limited at all

4) **Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

5) **Lifting or carrying groceries**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

6) **Climbing several flights of stairs**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

7) **Climbing one flight of stairs**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

8) **Bending, kneeling, or stooping**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

9) **Walking more than a mile**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

10) **Walking several blocks**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

11) **Walking one block**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

12) **Bathing or dressing yourself**  
Yes, Limited a Lot    Yes, Limited a Little    No, Not Limited at all

**Physical Health Problems:** During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

13) **Cut down the amount of time you spent on work or other activities**  
Yes    No

14) **Accomplished less than you would like**  
Yes    No

15) **Were limited in the kind of work or other activities**  
Yes    No

16) **Had difficulty performing the work or other activities (for example, it took extra effort)**  
Yes    No

**Emotional Health Problems:**

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

17) **Cut down the amount of time you spent on work or other activities**  
Yes    No

18) **Accomplished less than you would like**  
Yes    No

19) **Didn't do work or other activities as carefully as usual**  
Yes    No

20) **SOCIAL ACTIVITIES:** Emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?  
Not at all    Slightly    Moderately    Severe    Very Severe

21) **PAIN:** How much bodily pain have you had during the past 4 weeks?  
None    Very Mild    Mild    Moderate    Severe    Very Severe

15 pain descriptors:  
11 sensory  
4 affective  
dimensions of pain

# Acute neuropathic pain following surgery: symptoms & signs

Important criteria	Less important criteria
Spontaneous	Paroxysmal
Shooting	Pulsing
Burning	Radiology
Dysaesthesia	Nerve conduction
Allodynia	
Hyperalgesia	
Difficult to manage pain	
Poor response to opioids	
Good response to antineuropathics	



# Pharmacotherapy of pain

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Nociceptive pain	Neuropathic pain
Paracetamol	Tricyclic antidepressants
Non-steroidal anti-inflammatory drugs (NSAIDs)	Serotonin and noradrenaline reuptake inhibitors (SNRI)
Minor opioids	Gabapentinoids
Major opioids	

# Take home messages

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- "access to pain relief" is human right that exists independently from age of the patient
- there are different pain assessment tools
- there are pharmacological and non-pharmacological strategies for pain treatment
- there exist international guides for perioperative pain management
- perioperative pain management is a multidisciplinary problem

# Q&A

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