MANAGEMENT OF ANALGESICS IN ELDERLY

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HALAMAN DALAM RKZ

Definitions

IASP

- Unpleasant sensory and emotional experience associated with actual or potential tissue damage
- Can only be reported by the person experiencing it

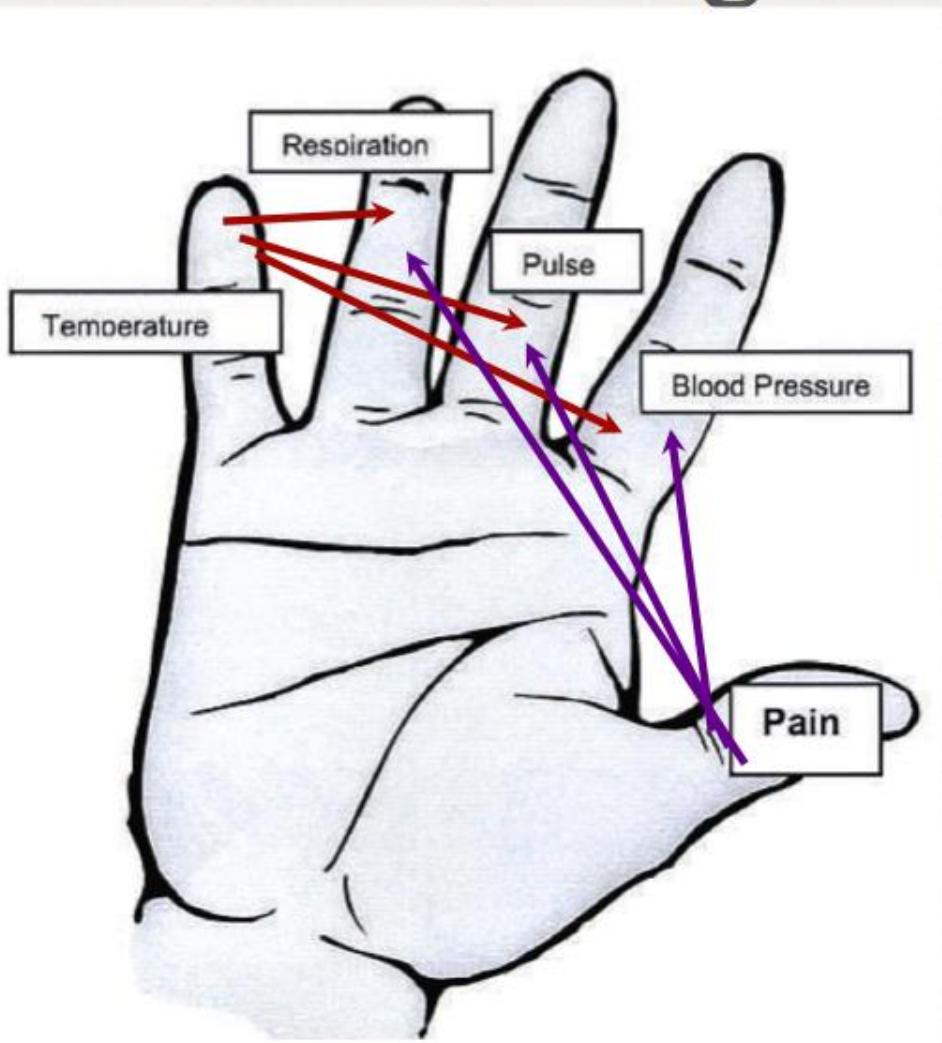
IASP
International Association for the Study of Pain

5th Vital Sign

Suhu 36°C
RR 12/mnt
HR 80/mnt
TD 110/80 mmHg

↓

Suhu 38,5°C
RR 26/mnt
HR 102/mnt
TD 130/90 mmHg



Nyeri 0/10
Suhu 36°C
RR 12/mnt
HR 80/mnt
TD 110/80 mmHg

↓

Nyeri 7/10
Suhu 36°C
RR 26/mnt
HR 102/mnt
TD 130/90 mmHg

GERIATRI

- Salah satu cabang ilmu kedokteran yang mempelajari keadaan fisiologis dan penyakit yang berhubungan dengan orang lanjut usia.
- Bahasa Yunani :
  - Geron = orang tua
  - Iatrea = penanganan terhadap penyakit

- Penurunan fungsi organ, seperti
  - Sistim respirasi
  - Sistim kardiovaskuler
  - Sistim saraf pusat
  - Sistim pencernaan
  - Sistim sensorik

KRITERIA

- **TOKYO METROPOLITAN GERIATRIC HOSPITAL**
  - 65 tahun – 74 tahun = early elderly
  - > 75 tahun = late eldelry

- **WHO**
  - Anak-anak : 0 – 17 tahun
  - Pemuda : 18 – 65 tahun
  - Setengah Baya : 66 – 79 tahun
  - Orang Tua : 80 – 99 tahun
  - Orang Tua berusia Panjang : > 100 tahun

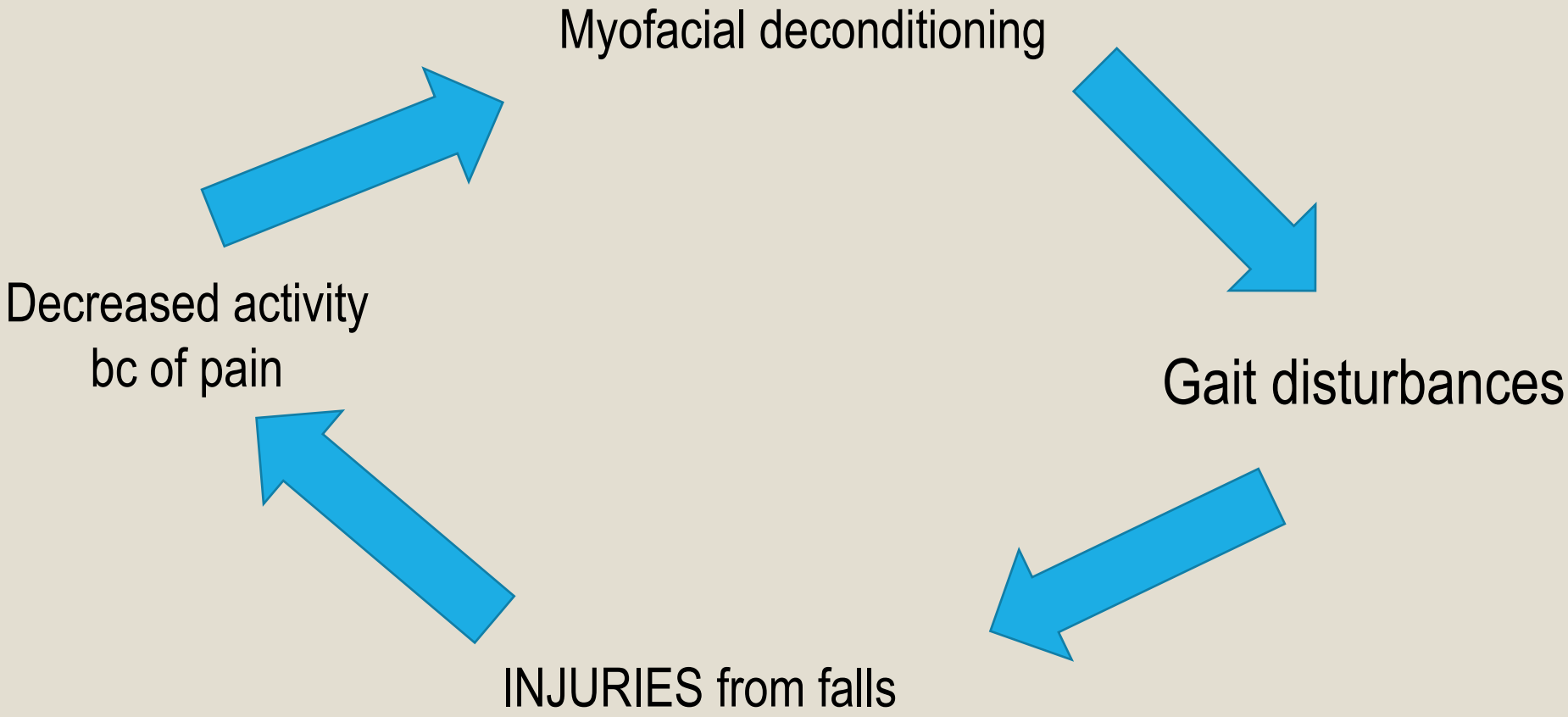
- In 2000 42% of population >65 and over reported long lasting disability

TABLE 1. Projected* U.S. population aged ≥65 years for 2005–2030 and number with arthritis or chronic joint symptoms (CJS), by year — Behavioral Risk Factor Surveillance System, United States

Year	No. (in thousands)	% U.S. population	No. with arthritis or CJS
2005	36,370	(12.6)	21,356
2010	39,715	(13.2)	23,291
2015	45,959	(14.7)	26,917
2020	53,733	(16.5)	31,439
2025	62,641	(18.5)	36,624
2030	70,319	(20.0)	41,102

* On the basis of sex-specific rates of arthritis or CJS in 50 states, the District of Columbia, and three U.S. territories (Puerto Rico, Guam, and the U.S. Virgin Islands).

Being old → It's a risk factor!



PATHOPHYSIOLOGY OF PAIN

RSK St Vincentius a Paulo, Sabtu 4 Mei 2019

Why is pain physiology important ?

- **Many factors affect how we feel pain.**
  - Psychological factors are very important.
- **Different treatments work on different parts of the pathway.**
  - More than one treatment is usually needed.

RSK St Vincentius a Paulo, Saturday 4 Mei 2019

Mechanism of pain based on Pathophysiology

- **Nociceptive pain**: Results from stimulation of pain receptors.
  - **Somatic:** damage to body tissue, well localized
  - **Visceral:** from viscera, poorly localized, may have nausea
- **Neuropathic pain**: Results from dysfunctions or lesions in either the central or peripheral nervous systems.
- **Mixed pain** syndromes: multiple or unknown mechanisms (e.g. headaches, vasculitic syndromes).
- **Psychogenic Pain**: somatoform disorders, conversion reactions.

Age related changes:

- **Reduction in number and function** of peripheral nociceptive neurons
- **Sensory threshold** for thermal and vibratory stimuli **increase** with age
- Pain receptors: **50% decrease in Pacini's corpuscles**,10%-30% **decrease in Meissner's/Merkle's disks**
- Diminished endogenous analgesic response (**endorphins**)

  in the older patients.

Geriatric medicine: An evidence based approach 4th edition 2003

Age related changes:

Peripheral nerves :

Myelinated nerves

- Decreased density
- Increase abnormal / degenerating fibers
- Slower conduction velocity

Unmyelinated nerves

- Decreased number of large fibers (1.2-1.6 mm
- **No change in small fibers (0.4 mm)**
- Substance P content decreased

Geriatric medicine: An evidence based approach 4th edition 2003

Age related changes:

Central nervous system

- Loss in dorsal horn neurons

  Altered endogenous inhibition, **hyperalgesia**

- Loss of neurons in cortex, midbrain, brainstem

  18% loss in thalamus

Altered cerebral evoked responses

Decreased catecholamines, acetylcholine, GABA, serotonin

Endogenous opioids: mixed changes

Neuropeptides: no change

Geriatric medicine: An evidence based approach 4th edition 2003

Prevalence of pain in Elderly

- 1 in 5 elderly have pain
- 18% above 65 yrs are taking pain medications regularly
- One-fifth of adults 65 years and older said they had experienced pain in the past month that persisted for more than 24 hours
- Almost three-fifths of adults 65 yrs and older with pain said it had lasted for one year or more
- Women report severely painful joints more often than men (10 % versus 7 %)

CDC's National Center for Health Statistics 2006,

Prevalence of Pain in Elderly

- Community-dwelling older adults: 25–56%
- Nursing home residents: 45–80%
- Greater than 50% patients dying of a variety of illnesses, including cancer, COPD, CAD
- 31% of women & 19% of men > 75 yrs report pain in 3 or more sites

AGS panel on persistent pain in older persons, JAGS 50:s205-s224, 2002.

Ferrell B A: Pain evaluation and management in the nursing homes, Ann Intern Med, 123(9):681-687,1992.

Minner D M et.al., Evidence based assessment and treatment of persistent pain in the community dwelling elderly receiving home health services: A pathway, Home health care management and practice 17:294-301,2005.

Factors affecting perception of pain

- Pain affects quality of life far beyond the local region of injury
- Feeling of loneliness is predictor of psychological distress
- Lack of intimate relationships, dependency, and loss increase loneliness
- Loneliness has been shown to lower pain threshold
- Loneliness is a risk factor for depression

Deane G et.al., Overview of pain management in older persons. Clin Geriatr Med 24,185-201,2008.

Factors affecting the perception of pain

- Depression: lack of energy, avoidance of diversional activities, decreased engagement in treatment
- Anxiety: may inhibit participation in rehab efforts
- Sleep disturbance: pain is best predictor of sleep disturbance.
- Increased health care needs
- Isolation and reduced independence: Involvement with family and friends can provide pleasurable experience

Factors affecting perception of pain

- Focusing one's attention on pain makes the pain worse
- **Patients who have low levels of pain remember it as being worse than they originally reported**
- Pain can be a learned response, rather than a purely physical problem
- Psychosocial issues like patient's belief about their pain , their coping skills, their involvement in the "sick role", all have an impact on how much pain patients feel, and how it affects them

Challenges of pain assessment in older patients

- Myths that having pain is “natural” with aging
- Fears about addiction to pain medications
- Sensory and cognitive impairments
- Under-reporting
- **Co-morbidities complicating the clinical picture and caregivers' beliefs and the reliability of patients' pain.**
- Lack of congruence between patients' and caregivers' perceptions of pain
- **Caregiver may misinterpret pain perception**

Stein, W.M. Pain in the nursing home. Clinics in Geriatric Medicine 17, 575-94,2001
Stewart, K. et. al. Assessment approaches for older people receiving social care: content and coverage. International Journal of Geriatric Psychiatry 14, 147-56,1999.
Horgas, A.L. et. al. Pain in nursing home residents. Comparison of residents' self-report and nursing assistants' perceptions. Journal of Gerontological Nursing 27, 44-53, 2001.
Weiner, D., et. al. Chronic pain associated behaviours in the nursing home: resident versus caregiver perceptions. Pain 80, 577-88,1999.

Common pain syndromes in elderly

MUSCULOSKELETAL CONDITIONS

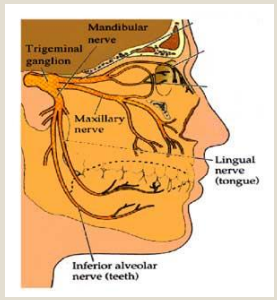
- OA
- Degenerative disk
- Osteoporosis
- Gout

RHEUMATOLOGIC CONDITIONS:

- RA
- Polymyalgia rheumatics
- Fibromyalgia

NEUROPATHIC CONDITIONS:

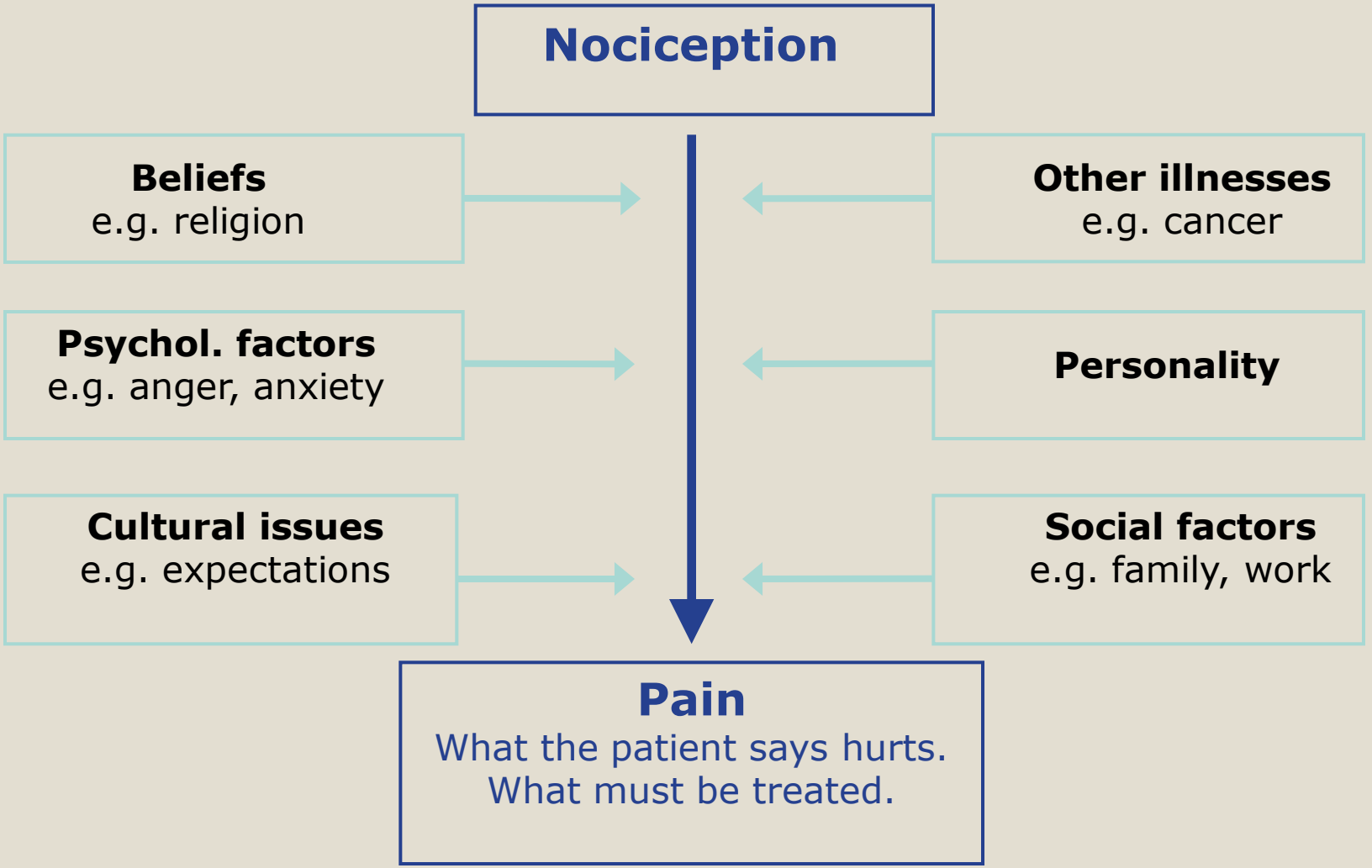
- Diabetic Neuropathy
- Post Herpetic Neuralgia
- Trigeminal Neuralgia
- Central post stroke pain
- Radicular pain secondary to degenerative disc

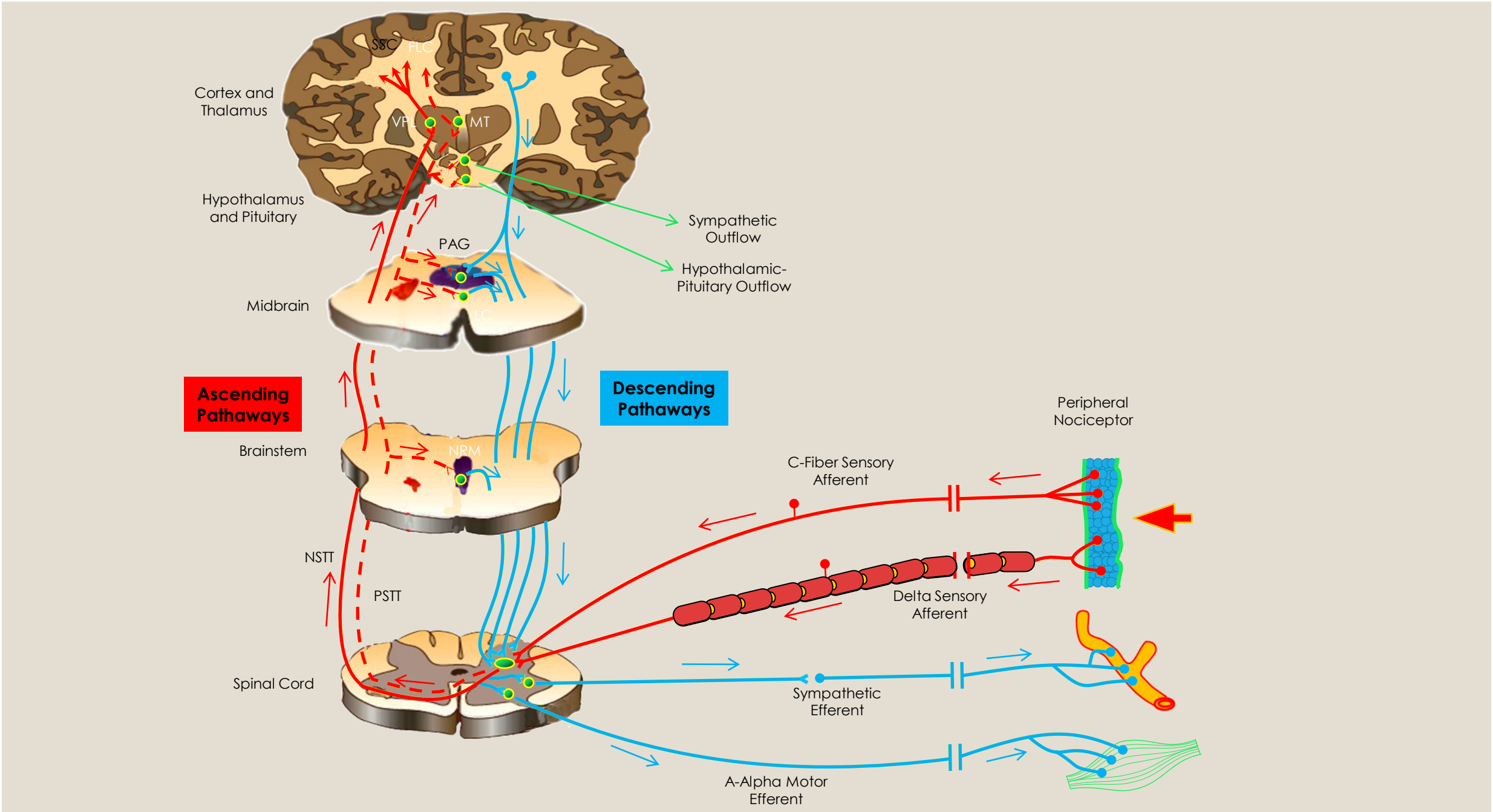


Nociception and Pain

- **Nociception**
  - How pain signals get from the site of injury to the brain.
- **Pain**
  - How we perceive or feel pain.
- **Nociception is not the same as pain. !**

Nociception is not the same as pain!

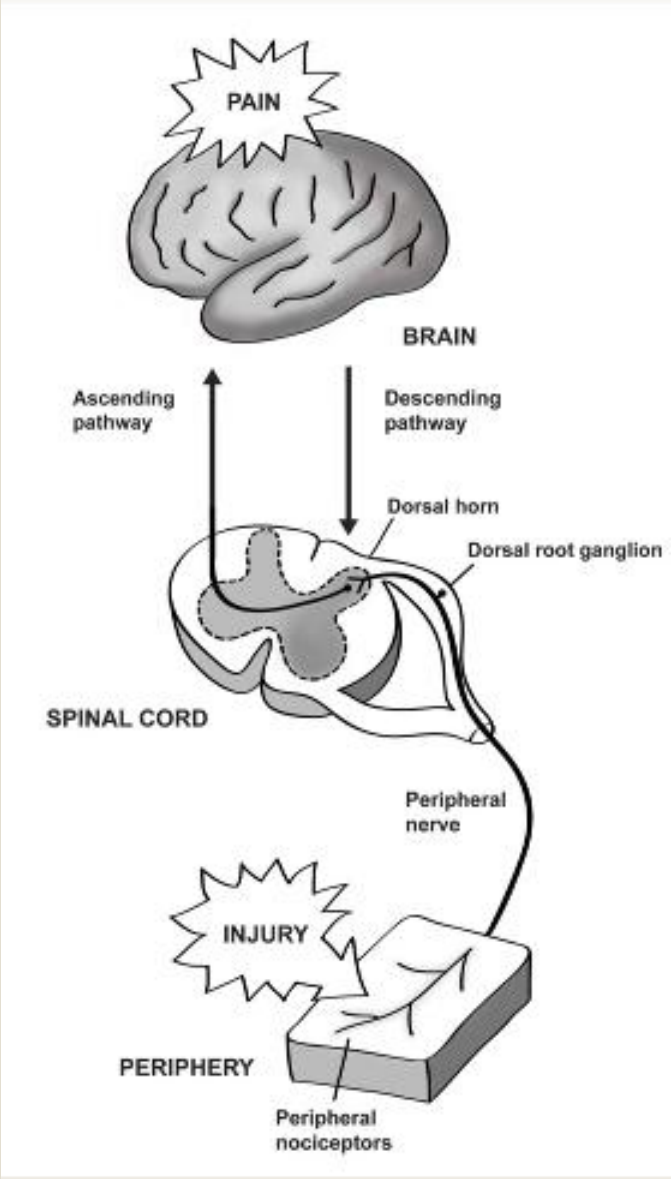



SSC
FLC
Cortex and Thalamus
VPL
MT
Hypothalamus and Pituitary
Sympathetic Outflow
Hypothalamic-Pituitary Outflow
PAG
Midbrain
LC
Ascending Pathaways
Descending Pathaways
Brainstem
NRM
Peripheral Nociceptor
C-Fiber Sensory Afferent
NSTT
PSTT
Delta Sensory Afferent
Spinal Cord
Sympathetic Efferent
A-Alpha Motor Efferent

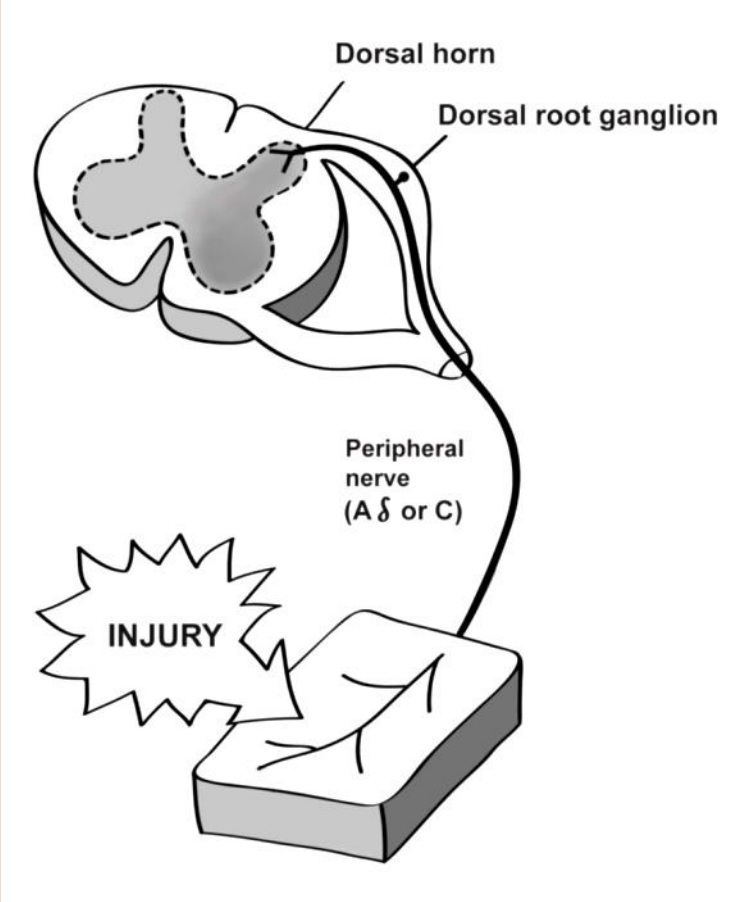
Physiology

- 4 steps:
  - Periphery
  - Spinal cord
  - Brain
  - Modulation

- We will look at each step.

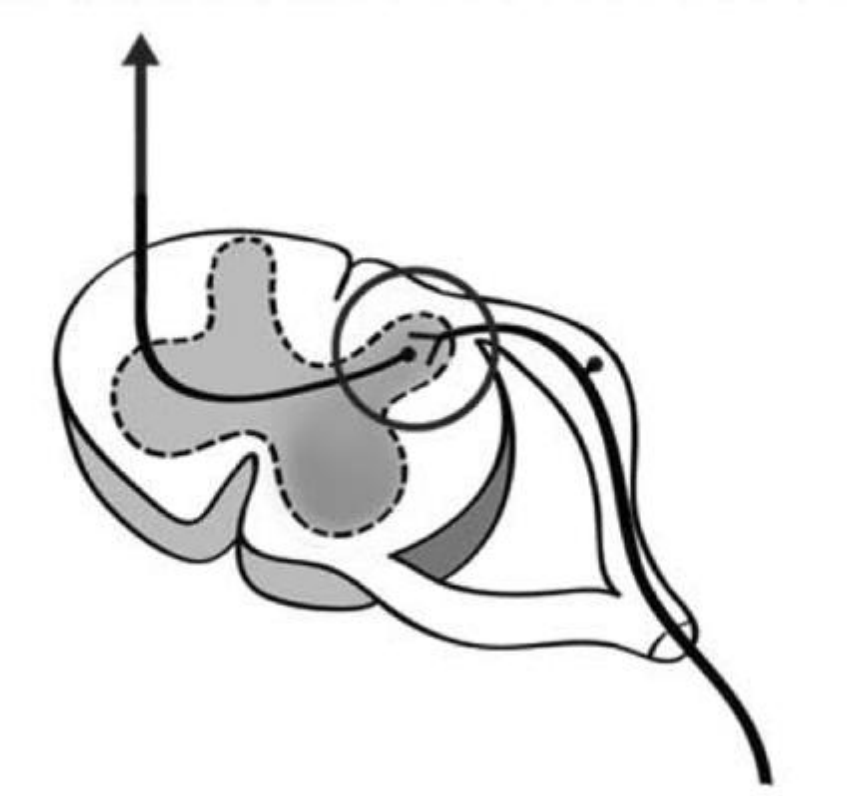


Periphery



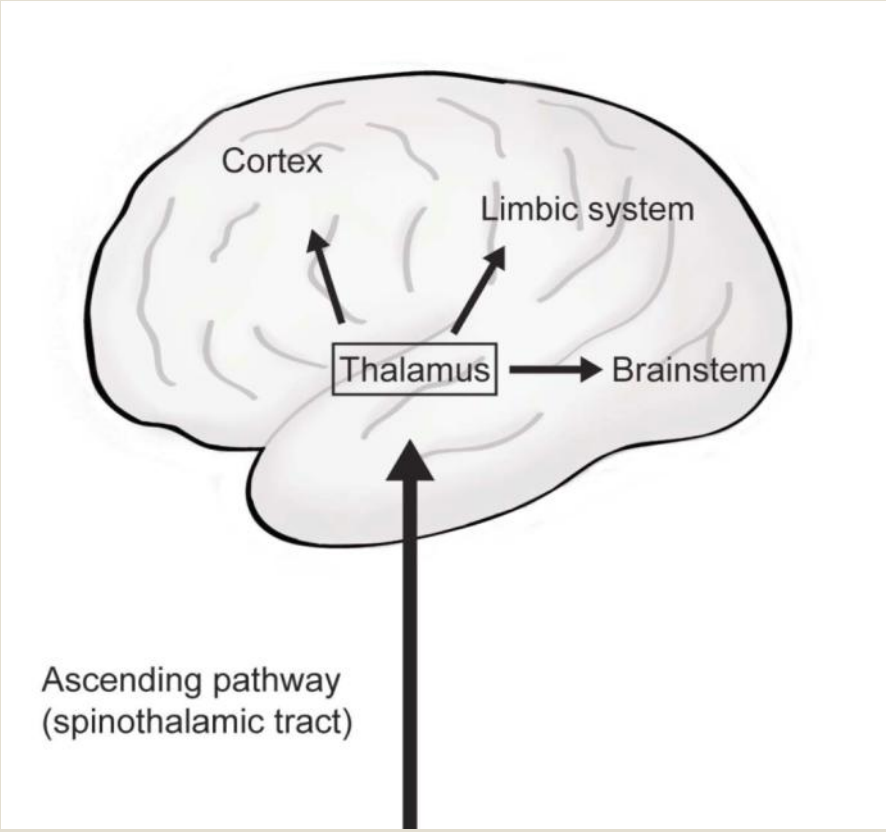
- Tissue injury
- Release of chemicals
- Stimulation of pain receptors (nociceptors)
- Signal travels in Aδ or C nerve to spinal cord.

Spinal Cord



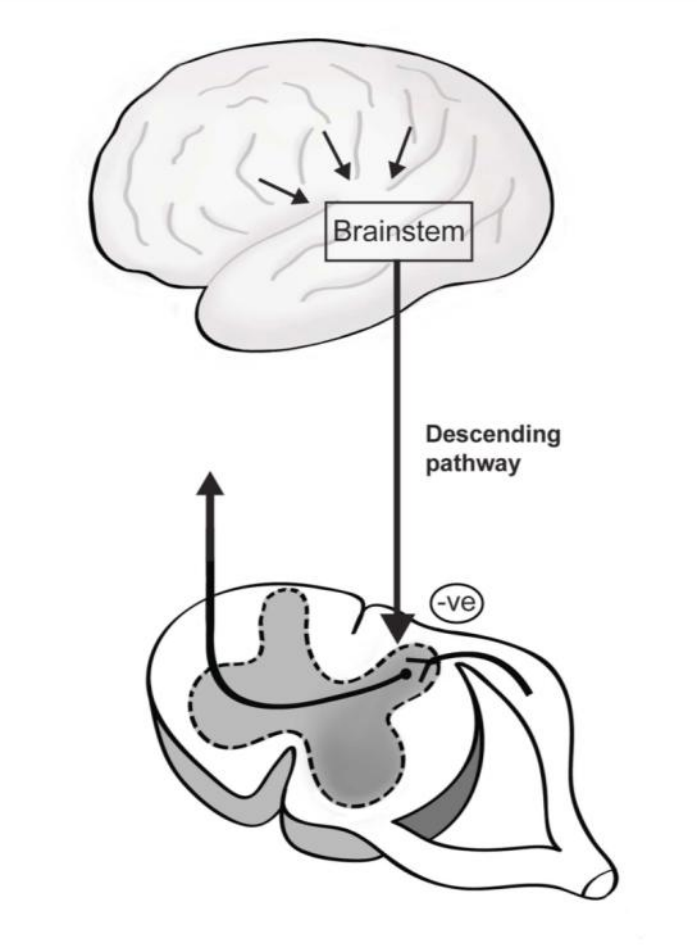
- Dorsal horn is the first relay station.
- Aδ or C nerve synapses (connects) with second order nerve.
- Second order nerve travels up opposite side of spinal cord.

Brain



- Thalamus is the second relay station.
- Connections to many parts of the brain.
  - Cortex
  - Limbic system
  - Brainstem
- Pain perception occurs in the brain.

Modulation



- Descending pathway from brain to dorsal horn.
- Usually inhibits pain signals from the periphery.

PAIN ASSESSMENT

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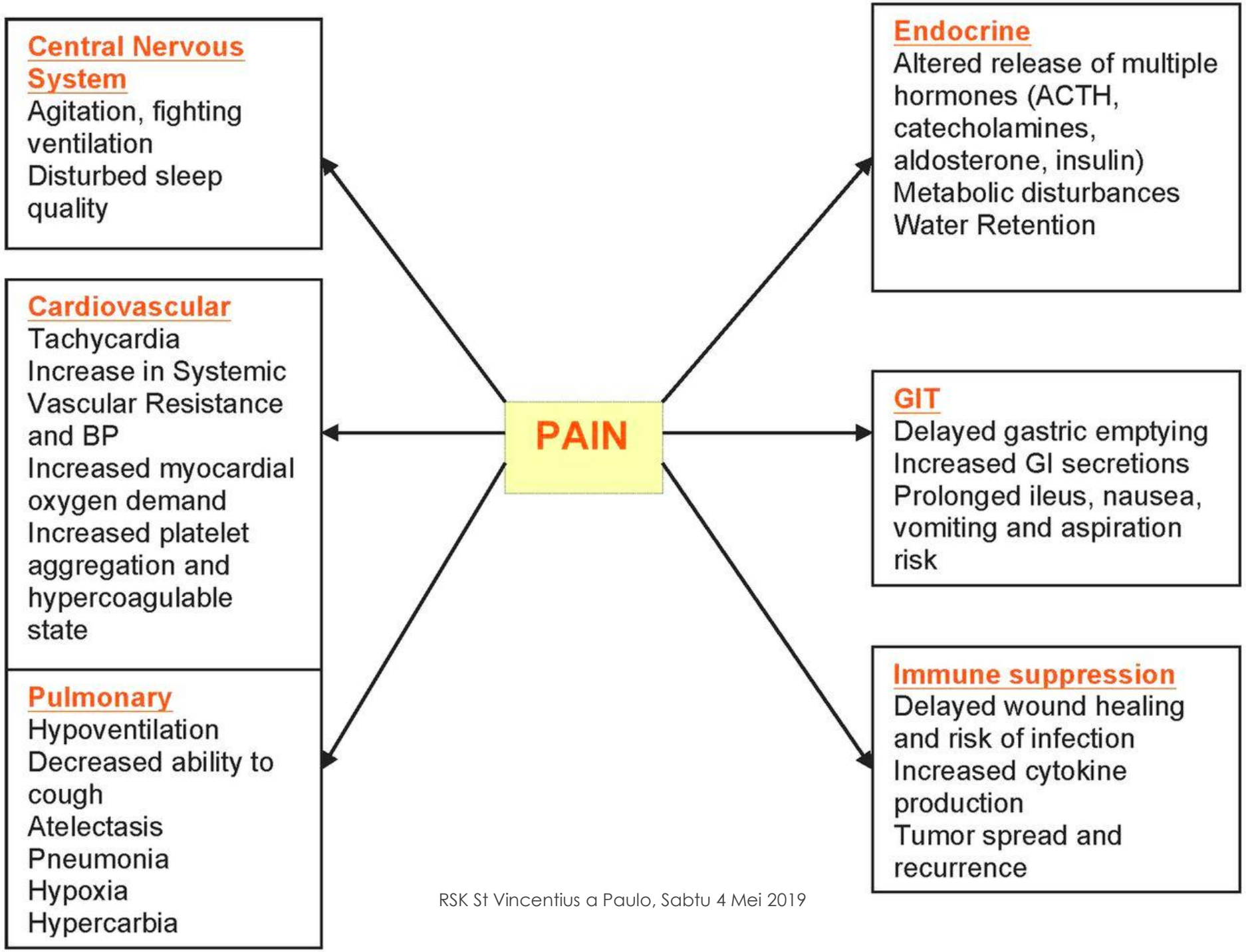

Central Nervous System
Agitation, fighting ventilation
Disturbed sleep quality
Cardiovascular
Tachycardia
Increase in Systemic Vascular Resistance and BP
Increased myocardial oxygen demand
Increased platelet aggregation and hypercoagulable state
Pulmonary
Hypoventilation
Decreased ability to cough
Atelectasis
Pneumonia
Hypoxia
Hypercarbia
PAIN
Endocrine
Altered release of multiple hormones (ACTH, catecholamines, aldosterone, insulin)
Metabolic disturbances
Water Retention
GIT
Delayed gastric emptying
Increased GI secretions
Prolonged ileus, nausea, vomiting and aspiration risk
Immune suppression
Delayed wound healing and risk of infection
Increased cytokine production
Tumor spread and recurrence

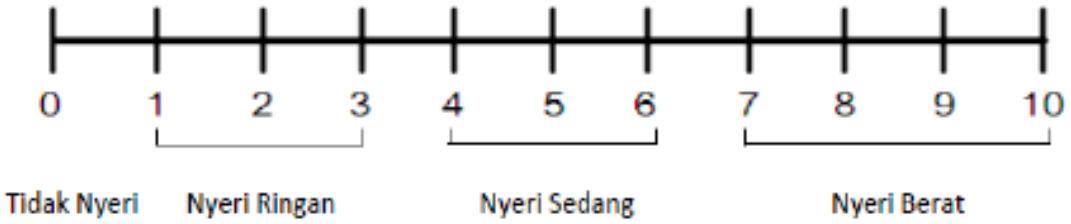
Assessment tools

The Ideal Pain Assessment

- Reproducible across disciplines
- Enables monitoring over time
- Assesses adequacy of interventions
- Easily implemented and monitored

Gambar VAS

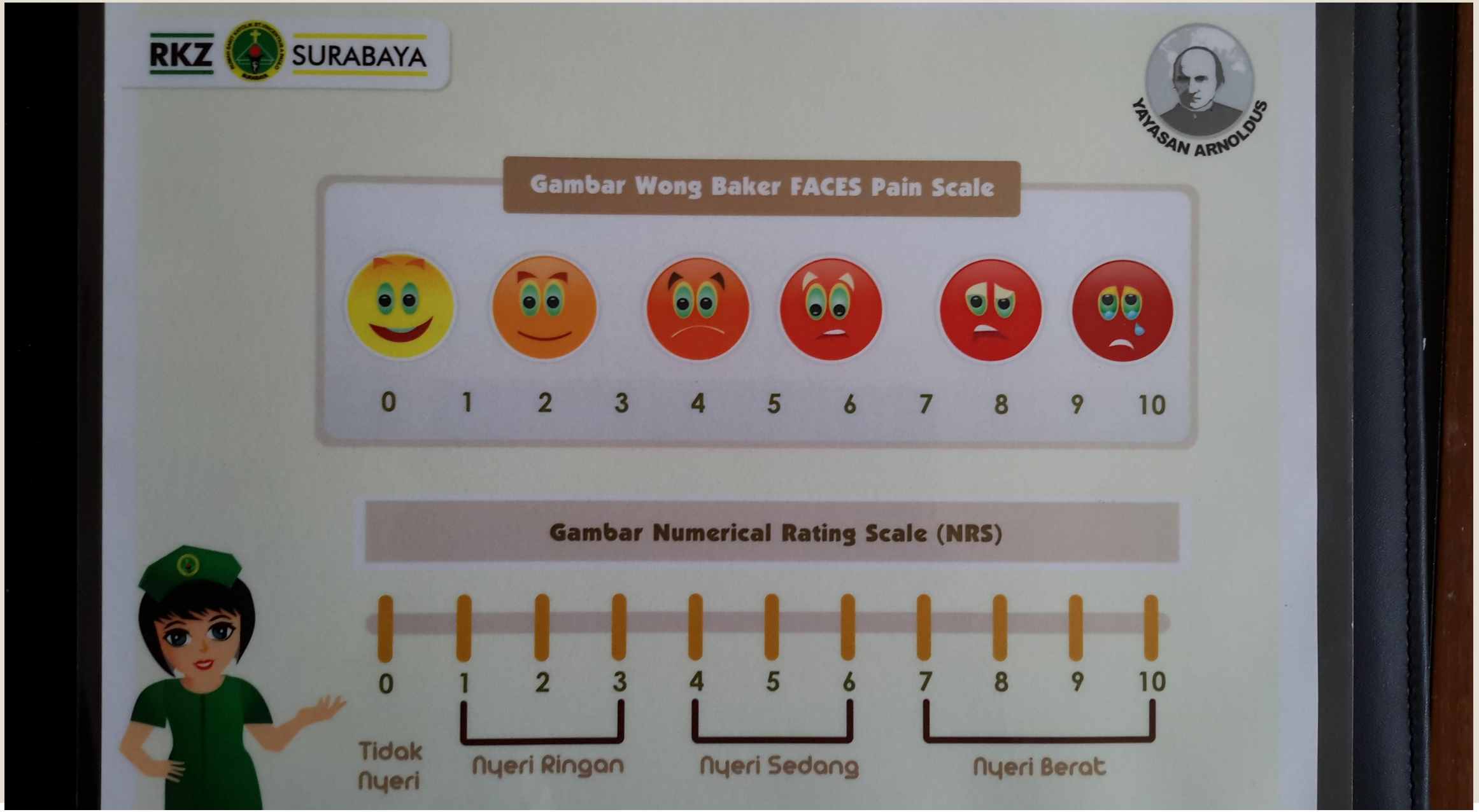
Gambar NRS (Numerical Rating Scale)



Gambar Wong Baker FACES pain scale

Nyeri bila WBFS > 4

NRS / VAS


RKZ
SURABAYA
YAYASAN ARNOLDUS
Gambar Wong Baker FACES Pain Scale
0 1 2 3 4 5 6 7 8 9 10
Gambar Numerical Rating Scale (NRS)
0 1 2 3 4 5 6 7 8 9 10
Tidak Nyeri
Nyeri Ringan
Nyeri Sedang
Nyeri Berat

PAIN MANAGEMENT

RSK St Vincentius a Paulo, Sabtu 4 Mei 2019

Non-Pharmacological Treatments

- **Physical**
  - Rest, ice, compression, elevation (**RICE**)
  - Surgery
  - Acupuncture, massage, physiotherapy

- **Psychological**
  - Explanation
  - Reassurance
  - Counselling

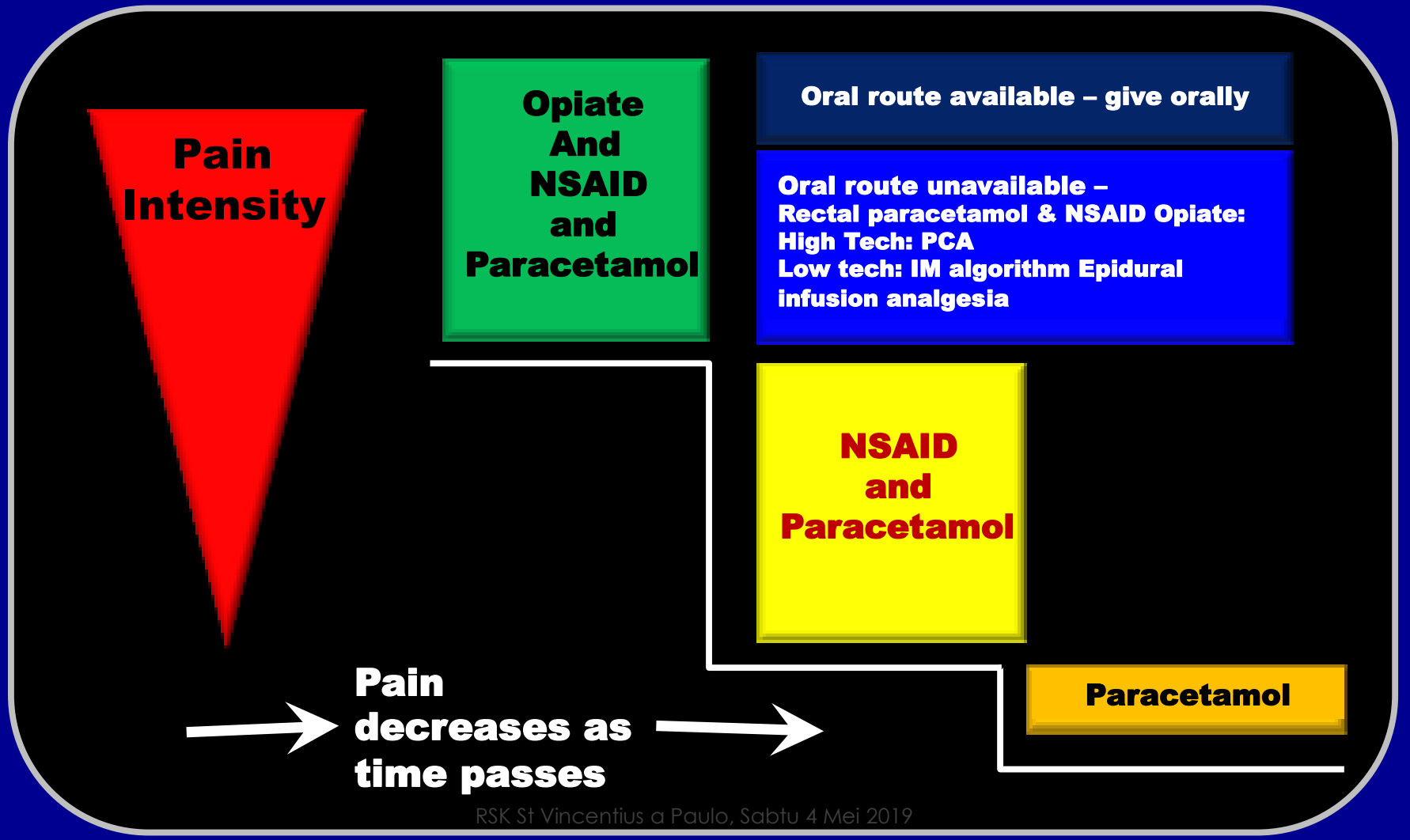
Pharmacological Treatments

- **Simple analgesics**
  - Paracetamol (acetaminophen)
  - Anti-inflammatory medicines, e.g. ibuprofen
- **Opioids**
  - Mild, e.g. codeine, tramadol
  - Strong, e.g. morphine, pethidine, oxycodone

Pharmacological Treatments

- **Other analgesics**
  - Tricyclic antidepressants, e.g. amitriptyline
  - Anticonvulsants, e.g. carbamazepine, gabapentin
  - Local anaesthetics
  - Others, e.g. ketamine, clonidine

Choice of Analgesic Technique (Analgesic Ladder of WFSA)



Paracetamol (Acetaminophen)

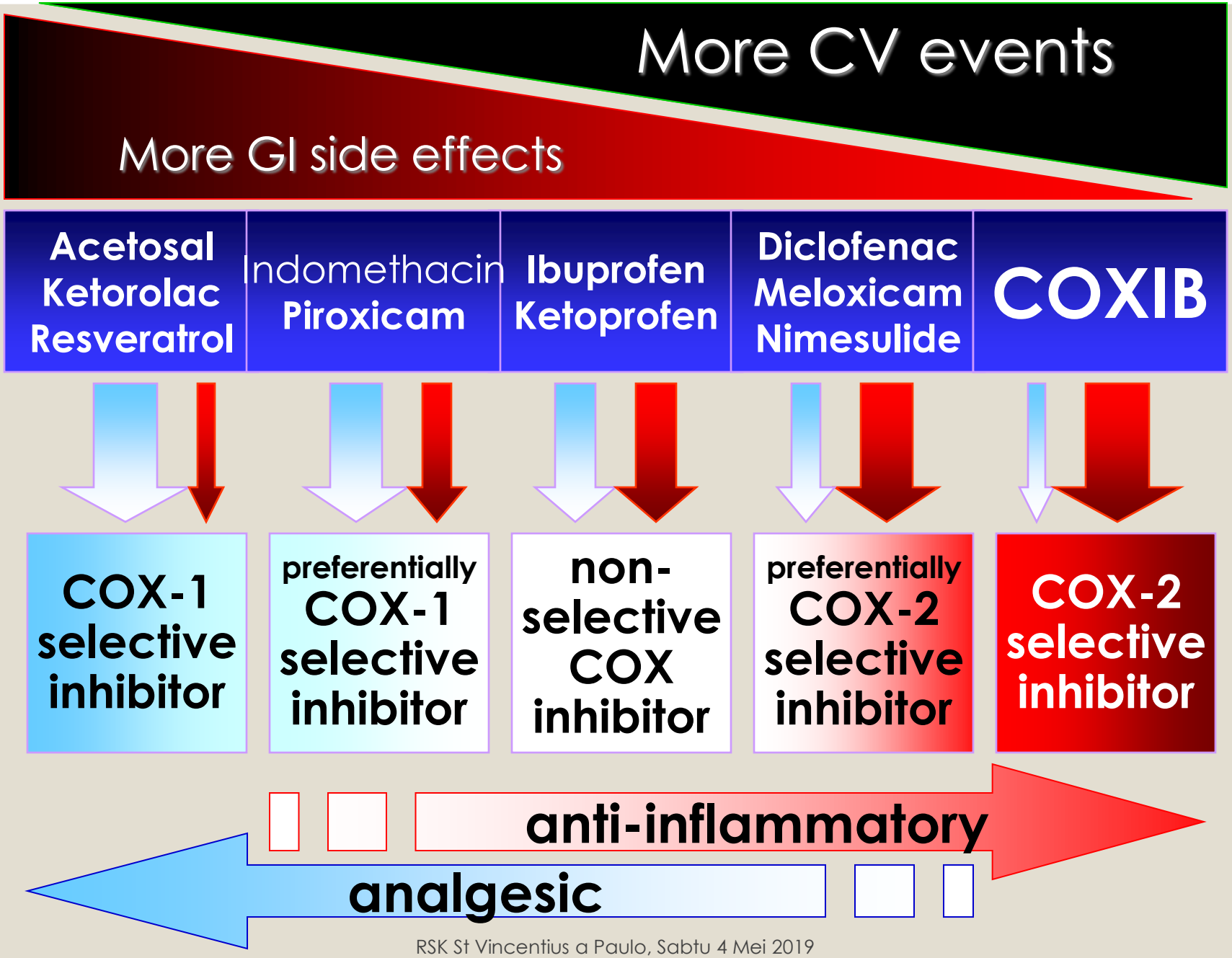
- **Indications**
  - Mild nociceptive pain
  - Moderate to severe nociceptive pain (with other medications)
- **Advantages**
  - Cheap, safe
  - PO, PR, IV
- **Disadvantages**
  - Liver damage in overdose

NSAID

- Indications → Mild, moderate or severe nociceptive pain
- Pros:
    1. Effective Analgesics
    2. Least Expensive
    3. Safe given in short term
- Cons:
    1. Prolonged antiplatelet effects
    2. **Gastric and GI effects**
    3. Renal effects

NSAID

- Given orally maximum 3-5 days, iv maximum 3 days
- Elderly patients → **GI and renal effects >>>**
- **Given with PPI (proton pump inhibitor)**


More CV events
More GI side effects
Acetosal
Ketorolac
Resveratrol
Indomethacin
Piroxicam
Ibuprofen
Ketoprofen
Diclofenac
Meloxicam
Nimesulide
COXIB
COX-1 selective inhibitor
preferentially COX-1 selective inhibitor
non-selective COX inhibitor
preferentially COX-2 selective inhibitor
COX-2 selective inhibitor
anti-inflammatory
analgesic

Tramadol

- **Indications**
  - Nociceptive and neuropathic pain
- **Advantages**
  - Safe
  - Useful for different pain types
  - Can be used with morphine
- **Disadvantages**
  - Nausea and vomiting
  - Confusion

Opioids

- **Indications**
  - Moderate to severe, acute, nociceptive pain
  - Cancer pain

- **Advantages**
  - Very effective
  - Cheap (morphine, pethdine)
  - Usually safe (with caution)
  - PO, IV, IM, SC

Opioids

- **Disadvantages**
  - Vasodilatation → hypotension
  - Cardiac effects (fentanyl → bradycardia)
  - Sedation
  - Nausea and vomiting
  - Respiratory depression in high dose
  - Constipation
  - Neurotoxicity (pethidine)
  - Renal insufficiency
  - Misunderstandings about addiction
  - Legal controls

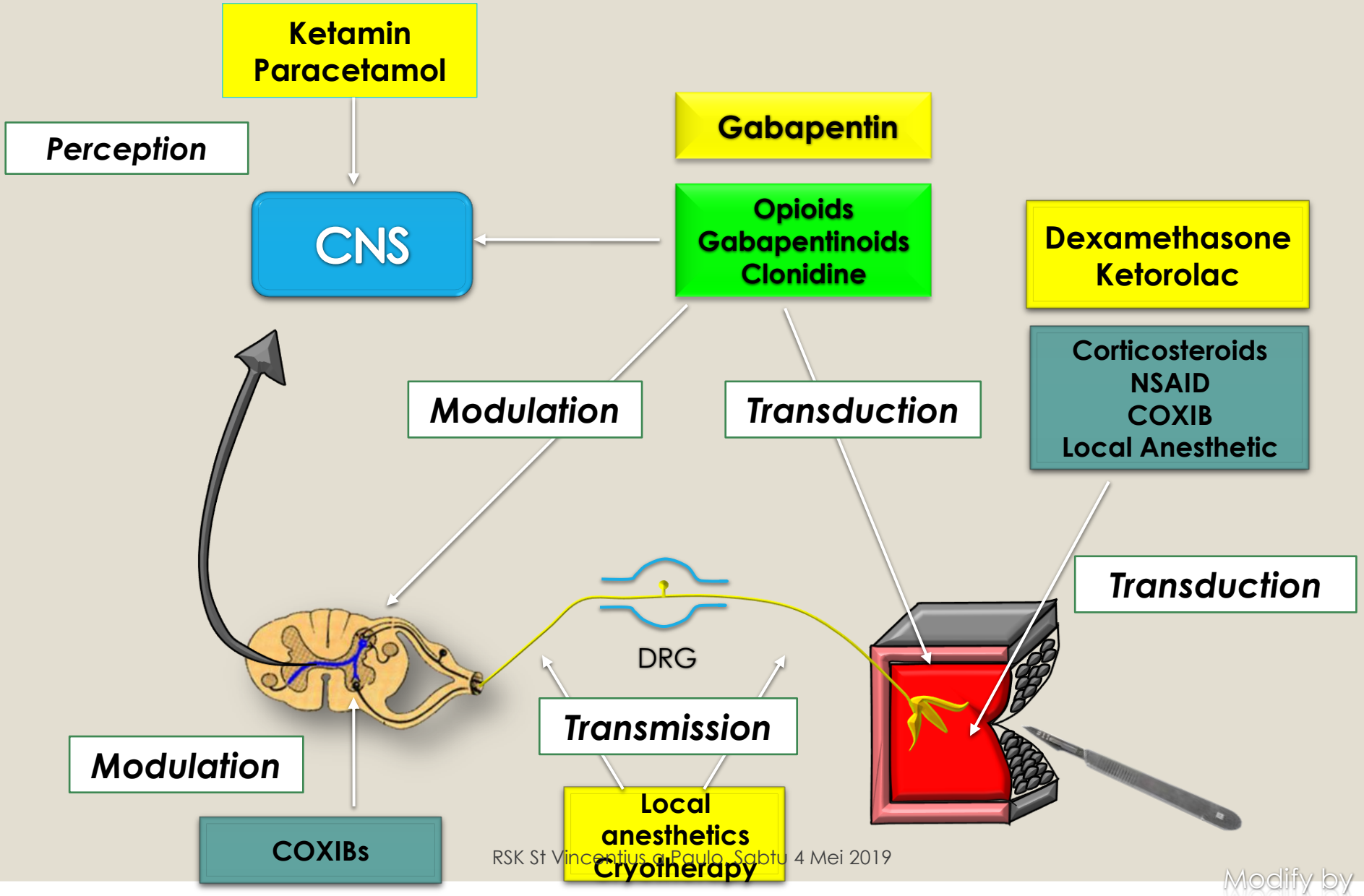
Others

- Block with regional analgesia, infiltration or PNB → inflammation
- PCA or PCEA

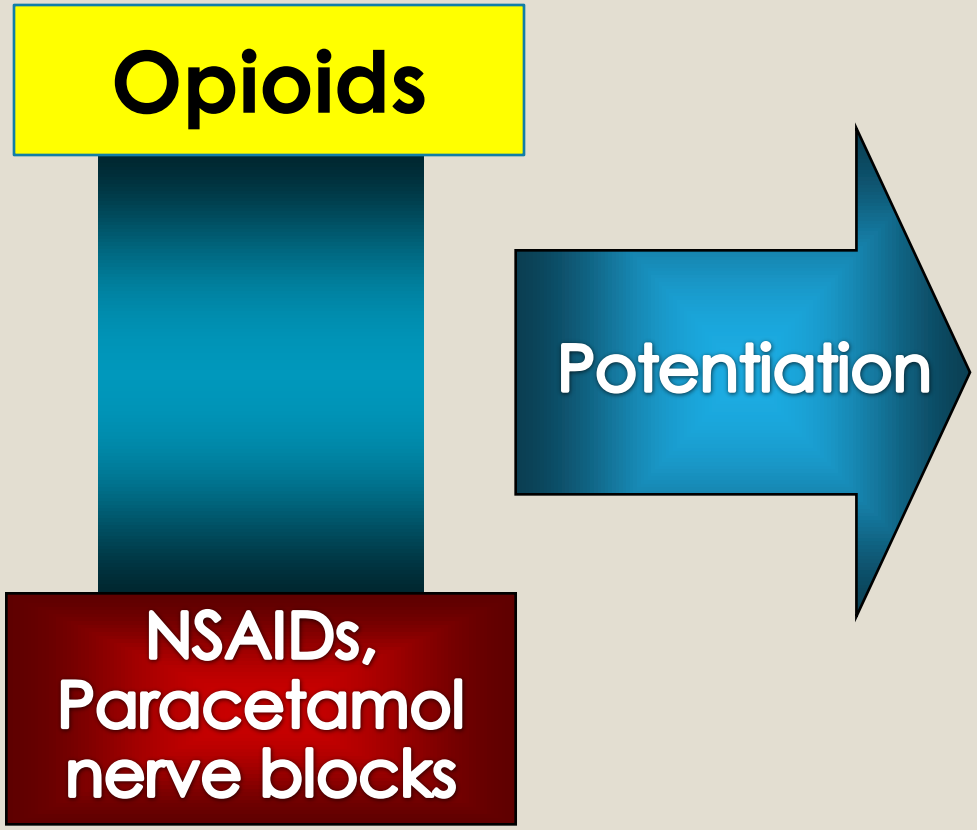
Penanganan Obat

	Acute, nocice mild	Acute, nocicep, severe	Acute, neuropat	Chronic, non-cancer	Chronic cancer
Paracetamol	+++	++	+	+	+
NSAID	++	++	+	±	±
Codeine	++	+			+
Morphine		+++	++	-	+++
Amitriptyline	-	-	++	++	++
Carbamazepine	-	-	++	+	+

Target Point of Analgesic Agents



Benefits of Multimodal Analgesia



- **REDUCED DOSES of each analgesic**
- **IMPROVED EFFICACY due to synergistic or additive effects**
- **REDUCE SIDE EFFECTS of each drug**

Kehlet H et al. *Anesth Analog*. 1993;77:1048-1056.

Common pain syndromes in elderly

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- Gout

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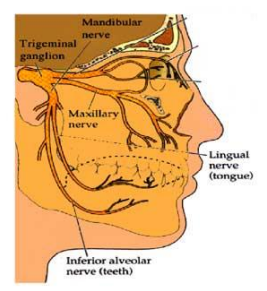


REASONS PATIENTS MAY NOT REPORT PAIN

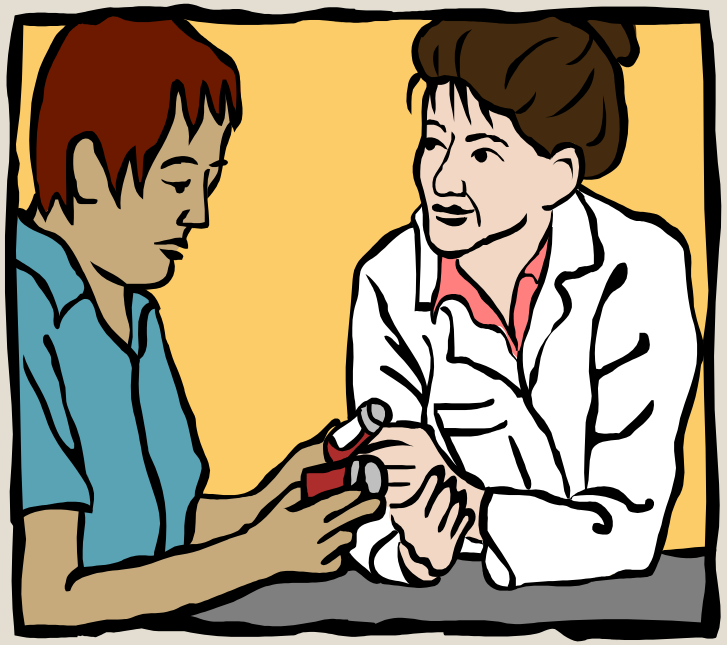
- Fear of diagnostic tests
- Fear of medications
- Fear meaning of pain
- Perceive physicians and nurses too busy
- Complaining may effect quality of care
- Believe nothing can or will be done

There is a lot we can do to relieve pain!

- Analgesic drugs
- Non-drug strategies
- Specialized pain treatment centers
- Patient and caregiver education and support

Analgesic Drugs

- Acetaminophen
- NSAIDs
  - **Non-selective COX inhibitors**
  - **Selective COX-2 inhibitors**
- Opioids
- Others
  - **Antidepressants**
  - **Anticonvulsants**
  - **Substance P inhibitors**
  - **NMDA inhibitors**
  - **Others**



In Geriatric → **physiological changes**

- Anatomical changes
- Pharmacokinetics → difference
- Pharmacodynamic changes

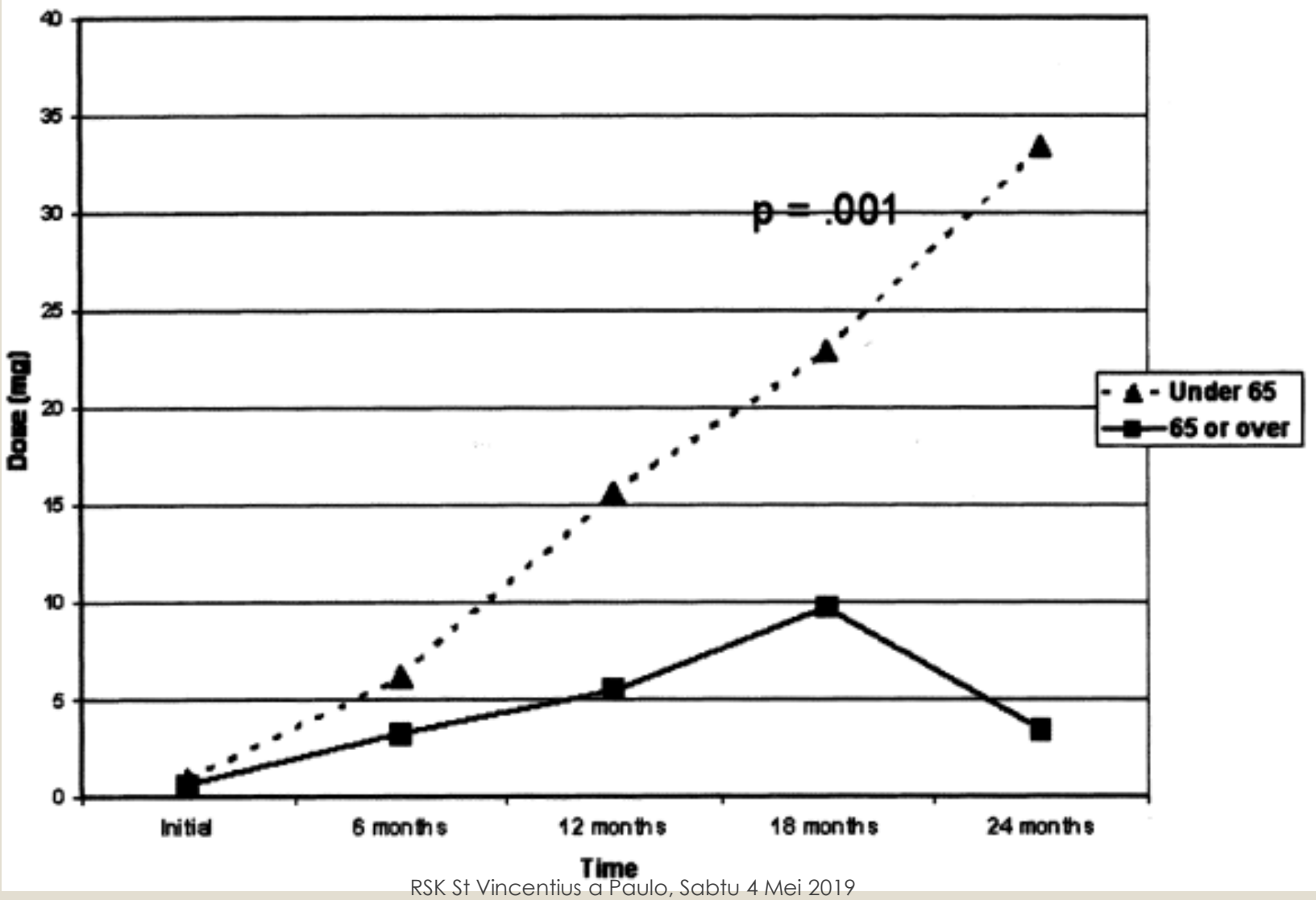
A Brief Review…

- Pharmacodynamics
  - Change with age
    * numbers of receptors
    * sensitivity of receptors
    * Counter regulatory mechanisms
  - Increase in receptor response is noted with opioids
  - Not as well understood as pharmacokinetics

A Brief Review, (cont'd)

- Pharmacokinetics
  - Absorption
    - overall unchanged
  - Distribution
    - increased Vd for lipophilic drugs
  - Metabolism
    - generally prefer phase 2, less interaction and active metabolites
  - Elimination
    - decreased renal function

Age related → dose in Cancer patients being given intra-thecal morphine



Do Not Use Placebo !!!

- Unethical in clinical practice
- They don’t work
- Not helpful in diagnosis
- Effect is short lived
- Destroys trust

Non-Drug Strategies

- Exercise
  - PT, OT, stretching, strengthening
  - general conditioning
- Physical methods
  - ice, heat, massage
- Cognitive-behavioral therapy
- Chiropracty
- Acupuncture
- TENS
- Alternative therapies
  - relaxation, imagery
  - herbals

PATIENT AND CAREGIVER must be educated in Geriatric patient management

- Diagnosis, prognosis, natural history of underlying disease
- Communication and assessment of pain
- Explanation of drug strategies
- Management of potential side-effects
- Explanation of non-drug strategies

Take Home Messages

- Pain is when the patients say hurts
- Pain Assessment is a MUST for every patients in the hospital
- Non pharmacology treatment can reduce the pharmacology treatment
- Choose multimodal analgesia
- Be careful with elderly patients


STOP
THE PAIN


Thank You
To Cure Occasionally
To Relieve Often
To Comfort Always
ANONYM
16th CENTURY