

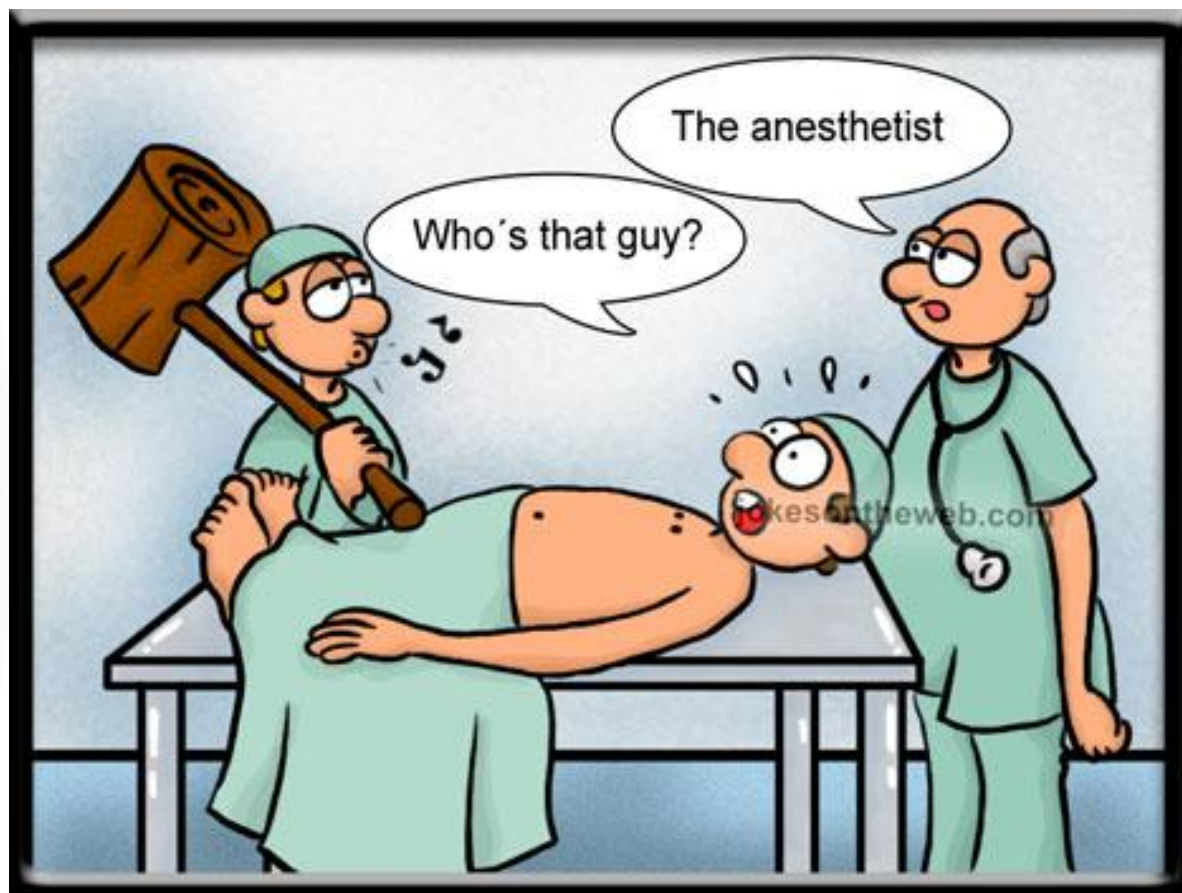
尊重生命·人本醫療

佛教大林慈濟綜合醫院   
Buddhist Da Lin Tzu Chi General Hospital

# 疼痛之藥物治療

慈濟醫院大林分院麻醉科 陳炳碩醫師

# “麻” “醉”



# 大綱

- 疼痛理論
- 臨床治療概論
- 藥物介紹
- 其他治療



# 什麼是“疼痛”？



- IASP 世界疼痛醫學會 (1994)
- Pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”

(身體組織受損引起的身心不適感)



## 疼痛不是理所當然

疼痛是每個人都不免經歷過的感覺，不僅是身體上的折磨，更使人的生活品質及情緒狀態大受影響，特別是在發生一些疾病、手術開刀、慢性頑固性疼痛甚至生產疼痛等較嚴重的情形。許多人將忍受疼痛視為理所當然，不會開口主動去尋求止痛的對策，醫護人員甚至病患的家屬便也忽略了病患的疼痛，以及所造成的不適與不便。如果您或您的家人正在受疼痛所苦，您就必須要尋求醫師的協助。千萬別忘記：您有拒絕疼痛的權利。



## 忍受疼痛的後果

疼痛會造成您生理、心理及社會功能上的挫折。

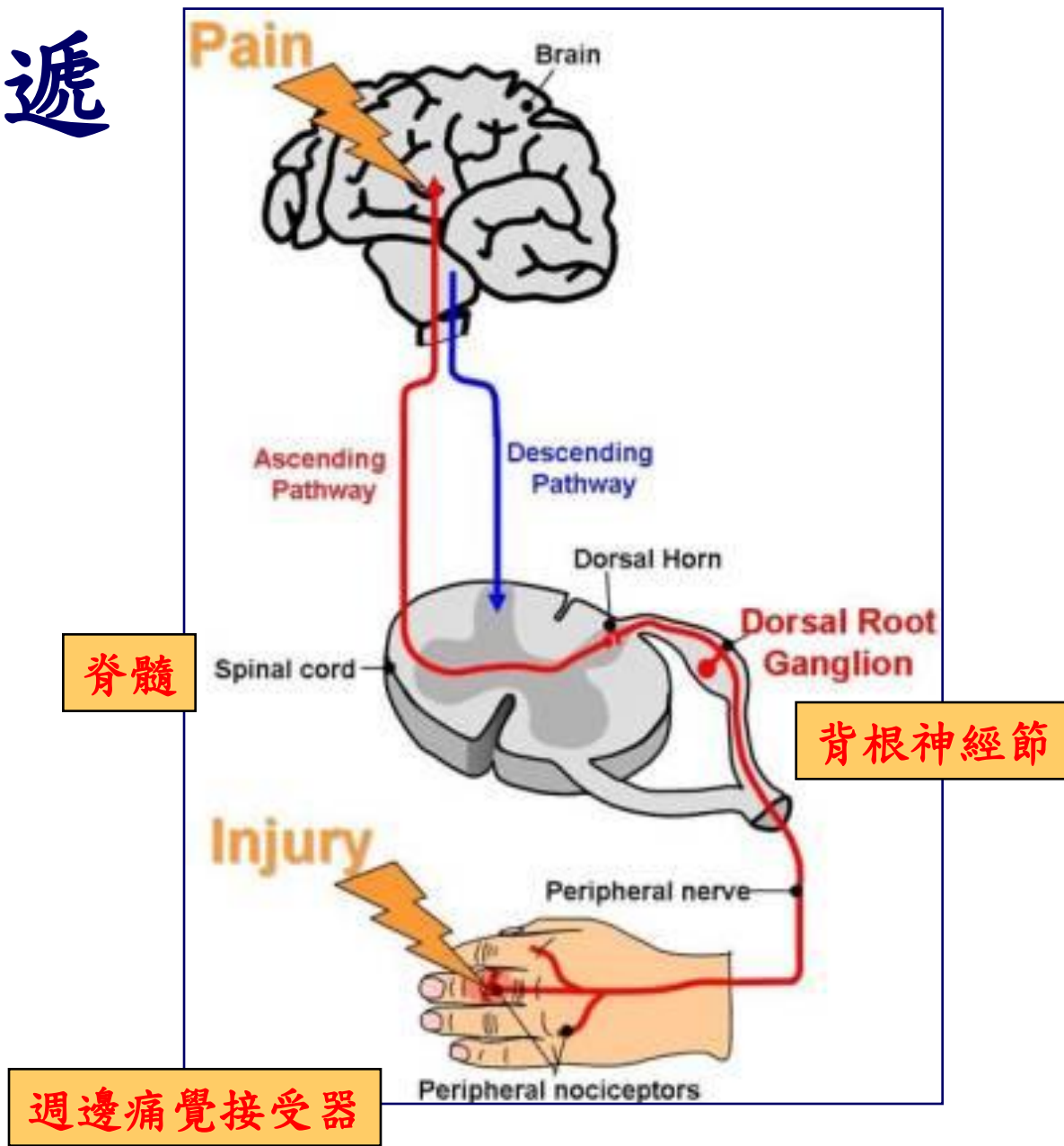
**生理上：**心血管系統壓力增加、內分泌失調、肌肉過度僵硬收縮影響傷口癒合、影響睡眠品質。

**心理上：**情緒低落、易怒、緊張，以及因害怕再度受傷，而無法儘快回到工作崗位或恢復日常生活。

若能夠消除疼痛的感覺，必能早日恢復平日的生理狀態及愉悅心情，使您早日回歸正常生活，進行工作或陪伴親愛的家人。



# 痛覺之傳遞



# 疼痛之分類

## ■ 依時間 (Duration) 區分

### Acute (急性) < 1 個月

組織受到傷害

神經系統之活化

疼痛隨組織癒合而漸減

對身體有保護作用

### Chronic (慢性) > 3~6 個月

受傷組織癒合後疼痛依然存在

通常無保護作用

對身體功能反而有害





# 疼痛之分類

- 依發生機制 (Mechanism) 區分

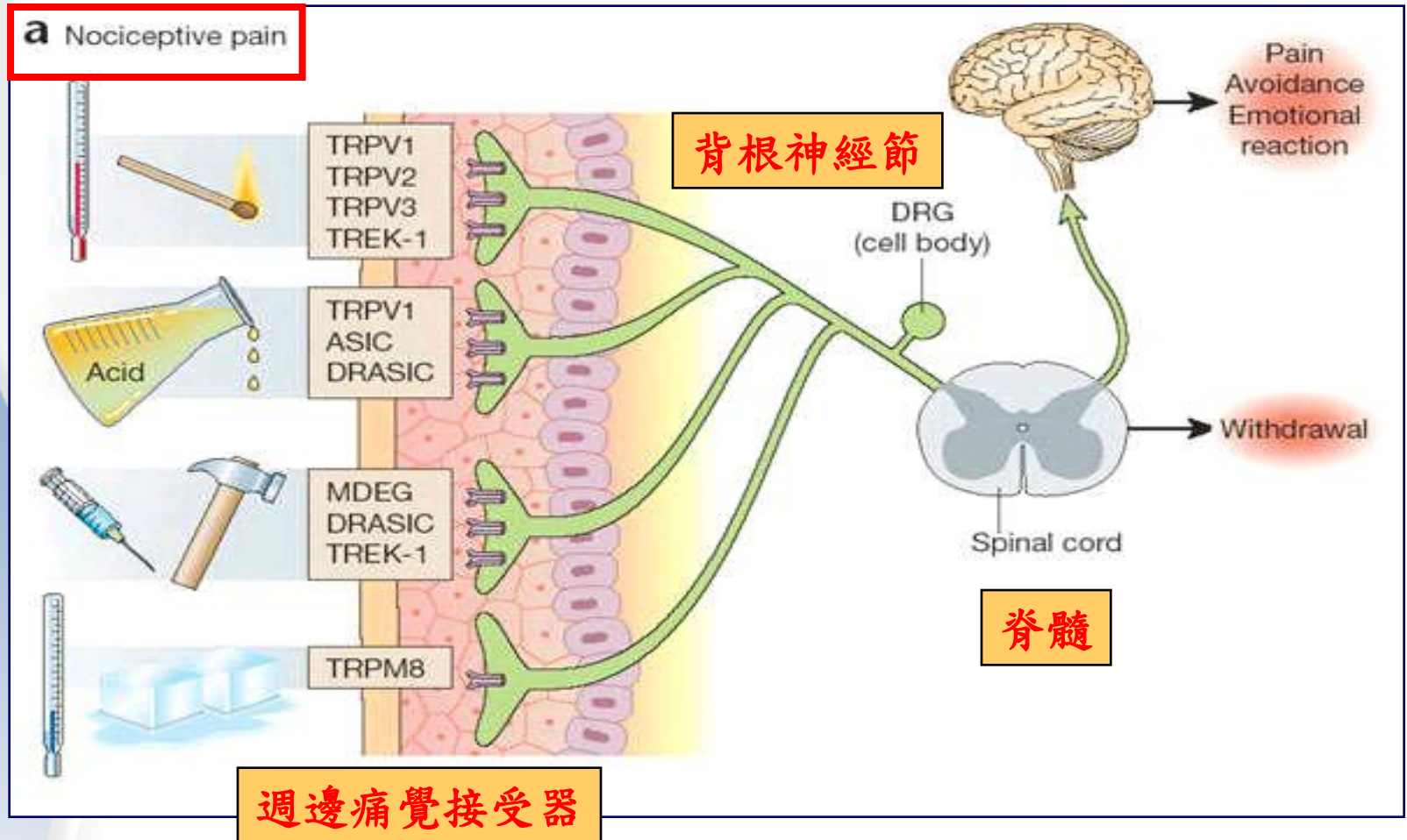
Nociceptive

Inflammatory (發炎)

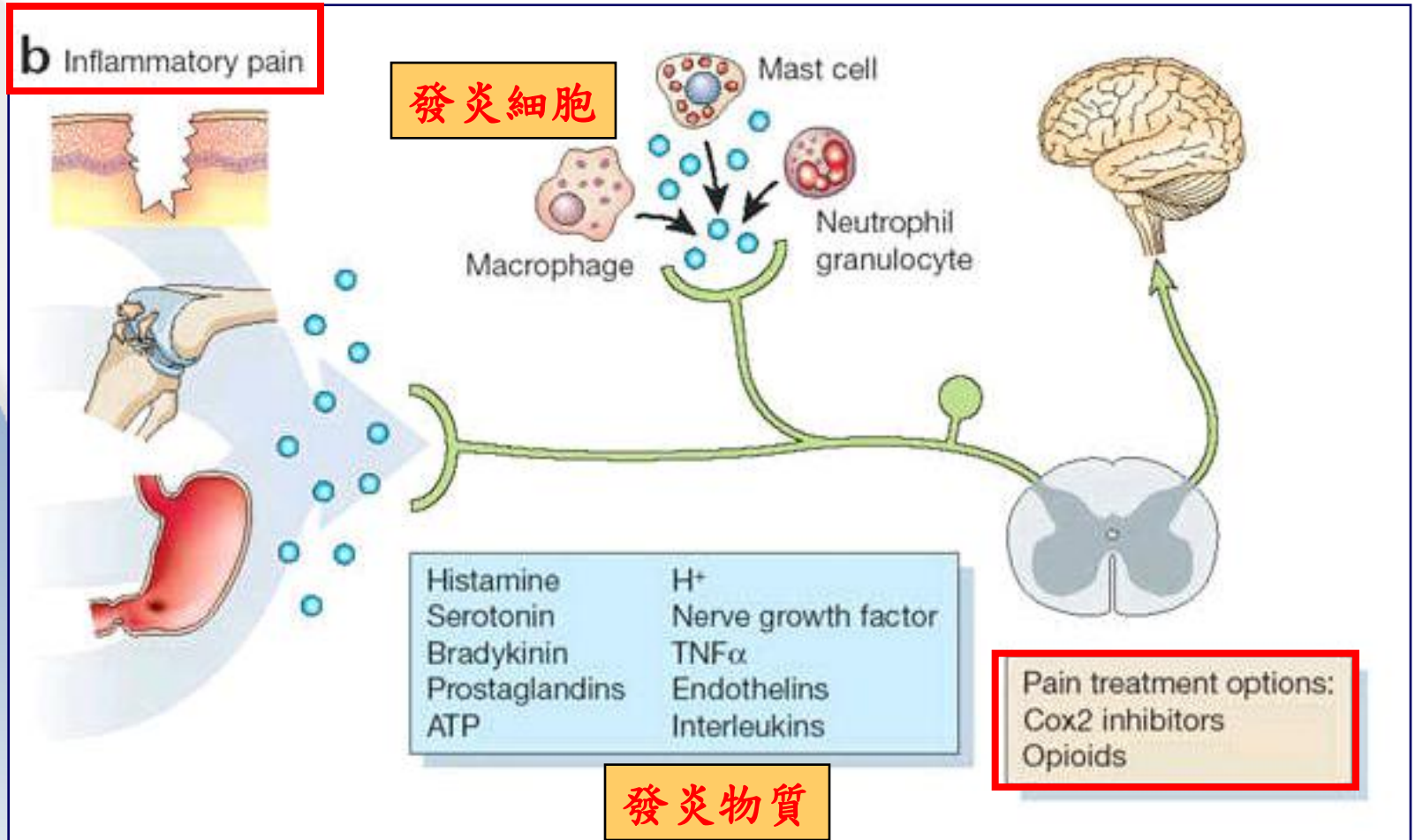
Neuropathic (神經病變)



# 疼痛分類(1)



# 疼痛分類(2)



# 疼痛分類(3) - 神經病變性

## C Neuropathic pain



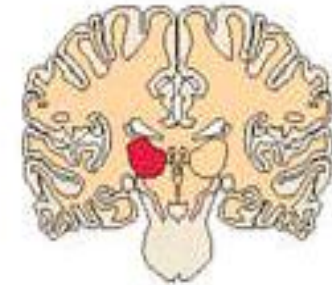
Carpal tunnel syndrome

腕道症候群

脊髓損傷



Spinal cord injury



Thalamic stroke

中風

治療藥物

Pain treatment options:  
Tricyclic antidepressants  
Anticonvulsants  
Na<sup>+</sup> channel blockers  
NMDA receptor antagonists  
Opioids

Debbie Maizels

# 神經病變性疼痛

- 神經系統 (包含週邊與中樞) 之疾病或傷害所導致

- 週邊神經系統

外傷 – 手術、截肢、神經壓迫

代謝障礙 – 糖尿病、尿毒症

感染 – 帶狀疱疹、AIDS

毒素 – 化療藥物、酒精

血管疾病 – SLE

營養不良 – 維生素缺乏

癌症 – 轉移、浸潤



# 神經病變性疼痛

- 中樞神經系統

中風

脊髓病變或損傷

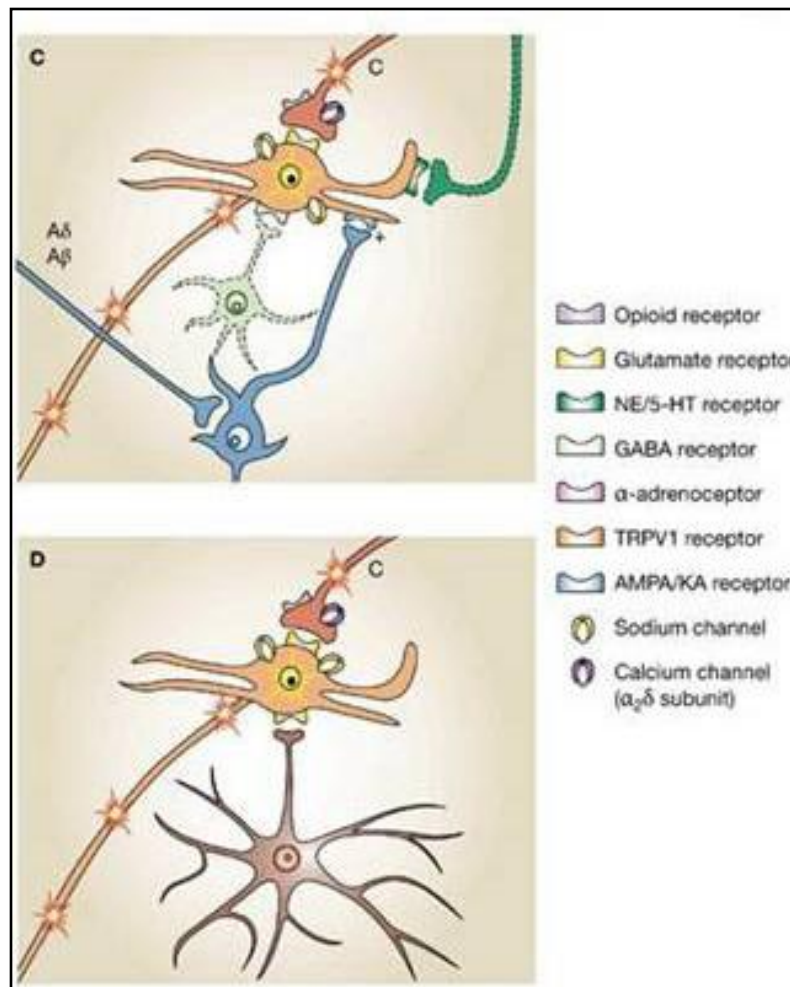
多發性硬化 (Multiple sclerosis)

腫瘤



# 神經病變性疼痛

- 症狀多樣化
- 機制複雜
- 多種藥物治療
- 治療效果不理想



# 大綱

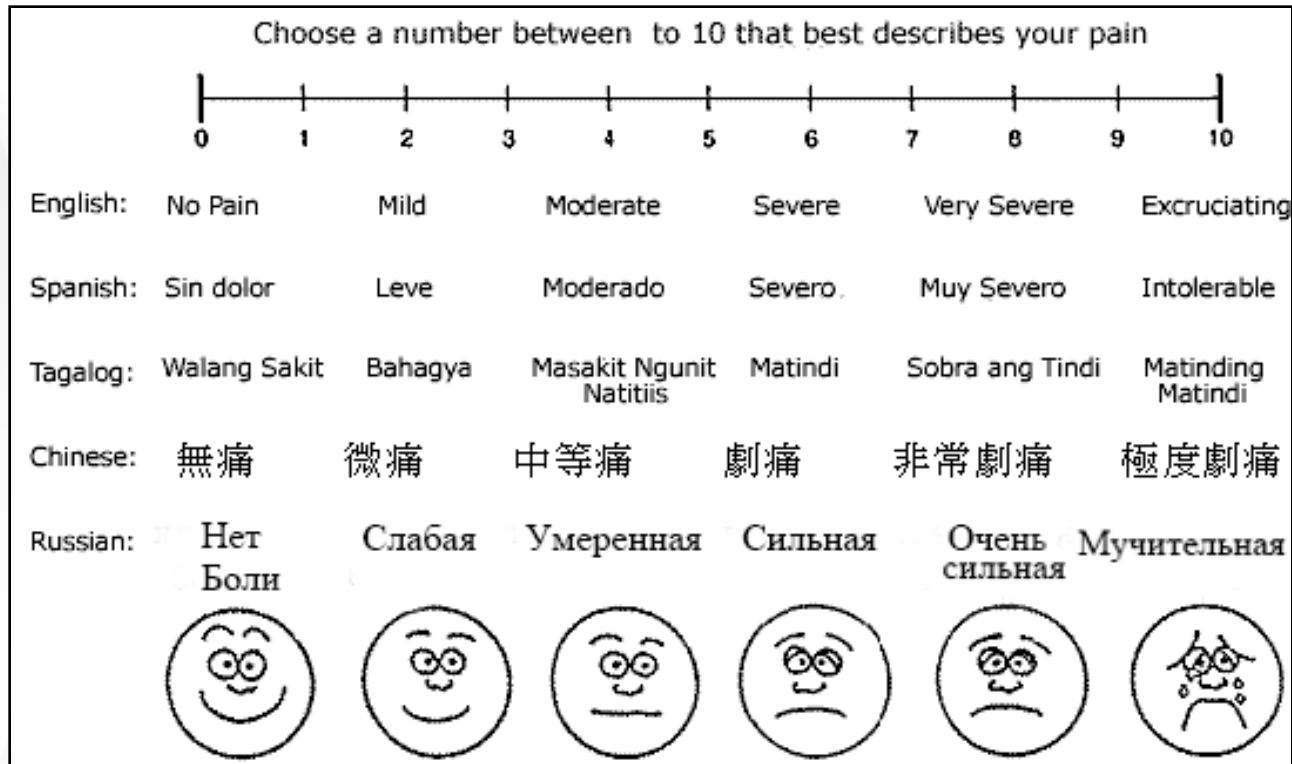
- 疼痛理論
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# 疼痛之評估

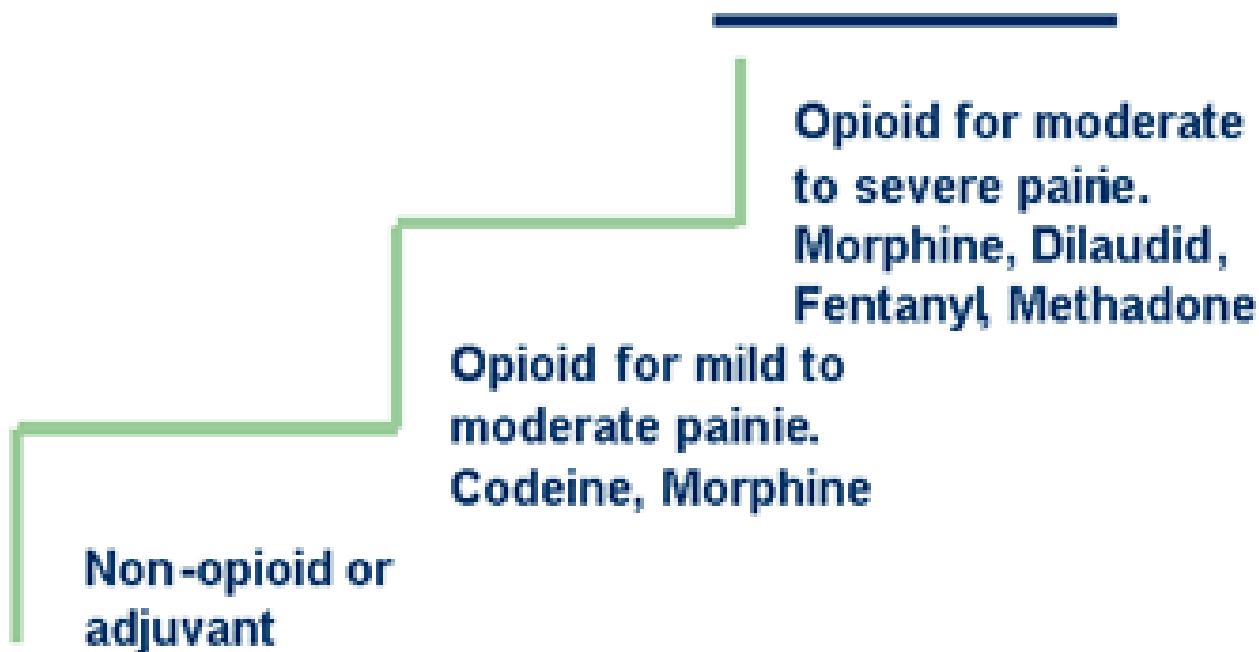
## Numeric pain intensity scale



## Visual analog scale (VAS)

# 疼痛治療準則

## WHO Analgesia Ladder



**LEADING ARTICLE**

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Drugs 2007; 67 (15): 2121-2133  
0012-6667/07/0015-2121/\$49.95/0

# Recent Advances in the Pharmacological Management of Pain

*Josée Guindon,<sup>1</sup> Jean-Sébastien Walczak<sup>1</sup> and Pierre Beaulieu<sup>1,2</sup>*

1 Department of Pharmacology, Faculty of Medicine, Université de Montréal, Montréal, Québec, Canada

2 Department of Anesthesiology, Faculty of Medicine, Université de Montréal, Montréal, Québec, Canada

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# 治療疼痛之藥物

**Table I.** Drugs commonly used in the treatment of pain: classical analgesics and new adjuvants

**Opioids:** alfentanil, buprenorphine, butorphanol, fentanyl, hydromorphone, pethidine (meperidine), methadone, morphine, nalbuphine, oxycodone, remifentanil, sufentanil, tramadol

**NSAIDs:** diclofenac, ibuprofen, ketoprofen, ketorolac, naproxen

**Coxibs<sup>a</sup>:** celecoxib, etoricoxib, lumiracoxib, parecoxib

**Antidepressants:** bupropion, duloxetine, imipramine, venlafaxine

**Antiepileptic drugs:** gabapentin, lamotrigine, pregabalin

**Cannabinoids:** ajulemic acid, cannabis,  $\Delta^9$ -tetrahydrocannabinol/cannabidiol, dronabinol, nabilone

**Local anaesthetics:** bupivacaine, levobupivacaine, lidocaine 5%, ropivacaine

**Others:** clonidine, ketamine, nefopam, neostigmine, paracetamol (acetaminophen)

a Selective cyclo-oxygenase type 2 inhibitors.

抗憂鬱藥物  
抗痙攣藥物

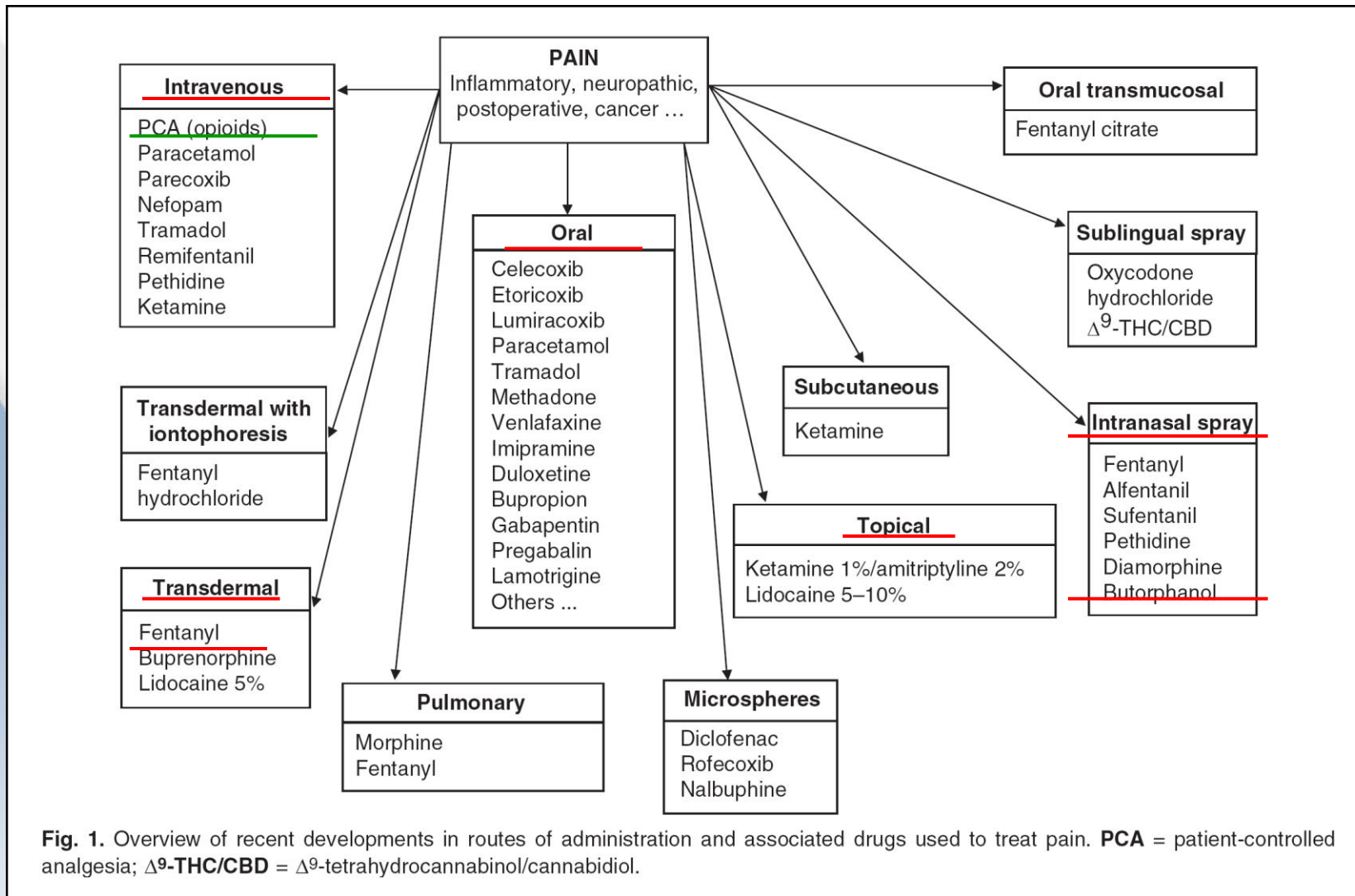


# 影響疼痛治療之因素

**Table II.** Multiple factors influencing drug treatment of pain

Cultural belief	文化信仰
Personal experience	個人經驗
Medical history	疾病史
Pain intensity	疼痛強度
Reduced work status	工作類型
Interference with meaningful activity	對活動之影響
Other diseases interacting	其他疾病
Drug-drug interactions	藥物交互作用
Toxicity	藥物毒性
Cost	藥物價格
Patient acceptance and compliance	接受度與順從性
Patient expectations and beliefs about the cause of pain	對治療之期待

# 疼痛藥物給予之途徑



# 大綱

- 疼痛理論
- 臨床治療概論
- **藥物介紹**
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Figure 2 : Biosynthesis of eicosanoids

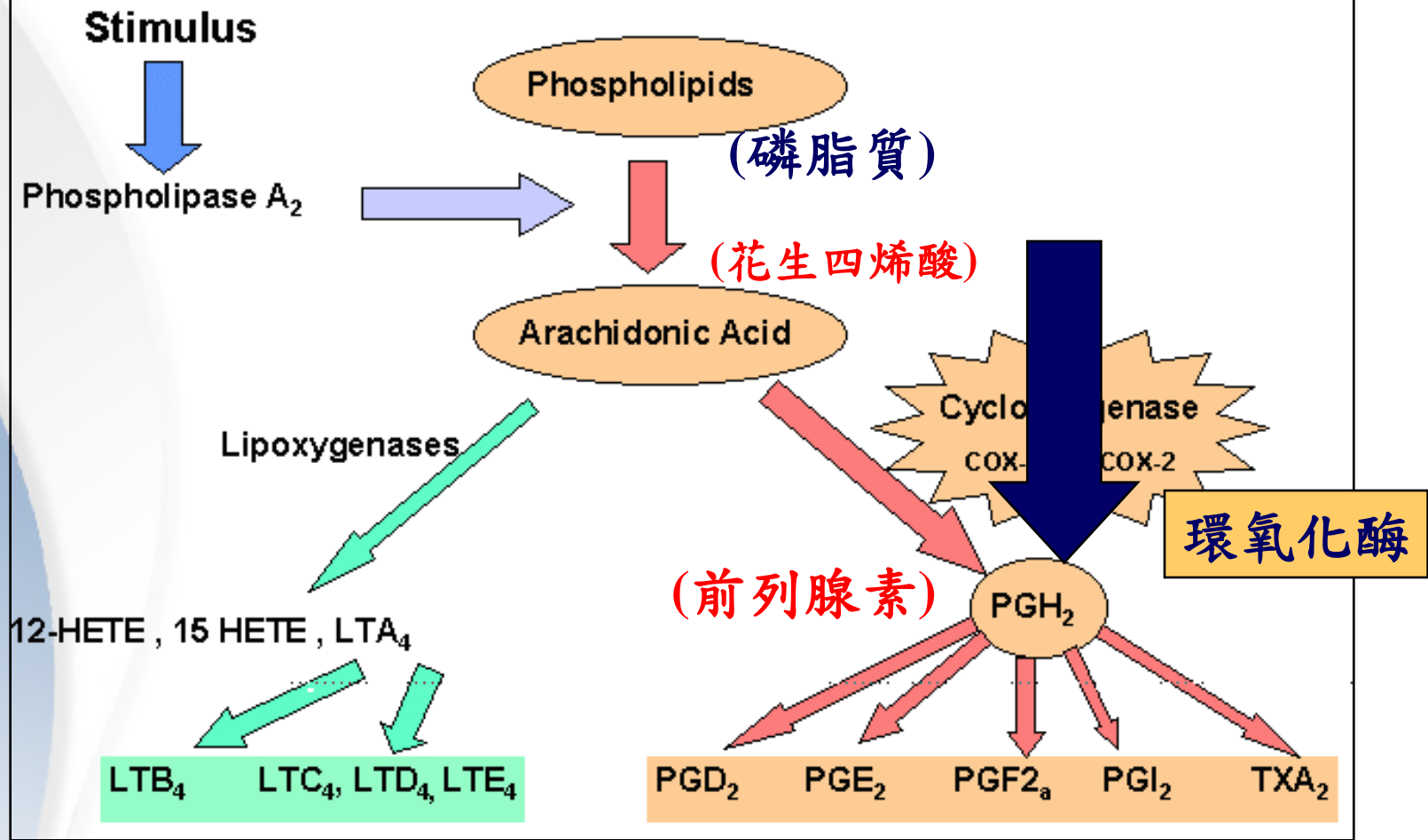
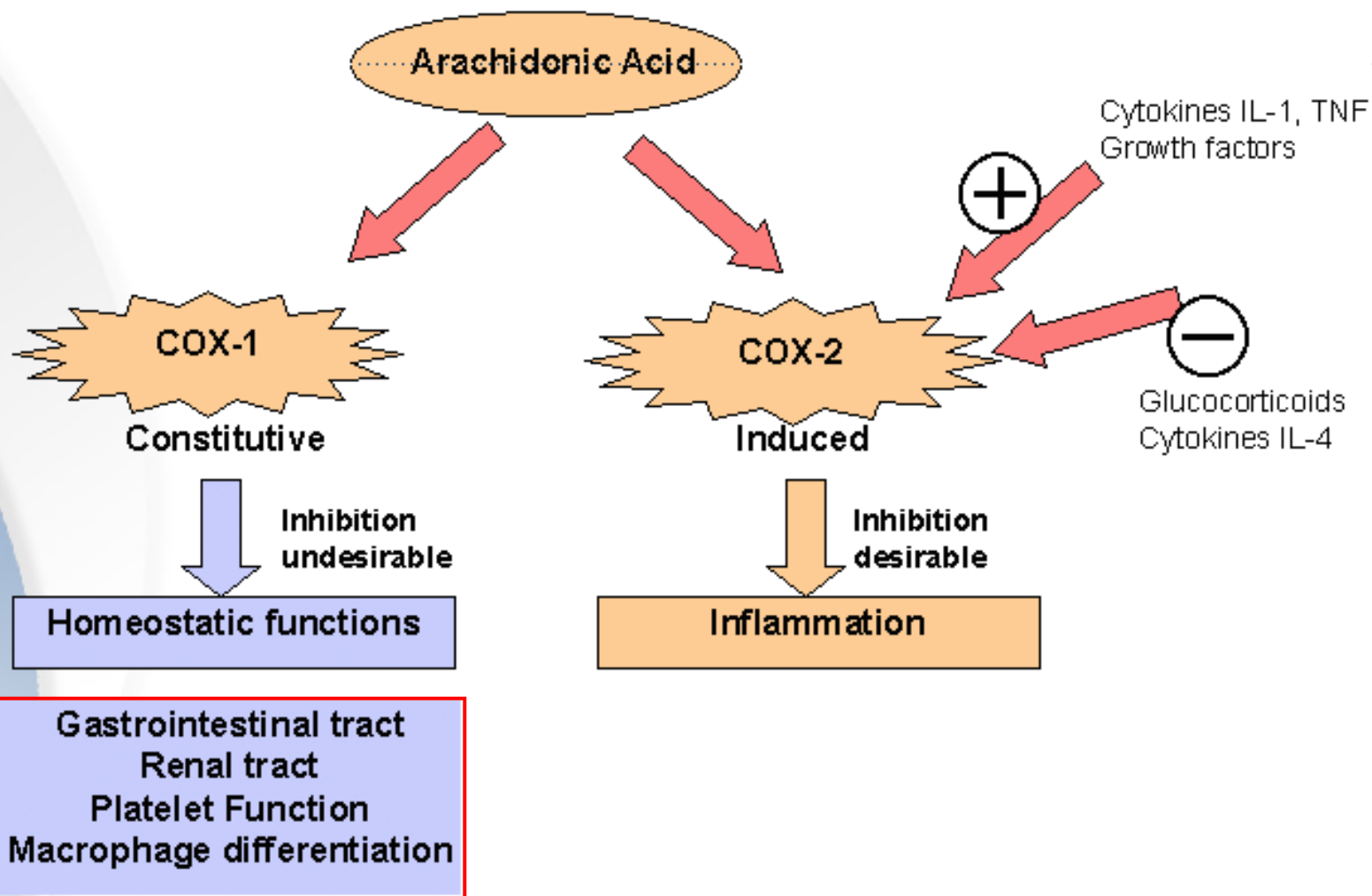




Figure 3: The Current COX concept



# 疼痛治療藥物

- **Aspirin (Acetylsalicylic acid, ASA)**
  - Nonselective & irreversible inhibitor of COX (adverse effects)  
(抑制環氧化酶)
  - Analgesic and anti-inflammatory (止痛、消炎作用)
  - Benefits in addition to analgesia (anti-pyretic, anti-platelet)  
(解熱、抑制血小板凝集)
  - Analgesic ceiling
  - **Reye's syndrome**



<b>Usual dose</b>	<b>Effect</b>
80~160 mg	Anti-platelet
325~1000 mg	Analgesic, antipyretic
325 mg~6 grams	Anti-inflammatory, tinnitus
6~10 grams	Respiratory alkalosis
10~20 grams	Fever, dehydration, acidosis
> 20 grams	Shock, coma



# 疼痛治療藥物

- **Acetaminophen (Panadol<sup>®</sup>, Tylenol<sup>®</sup> or Scanol<sup>®</sup>)**
  - Analgesic but not anti-inflammatory
  - Low effect on peripheral COX
  - Few drug-drug interactions
  - Analgesic ceiling
  - **Liver toxicity (肝臟毒性)**



# 疼痛治療藥物 - NSAIDs

- 非類固醇抗發炎藥物 (NSAIDs)

- Non-COX-II selective :

Indomethacin (Inteban<sup>®</sup>)

Diclofenac (Cataflam<sup>®</sup> or Voltaren<sup>®</sup>)

Ketorolac (Keto<sup>®</sup>)

Ibuprofen, Naproxen, Piroxicam, Sulindac, Others

治療肌肉或關節疼痛、牙痛、經痛、手術後疼痛

NSAIDs 減少 morphine 使用量與副作用

- (1) provide a documented 30-50% morphine-sparing effect
- (2) improve analgesia when co-administered with morphine PCA
- (3) decrease PONV by 30% and sedation by 29%



# 疼痛治療藥物 - NSAIDs

- 非類固醇抗發炎藥物 (NSAIDs)

- COX-II selective :

Etodolac (Lonine<sup>®</sup>)

Meloxicam (Mobic<sup>®</sup>)

Celecoxib (Celebrex<sup>®</sup>)

Nimesulid (Nimed<sup>®</sup>)

Rofecoxib (Vioxx<sup>®</sup>) : cardiovascular effects (leading to MI or stroke)

Valdecoxib (Bextra<sup>®</sup>) : serious cutaneous adverse reactions

Reserved for those

- (1) who do not respond to traditional NSAIDs (傳統藥物效果不佳)
- (2) who have an increased risk of GI complications (腸胃道病史)
- (3) with low CV risk (心血管風險低)



# 疼痛治療藥物 - NSAIDs

- 副作用

過敏反應

腸胃道出血 (COX-II 長期使用仍會有)

凝血功能異常 (抑制血小板功能) (增加血栓形成危險性)

腎臟血流減少 (抑制前列腺素合成)

- Topical NSAIDs (Diclofenac : Voren Gel®)

作用直接、副作用較少



# 疼痛治療藥物 - NSAIDs

痛藥致休克 將加警語 【陳柏因／台北報導】 (2008-01-11)

衛生署藥政處昨公布用於治療短期疼痛、含有 Ketorolac 成分的非類固醇消炎止痛藥，必須在四月十日前變更藥品仿單（說明書），新仿單必須加註警語，提醒注意過敏性休克的風險。

## 術後病患常使用

衛生署藥政處長廖繼洲表示，國內藥物不良反應通報系統，十年來共接獲七件因使用這類藥物發生過敏性休克案例，其中四例死亡。藥政處日前邀集專家開會後決定仿單須新增警語，包括使用注射劑型時須有急救設備，半小時內應有人監控病患安全等。義大醫院關節重建科主任顏政佑表示，該藥注射型多用於外科及骨科的病患，術後止痛所用。國內約有一半術後須止痛的病患會使用到該類藥品，而口服藥則多用於風濕科急性疼痛病患，臨床應用相當廣泛，但衛署至今只接獲七例不良反應通報，件數很少，民眾不必恐慌。





# 疼痛治療藥物 - Opioids

- 鴉片類止痛藥 (Opioids, opiates, narcotics)
- Morphine, Meperidine (Demerol, Pethidine), Fentanyl, Codeine, etc.
- Morphine 10 mg or 20 mg / 1 mL (IV or IM)  
Morphine 10 mg (oral) 口服速效型  
MS contin (MST) 30 or 60 mg (oral) 口服長效型  
Morphine solution
- Demerol 50mg / 1 mL (injection)  
Demerol 50 mg (oral)



# 疼痛治療藥物 - Opioids

## ■ 鴉片類止痛藥常見之副作用

呼吸抑制 (respiratory depression)

嗜睡 (excessive sedation)

便秘 (constipation)

皮膚搔癢 (pruritus)

尿液滯留 (urinary retention)

噁心嘔吐 (nausea and vomiting)



# 疼痛治療藥物 - Opioids

## ■ 使用鴉片類止痛藥之注意事項

隨時注意病患之生命徵象與意識狀況

給予氧氣與血氧濃度監測 (pulse oximeter)

肝腎功能障礙之患者須減量

Morphine 6-glucuronide (M-6-G) 亦有活性

Normeperidine – 可能 seizure attack

Meperidine – tachycardia



# Fentanyl – Durogesic<sup>®</sup> patch : 用於慢性疼痛或癌末患者



# PCNA (nasal)


## Butorphanol

噴鼻新劑型  
改變傳統止痛治療方式

唯一噴鼻強效止痛劑，止痛更方便  
“美時”

**Butaro<sup>®</sup> Nasal Spray**

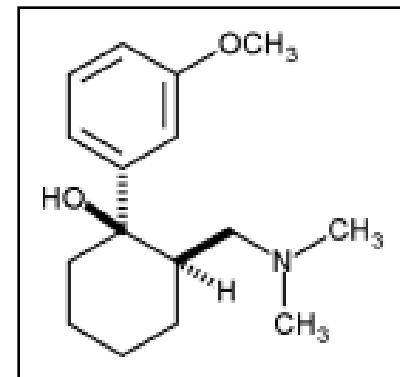
全安<sup>®</sup> 噴鼻液 2.5ml/瓶：0.1ml/噴  
(Butorphanol tartrate 10mg/ml)



- 使用簡單
- 止痛效果快
- 止痛效果強

# 疼痛治療藥物 - Tramadol

- 作用機轉複雜(類似鴉片類止痛藥與局部麻醉藥?)
- 靜注或口服劑型
- Muaction SR<sup>®</sup> 100 mg
- Ultracet<sup>®</sup> (37.5 mg Tramadol + 325 mg Acetaminophen)  
用於治療下背痛或骨骼肌肉痛
- 可用於急性疼痛(手術後)或慢性疼痛(神經病變性疼痛)
- 副作用：頭暈、噁心、嘔吐



# 疼痛治療藥物 - Antidepressants

- TCAs (三環抗憂鬱劑)
  - Amitriptyline (Tryptanol<sup>®</sup>)
  - Imipramine (Tofranil<sup>®</sup>)
  - Clomipramine (Anafranil<sup>®</sup>)
- 抑制 norepinephrine 與 serotonin 再吸收, 也有部分阻斷鈉離子通道
- 副作用
  - Sedation (嗜睡)
  - Confusion (意識模糊)
  - Blurred vision (視力模糊)
  - Postural hypotension (姿態性低血壓)
  - Arrhythmias (心律不整)
  - Suicidal tendency (自殺傾向)



# 疼痛治療藥物 - Antidepressants

- Venlafaxine (Effexor<sup>®</sup>) for polyneuropathy  
Serotonine / norepinephrine uptake inhibitor
- Douloxetine (Cymbalta<sup>®</sup>) for painful diabetic neuropathy  
SNRI / SSRI (selective norepinephrine / serotonine reuptake inhibitor)
- Bupropion (Wellbutrin<sup>®</sup> or Zyban<sup>®</sup>) for peripheral neuropathic pain  
Norepinephrine /dopamine reuptake inhibitor





# 疼痛治療藥物 - Anticonvulsants

- AEDs (antiepileptic drugs) 抗痙攣藥物 (阻斷鈉離子通道)  
Carbamazepine (Tegretol<sup>®</sup>), Phenytoin (Dilantin<sup>®</sup>)  
Painful diabetic neuropathy / Trigeminal neuralgia (三叉神經痛)  
**Steven-Johnson syndrome, bone marrow suppression**
- Gabapentin (Neurontin<sup>®</sup>), Pregabalin (Lyrica<sup>®</sup>) (阻斷鈣離子通道)  
Painful diabetic neuropathy / Postherpetic neuralgia (帶狀疱疹後神經痛)  
需自費
- 副作用  
**Sedation (嗜睡)**  
**Dizziness (頭暈)**



**Table III.** Clinical pharmacology of drugs commonly used in the treatment of pain

Drug class <sup>a</sup>	Indications	Route of administration	Adverse effects	Contraindications
Opioids	Treatment of pain such as acute, postoperative, neuropathic, inflammatory, cancer	Oral, intravenous, transdermal (patch), sublingual spray, intranasal spray, oral transmucosal, pulmonary, microspheres	Respiratory depression, sedation, nausea and vomiting, constipation, cognitive dysfunction, pruritus, tolerance/dependence, euphoria	Screen patients for alcohol/substance abuse; coadminister pre-emptive stool softeners and antiemetics
NSAIDs (traditional)	Prescribed as analgesics and anti-inflammatory agents	Oral, intravenous, intramuscular, topical	Gastrointestinal disturbances, renal, skin reactions	Patients with gastrointestinal and renal complications
Coxibs <sup>b</sup>	Relief of osteoarthritis, rheumatoid arthritis, acute and postoperative pain	Oral, intravenous	Cardiac (myocardial infarction and stroke), gastrointestinal problems with long-term use, renal (acute renal failure)	Patients with cardiovascular and cerebrovascular disease; care in patients with hypertension, hyperlipidaemia, diabetes mellitus, arterial disease or smoking
Antidepressants	Neuropathic pain	Oral	Sedation, constipation, dry mouth, orthostatic hypotension and weight gain using tricyclic antidepressants; ataxia, nausea and anorexia using newer antidepressants	Patients with glaucoma and/or taking monoamine oxidase inhibitors; duloxetine has been approved by US FDA for use in diabetic neuropathy.
Antiepileptic drugs	Painful diabetic neuropathy, post-herpetic neuralgia and trigeminal neuralgia	Oral	Sedation, ataxia, oedema, weight gain, diplopia	Patients with renal dysfunction need a dose adjustment
Cannabinoids	Chronic pain	Oral, sublingual spray, inhalation	Euphoria, memory impairment, tachycardia, tolerance	Patients with hypertension and ischaemic heart disease
Local anaesthetics	Blocking evoked pain	Local/regional, transdermal (patch), intravenous, neuroaxial (spinal, epidural)	Skin erythema, rash, convulsions, coma, cardiorespiratory depression with increasing doses	Those associated with loco-regional anaesthesia: non-consenting patient, local infection, coagulation disorders, inadequate monitoring

a See table I for lists of drugs within each class that are commonly used.

b Selective cyclo-oxygenase type 2 inhibitors.



# 大綱

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# 注射治療



## 觸痛點注射法

Trigger point injection

局部麻醉藥

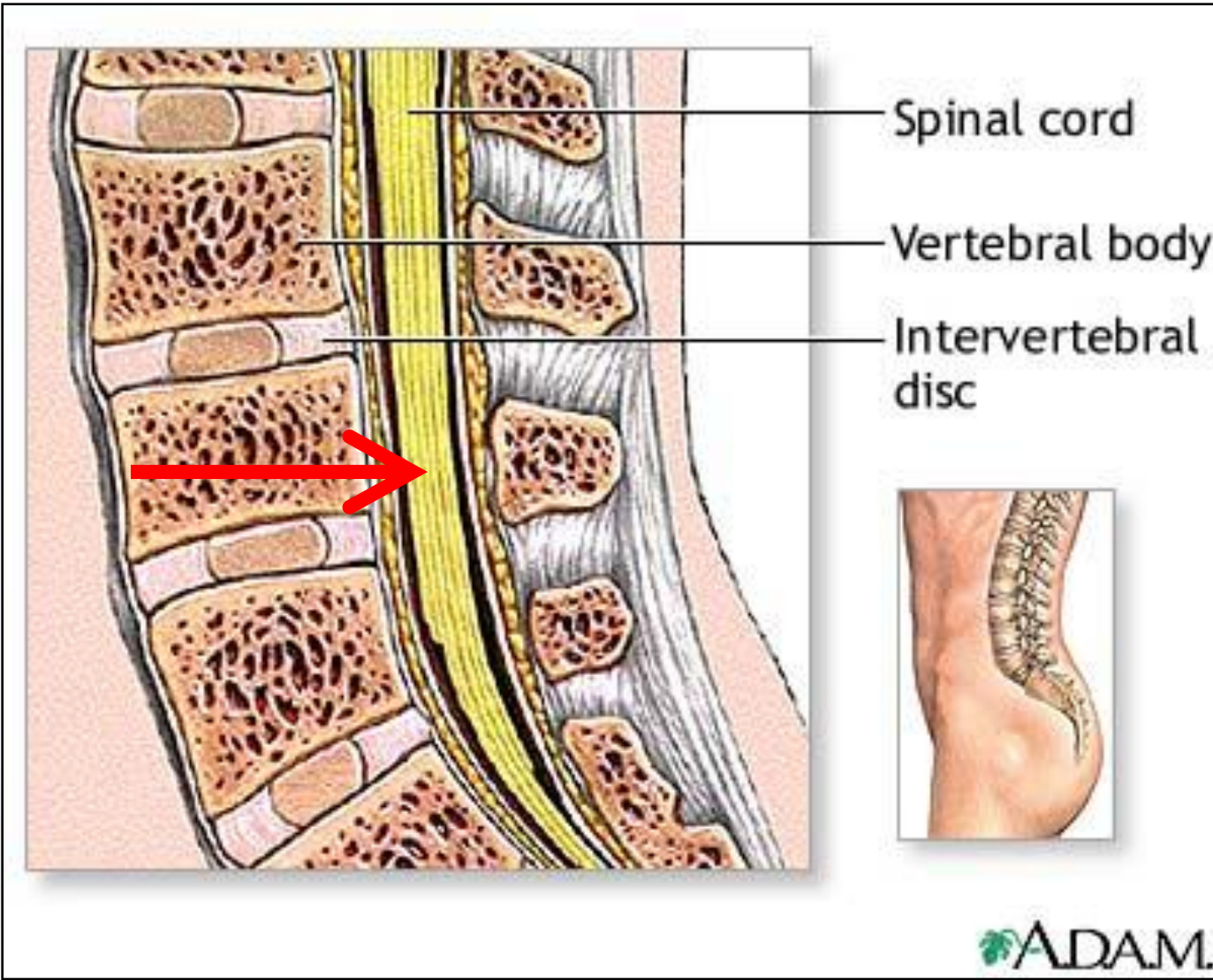
(Lidocaine, Ropivacaine)

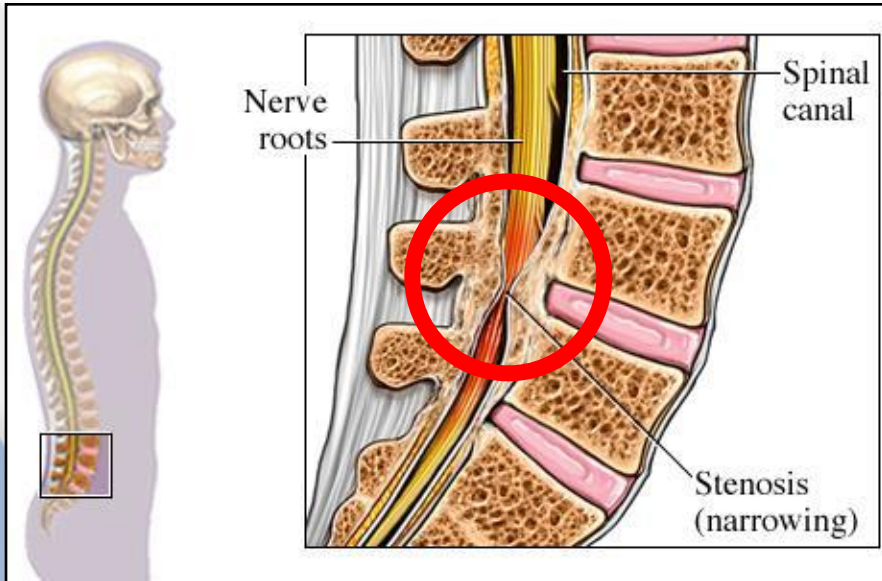


## 硬脊膜腔外注射法

Epidural injection







## 椎管狹窄 (Spinal stenosis)

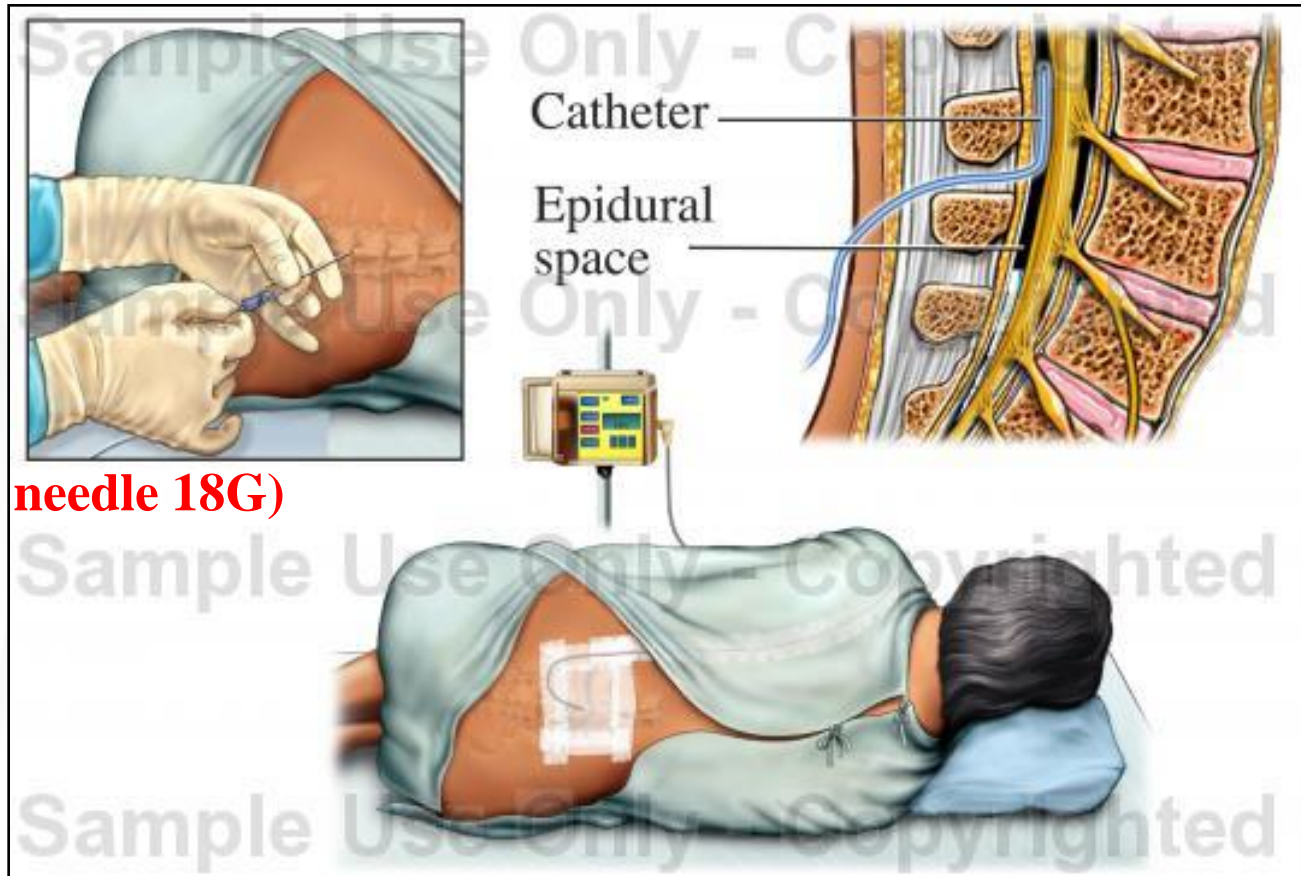




(正常)



# 硬脊膜腔外注射 (Epidural)

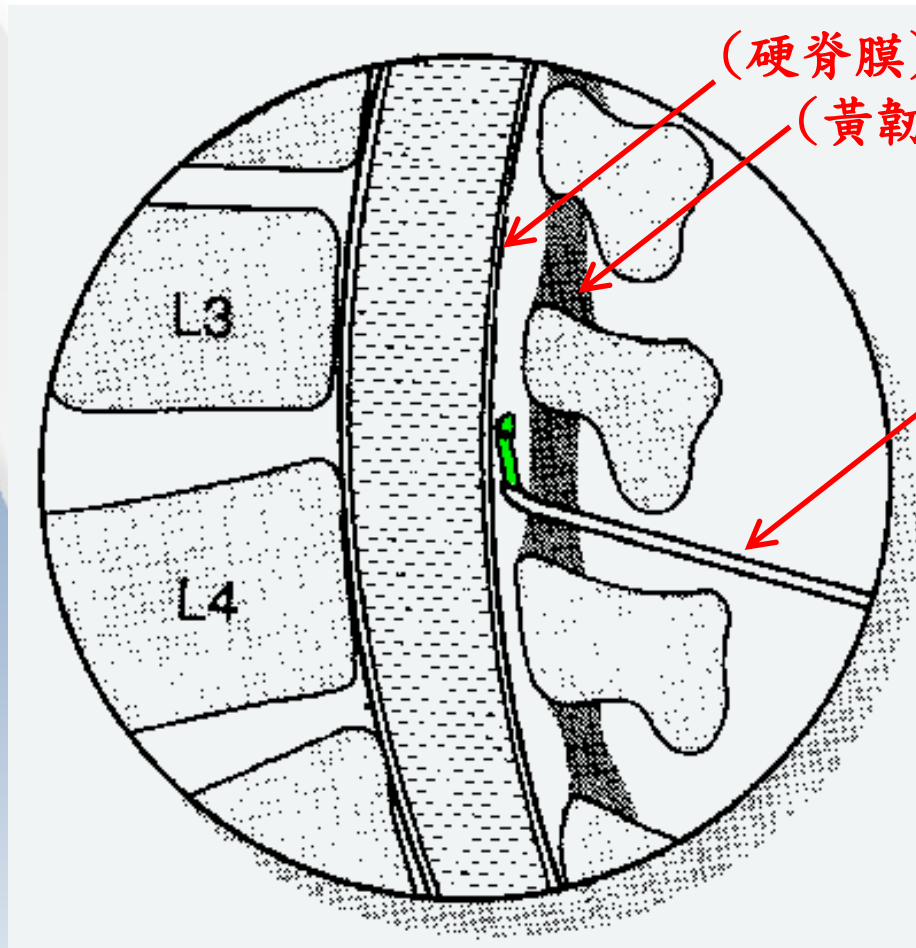


(Epidural needle 18G)





# 硬脊膜腔外注射 (Epidural)



(硬脊膜)

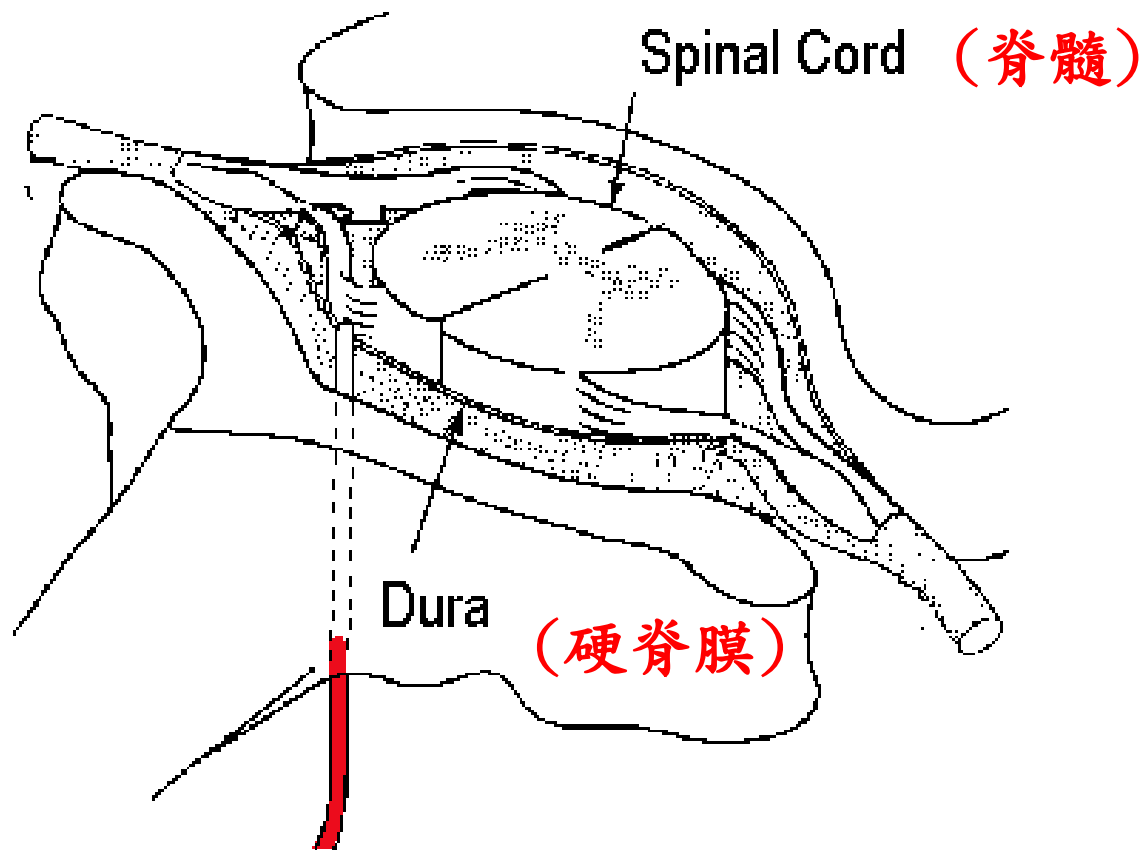
(黃韌帶)

(Epidural needle 18G)

低濃度局部麻醉藥  
(Lidocaine, Ropivacaine)

類固醇 (Shincort)

# 注射部位：頸椎 / 胸椎 / 腰椎



凝血功能異常之病患為禁忌

# 神經阻斷 (Nerve block)



# 感恩聆聽



# Reye's syndrome

- **Stage I**
  - Persistent, heavy vomiting that is not relieved by eating
  - Generalized lethargy
  - General mental symptoms, e.g. confusion
  - Nightmares
- **Stage II**
  - Stupor caused by minor brain inflammation
  - Hyperventilation
  - Fatty liver (found by biopsy)
  - Hyperactive reflexes
- **Stage III**
  - Continuation of Stage I and II symptoms
  - Possible coma
  - Possible cerebral edema
  - Rarely, respiratory arrest
- **Stage IV**
  - Deepening coma
  - Large pupils with minimal response to light
  - Minimal but still present hepatic dysfunction
- **Stage V**
  - Very rapid onset following stage IV
  - Deep coma
  - Seizures
  - Respiratory failure
  - Flaccidity
  - Extremely high blood ammonia (above 300mg per 100mL of blood)
  - Death

