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ESRA MEETING ANNUAL UPDATE

1 day, 1 programme, 3 cities

ROMA, 13 APRILE 2024

Responsabili scientifici:

Mario Bosco

Fabio Costa

Fabrizio Fattorini

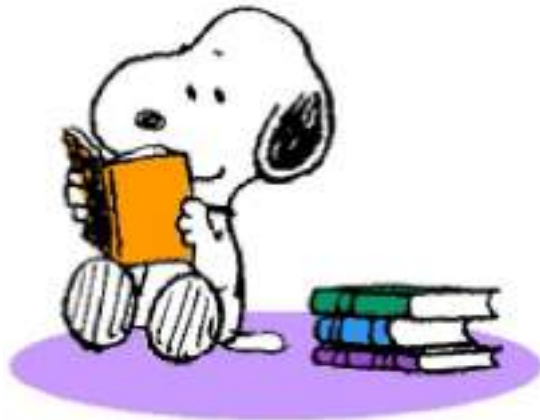


SESSIONE 3 - IL GINOCCHIO: PRIMA, DURANTE E DOPO

Moderatori: *L. Bertini, P. Volturo*

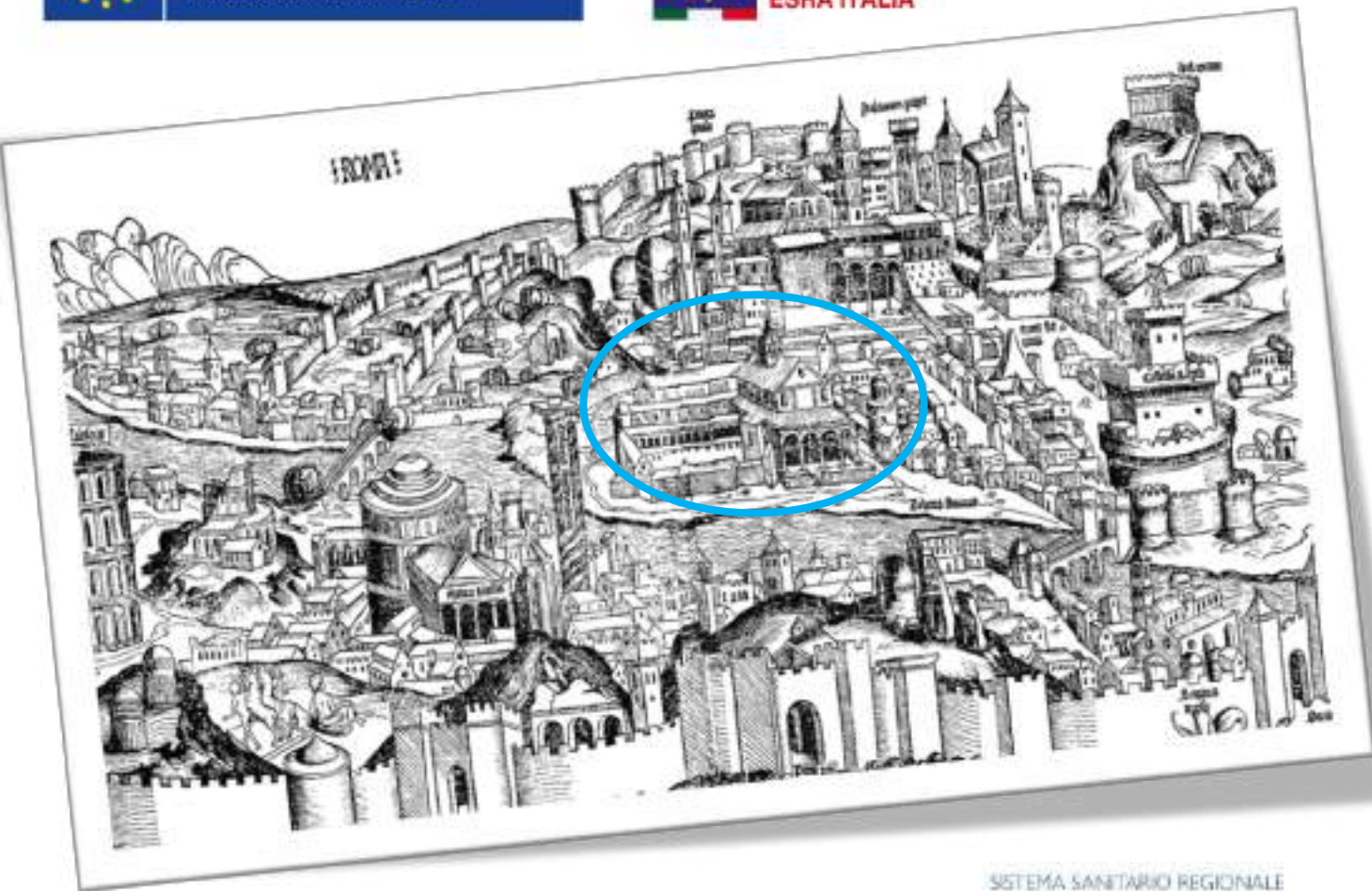
- 12.00 - 12.20 Tecniche anestesiolgiche. *R. Perna*
- 12.20 - 12.40 **Il dolore cronico post-chirurgia: come prevenirlo? *A. Clemente***
- 12.40 - 13.00 Il dolore cronico post-chirurgia: come gestirlo? Live demo. *B. Violo*
- 13.00 - 13.30 Discussione

CURIOSITÀ PER
APPROFONDIRE



DESIDERIO
DI METTERE
IN PRATICA





ANTONIO CLEMENTE

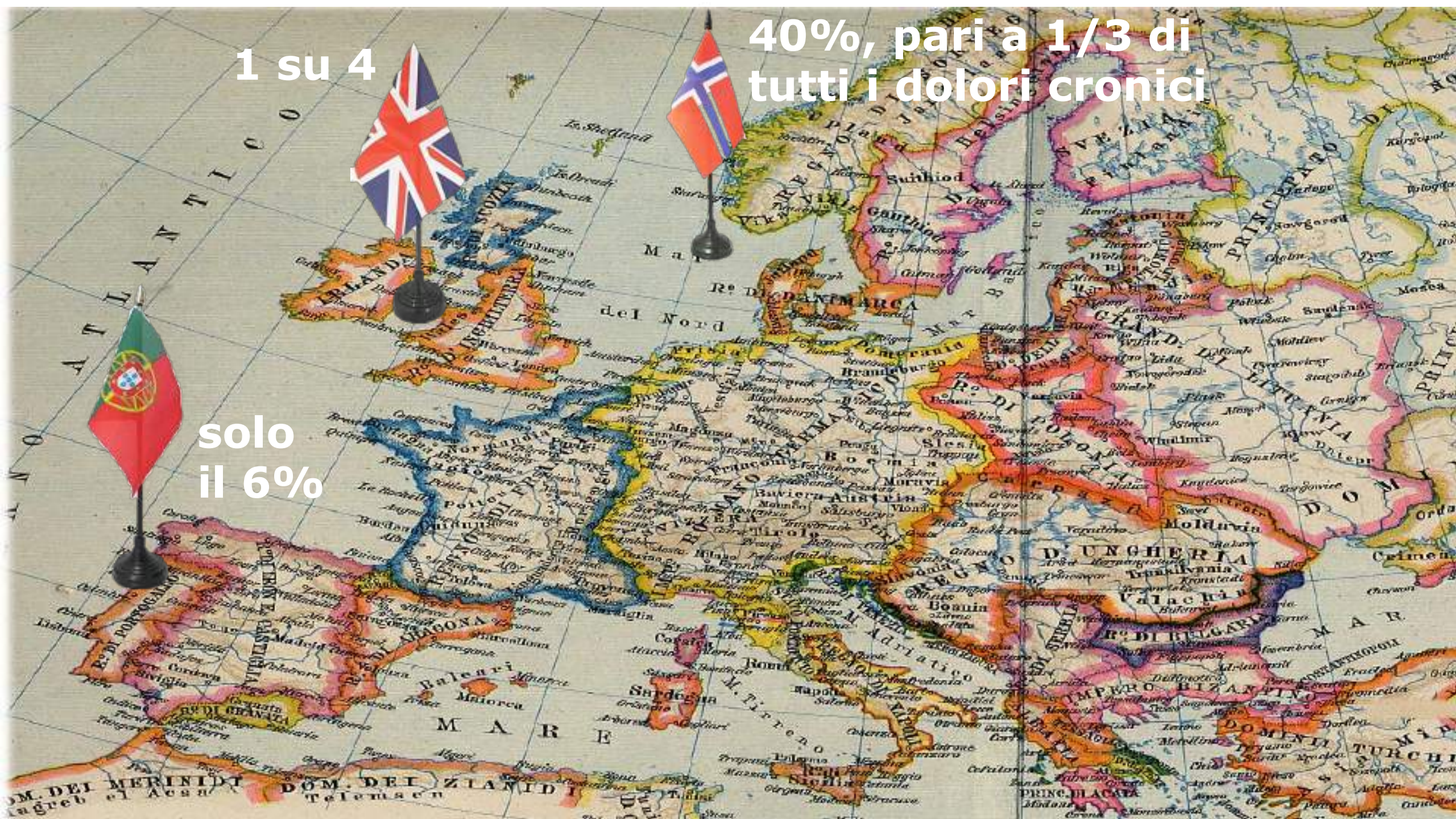
Responsabile Servizio di Accessi Vascolari
e Terapia del Dolore
Santo Spirito in Sassia
ASL Roma 1



1 su 4

40%, pari a 1/3 di
tutti i dolori cronici

solo
il 6%





Ti trovi in : [Home](#) - [Servizi Online](#) - [Ricetta Dematerializzata](#) - [Tipologia Medico](#) - [Compila ricetta elettronica](#)

Tipologia prescrizione (S,H)

Sugg

Ricov

Pulisci

Altro

Priorità prescrizione (U,B,D,P)

U

B

D

P

Pulisci

Codice diagnosi

SELEZIONARE UN ELEMENTO



SELEZIONARE UN ELEMENTO

ALTRO DOLORE CRONICO

ALTRO DOLORE CRONICO POST-OPERATORIO

DOLORE CRONICO DA TRAUMA

DOLORE CRONICO POST-TORACOTOMIA

Dolore cronico

SINDROME DA DOLORE CRONICO

Note diagnosi

Data compilazione

14/11/2021

CONFERMA

≥ 3 m

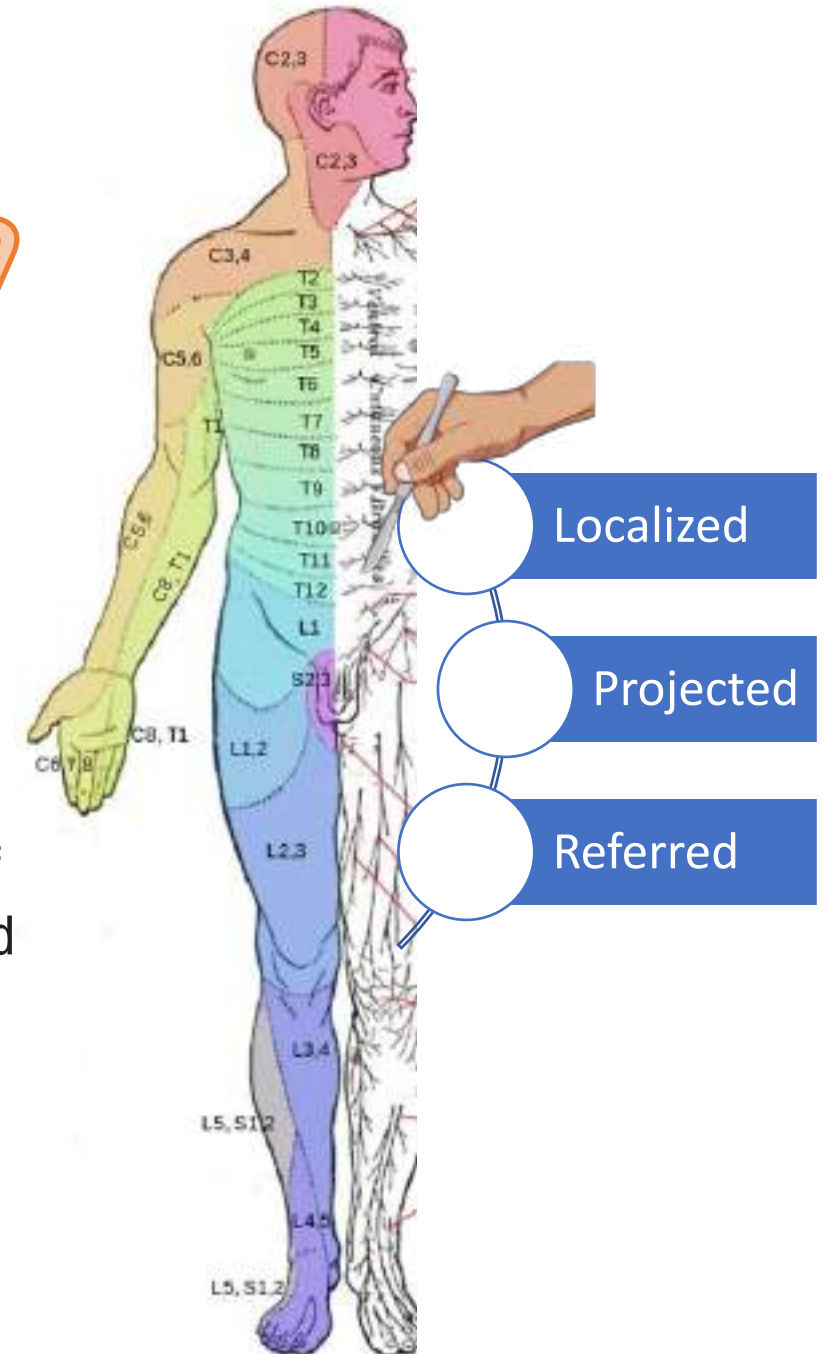
Pain that develops or increases in intensity after a surgical procedure and persists beyond the healing process (3 months or greater).

1. This pain should

- Localize to the surgical field, or
- Project to the innervation territory of a nerve situated in this area, or
- Refer in a known pattern from this area

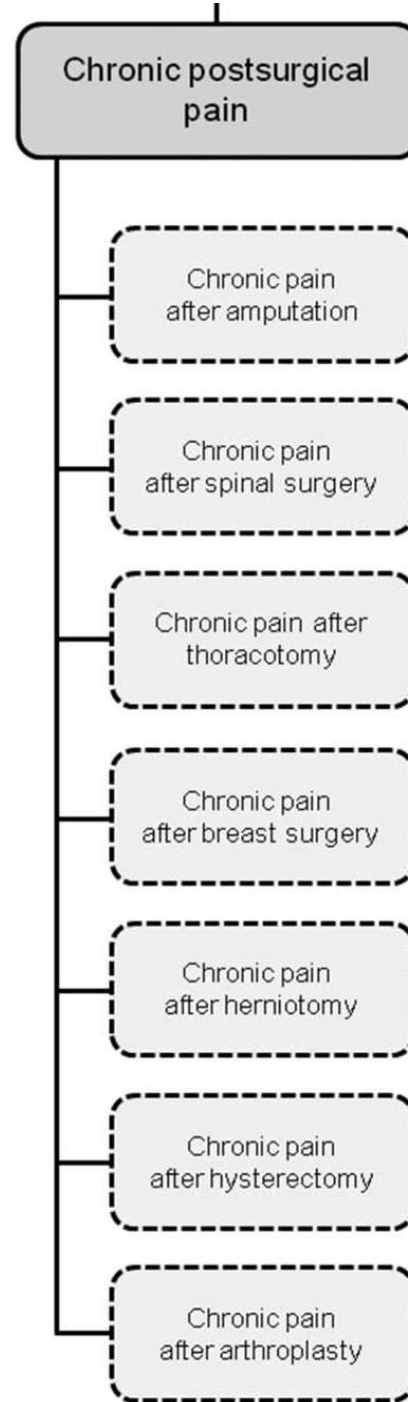
2. Preexisting pain conditions should be excluded

3. Other primary causes of pain such as infections, malignancy, nonunion of bone, loosening of surgical hardware, and other causes must be excluded



The IASP classification of chronic pain for ICD-11: chronic postsurgical or posttraumatic pain

Stephan A. Schug^a, Patricia Lavand'homme^b, Antonia Barke^c, Beatrice Korwisi^c, Winfried Rief^c, Rolf-Detlef Treede^{d,*}, The IASP Taskforce for the Classification of Chronic Pain

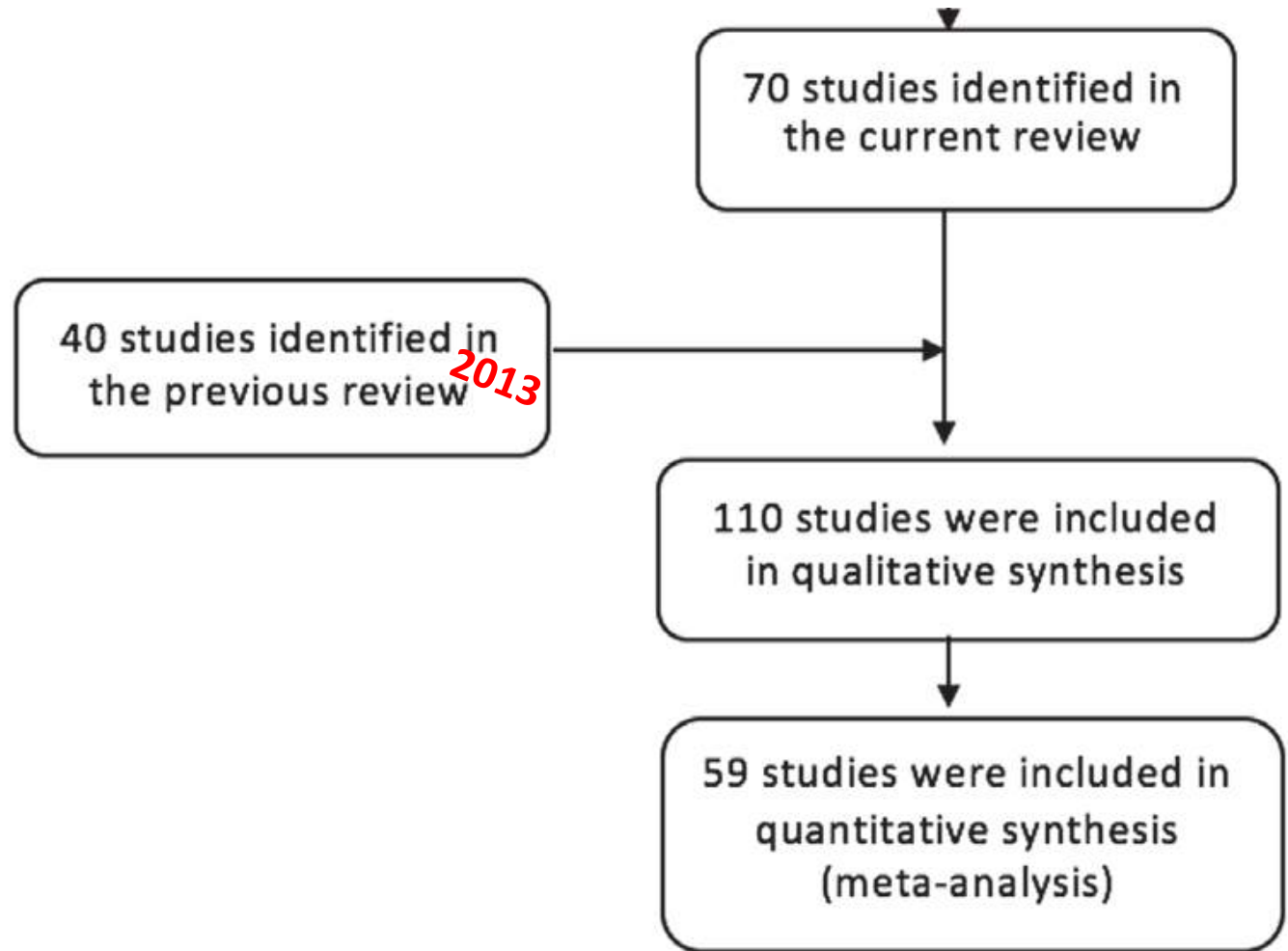
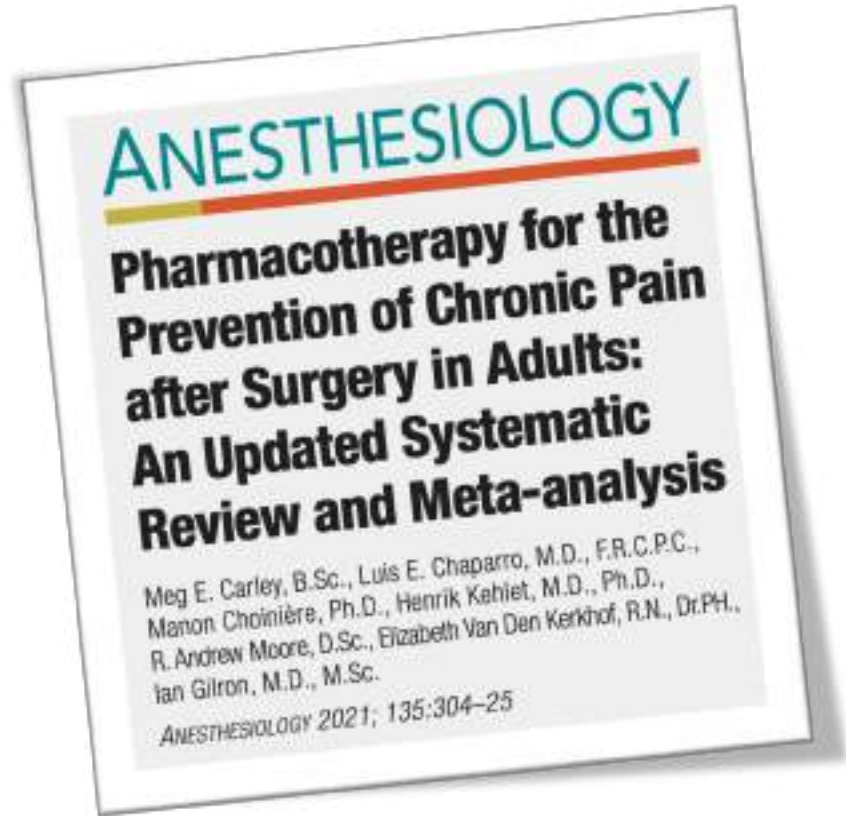


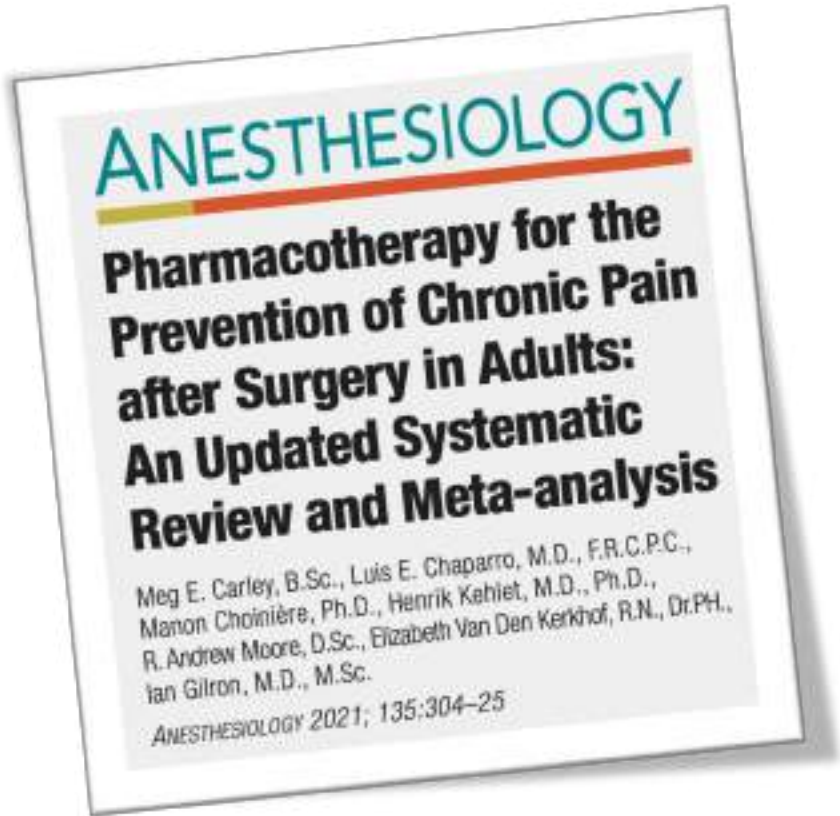
Chronic pain
 after arthroplasty

	Incidence of all CPSP	Incidence of severe CPSP (>5/10 of 10/10)
Hip arthroplasty	27%	6%
Knee arthroplasty	13%-44%	15%

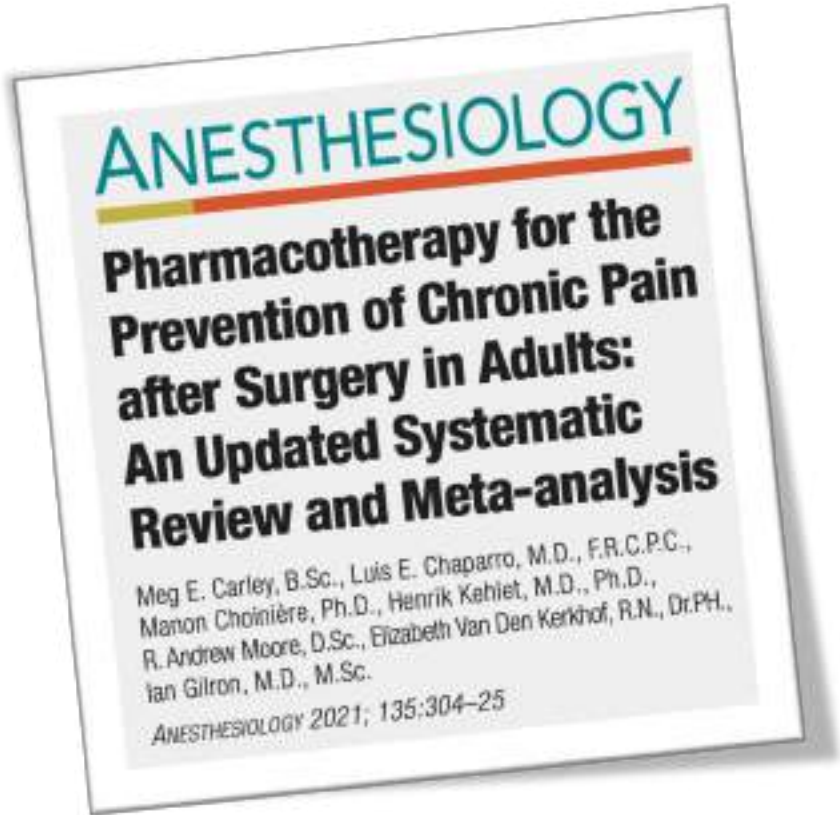
47% after revision surgery



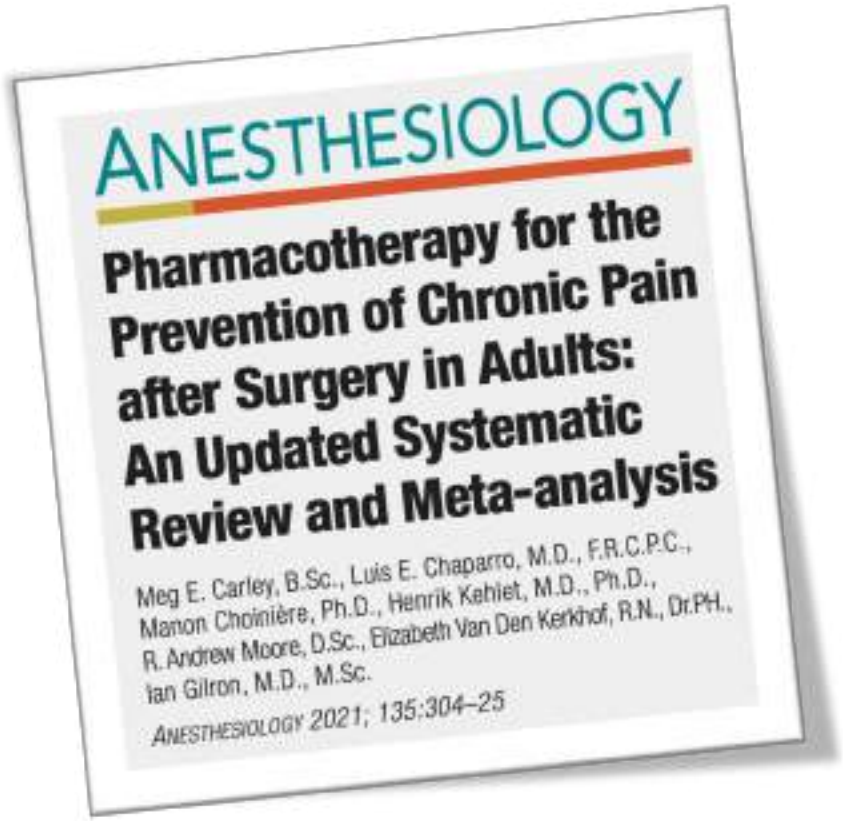




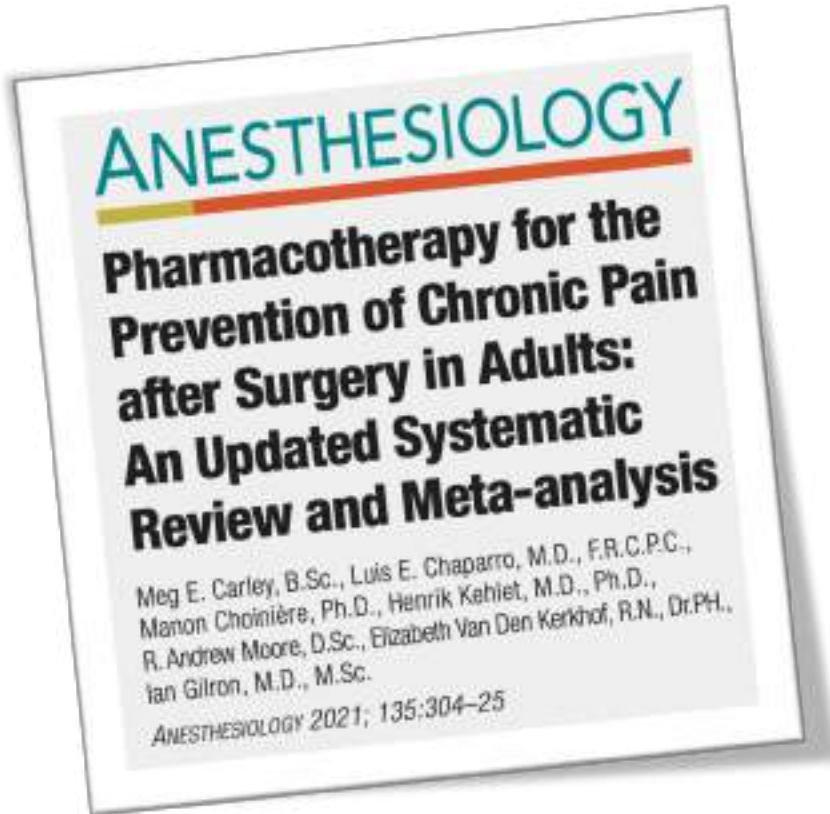
Drug	Surgery	No. of Patients	Allowed Patients with Pain	Follow-up, mo	Preoperative Dose	Intraoperative Dose	Postoperative Dose	Cumulative Dose*
Ketamine	Total knee arthroplasty	75	Yes	12	200 µg/kg	120 µg · kg ⁻¹ · h ⁻¹	60 µg/kg for 48 h	3,305 µg/kg†
Ketamine	Cesarean	140	No	12	250 µg/kg	None	None	250 µg/kg
					500 µg/kg	None	None	500 µg/kg
					1,000 µg/kg	None	None	1,000 µg/kg
Ketamine	Breast augmentation	106	No	12	420 µg/kg	200 µg · kg ⁻¹ · h ⁻¹	None	820 µg/kg†
Ketamine	Thoracotomy	77	No	12	100 µg/kg	100 µg/kg for 96 h		9,700 µg/kg
Ketamine	Breast	36	Long-term analgesic or anti-inflammatory treatment excluded	3	500 µg/kg	250 µg · kg ⁻¹ · h ⁻¹	None	908 µg/kg†
Ketamine	Major lower back	160	Yes	12	250 µg/kg	250 µg/kg for ~1 h; down to 100 µg/kg until end of postanesthesia care unit stay		900 µg/kg†
Ketamine	Rectal cancer	100	Unclear	12	250 µg/kg	125 µg · kg ⁻¹ · h ⁻¹	None	772 µg/kg†
					500 µg/kg	250 µg · kg ⁻¹ · h ⁻¹	None	1,595 µg/kg†
Ketamine	Thoracotomy	86	No	4	1,000 µg/kg	1,000 µg · kg ⁻¹ · h ⁻¹	1,000 µg/kg for 24h	3,000 µg/kg†
Ketamine	Orthopedic	120	Taking psychoactive drugs or opiates excluded	3	150 µg/kg	None	None	150 µg/kg
					500 µg/kg	None	None	500 µg/kg
Ketamine	Amputation	45	Yes	6	500 µg/kg	150 µg/kg for 72 h		11,300 µg/kg
Ketamine	Thoracotomy	81	Taking neuropathic pain drugs, antidepressants, anticonvulsants, NSAIDs, or opioids excluded	6	1,000 µg/kg	120 µg/kg for 72 h		9,640 µg/kg
Ketamine	Nephrectomy	63	No	3	150 µg/kg	100 µg · kg ⁻¹ · h ⁻¹	100 µg/kg for 24 h	22,350 µg/kg†
Ketamine	Thoracotomy	60	No	3	500 µg/kg	180 µg · kg ⁻¹ · h ⁻¹	90 µg/kg for 48 h	5,356 µg/kg†
Ketamine	Radical prostatectomy	160	Chronic opioid use excluded	6	200 µg/kg	175 µg/kg in 70 min	None	375 µg/kg
					None	200 + 175 µg/kg in 70 min	None	375 µg/kg
Ketamine	Thyroidectomy	64	No	3	150 µg/kg	120 µg · kg ⁻¹ · h ⁻¹	None	472 µg/kg†
Ketamine	Breast	100	Unclear	6	None	1,000/day for 48 h		2,000 µg/kg
Ketamine	Total hip arthroplasty	142	Taking corticosteroids or opioids excluded	3	500 µg/kg	3 µg · kg ⁻¹ · h ⁻¹	None	506 µg/kg†
Ketamine	Thoracotomy	66	Unclear	6	None	100 µg/kg for 60 h		6,000 µg/kg
Ketamine	Lumbar fusion	150	Yes	6	500 µg/kg	250 µg · kg ⁻¹ · h ⁻¹	None	1,042 µg/kg†
Ketamine	Total knee arthroplasty	16	Taking >10 mg morphine equivalent excluded	6	500 µg/kg	240 µg · kg ⁻¹ · h ⁻¹	None	1,002 µg/kg†
Ketamine	Abdominal, thoracic, breast, or inguinal herniorrhaphy	80	No	6	500 µg/kg	250 µg · kg ⁻¹ · h ⁻¹	100 µg/kg for 24h	3,558 µg/kg†
Ketamine	Total hip arthroplasty	160	Taking neuropathic pain drugs or >10 mg morphine equivalent excluded	6	500 µg/kg	120 µg/kg for 24 h		3,380 µg/kg†
Ketamine	Hysterectomy	60	No	6	300 µg/kg	50 µg · kg ⁻¹ · h ⁻¹	None	363 µg/kg†
Ketamine	Hemorrhoidectomy	83	Regular use of opioids excluded	3	350 µg/kg	300 µg · kg ⁻¹ · h ⁻¹	None	452 µg/kg†



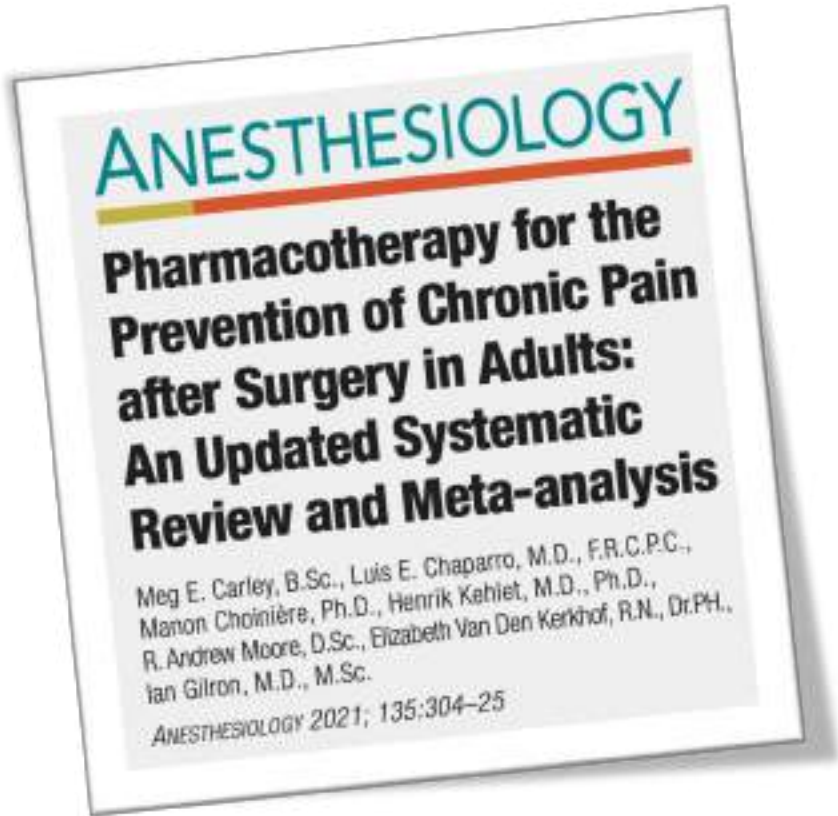
Drug	Surgery	No. of Patients	Allowed Patients with Pain	Follow-up, mo	Preoperative Dose	Intraoperative Dose	Postoperative Dose	Cumulative Dose*
Ketamine	Thoracotomy	50	Unclear	6	None	50 µg/kg for 72 h		3,600 µg/kg†
Ketamine	Orthopedic	352	Taking opioids daily for >1 week excluded	6	None	None	1.5 mg‡	1,198 µg/kg§
Ketamine	Thoracotomy	125	No	6	500 µg/kg	None	250 µg/kg for 48 h	12,500 µg/kg
Pregabalin	Cardiac	150	No	6	150 mg	None	150 mg for 14 days	2,250 mg
Pregabalin	Cardiac	101	No	3	75 mg	None	None	75 mg
					150 mg	None	None	150 mg
Pregabalin	Thoracotomy	114	No	3	300 mg	None	300 mg for 4 days	1,500 mg
Pregabalin	Spine	40	Yes	3	300 mg	None	300 mg for 1 day	600 mg
Pregabalin	Total knee arthroplasty	240	Yes	6	300 mg	None	300 mg for 10 days, 150 mg for 2 days, 100 mg for 2 days	3,800 mg
Pregabalin	Spine	120	Yes	6	150 mg	None	300 mg for 3.5 days	1,200 mg
Pregabalin	Total hip arthroplasty	184	Taking chronic pain medications, >10 mg morphine equivalent, or anticonvulsants excluded	3	150 mg	None	150 mg for 9 days	1,500 mg
Pregabalin	Hysterectomy/ myomectomy	80	No	3	450 mg	None	450 mg for 5 days	2,700 mg
Pregabalin	Spine	60	Taking opioids, sedatives, or anticonvulsants excluded	12	300 mg	None	300 mg for 2 days	900 mg
Pregabalin	Cardiac	40	Taking anticonvulsants or antidepressants, or chronic analgesic use excluded	3	150 mg	None	150 mg for 2 days	450 mg
Pregabalin	Breast	100	No	3	300 mg	None	150 mg for 9 days	1,650 mg
Pregabalin	Spine	90	Yes	3	75 mg	None	225 mg for 7 days	1,650 mg
Pregabalin	Thyroidectomy	99	Taking pregabalin, gabapentin, or opioids excluded	3	150 mg	None	150 mg for 1 day	300 mg
Pregabalin	Thoracotomy	100	No	9	300 mg	None	300 mg for 5 days	1,800 mg
Pregabalin	Total hip arthroplasty	142	Taking corticosteroids or opioids excluded	3	150 mg	None	None	150 mg
Pregabalin	Nephrectomy	80	Taking analgesics or sedatives excluded	12	150 mg	None	450 mg for 1 day	600 mg
Pregabalin	Cardiac	70	No	3	150 mg	None	150 mg for 5 days	900 mg
Pregabalin	Breast	200	No	6	75 mg	None	150 mg for 7 days	1,125 mg
Pregabalin	Brain tumor	100	Yes	3	300 mg	None	300 mg for 3 days	1,200 mg
Pregabalin	Thoracotomy	45	No	3	150 mg	None	150 mg for 5 days	900 mg
Pregabalin	Hysterectomy	501	Unclear	6	150 mg	None	150 mg for 28 days	4,350 mg
					300 mg	None	300 mg for 28 days	8,550 mg
Pregabalin	Inguinal hernia repair	425	Unclear	6	50 mg	None	50 mg for 7 days	400 mg
					150 mg	None	150 mg for 7 days	1,200 mg
					300 mg	None	300 mg for 7 days	2,400 mg



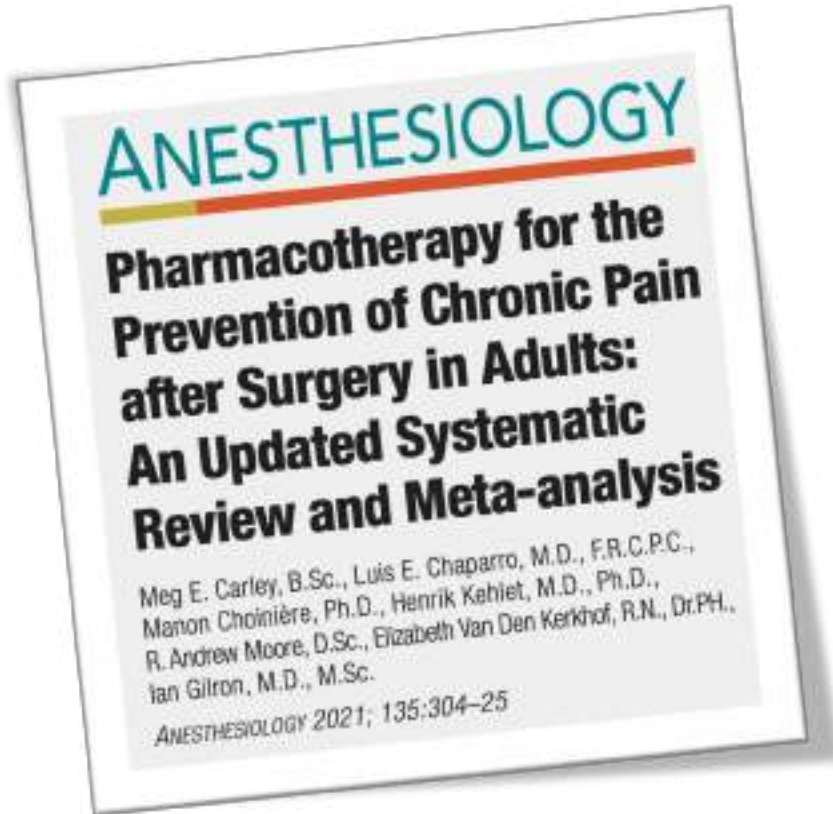
Drug	Surgery	No. of Patients	Allowed Patients with Pain	Follow-up, mo	Preoperative Dose	Intraoperative Dose	Postoperative Dose	Cumulative Dose*
Pregabalin	Total knee arthroplasty	307	Unclear	6	150 mg 300 mg	None None	150 mg for 42 days 300 mg for 42 days	6,450 mg 12,900 mg
Pregabalin	Breast	80	Patients with chronic pain on analgesics or past/current use of gabapentinoids excluded	3	150 mg	None	150 mg for 7 days	1,200 mg
Pregabalin	Total knee arthroplasty	120	Chronic use of gabapentin, pregabalin, or opioids excluded	3	100 mg 200 mg 300 mg	None None None	100 mg for 14 days, 50 mg for 2 days 200 mg for 14 days, 100 mg for 2 days 300 mg for 14 days, 150 mg for 2 days	1,600 mg 3,200 mg 4,800 mg
Pregabalin	Spine	105	Use of opioids, pregabalin, or gabapentin within past 2 weeks excluded	12	300 mg 300 mg	None None	300 mg for 1 days 300 mg for 14 days	600 mg 4,500 mg
Gabapentin	Breast	150	Taking antidepressants, anticonvulsants, NSAIDs, or opioids excluded	6	300 mg	None	300 mg for 9 days	3,000 mg
Gabapentin	Thyroidectomy	50	No	6	1,200 mg	None	None	1,200 mg
Gabapentin	Total hip arthroplasty	126	Taking chronic pain medications excluded	6	600 mg None	None None	None 600 mg	600 mg 600 mg
Gabapentin	Total knee arthroplasty	179	Taking chronic pain medications excluded	3	600 mg	None	600 mg for 4 days	3,000 mg
Gabapentin	Breast	75	Taking analgesics, sedatives, hypnotics, or antidepressants excluded	3	1,200 mg	None	1,200 mg for 9 days	12,000 mg
Gabapentin	Thoracotomy	104	No	6	1,200 mg	None	600 mg for 1 day, 900 mg for 1 day, 12,000 mg for 3 days	6,300 mg
Gabapentin	Thoracotomy, total hip arthroplasty, total knee arthroplasty, or breast	422	Yes	24	1,200 mg	None	1,800 mg for 3 days	6,600 mg
Gabapentin	Spine	90	Yes	3	300 mg	None	900 mg for 7 days	6,600 mg
Gabapentin	Thoracotomy	146	No	3	600 mg	None	None	600 mg
Gabapentin	Total knee arthroplasty	300	Taking gabapentinoids, antiepileptics, anxiolytics, antidepressants, systemic glucocorticoids, or opioids excluded	3–4 yr	900 mg 600 mg	None None	400 mg for 1 day, 1300 mg for 6 days 300 mg for 1 day, 900 mg for 6 days	9,100 mg 6,300 mg
Gabapentin	Caesarean	46	Taking analgesics in previous week excluded	3	600 mg	None	None	600 mg



Drug	Surgery	No. of Patients	Allowed Patients with Pain	Follow-up, mo	Preoperative Dose	Intraoperative Dose	Postoperative Dose	Cumulative Dose*
Gabapentin	Amputation	46	Yes	6	None	None	300 mg for 1 day, 900 mg for 3 days, 1,200 mg for 2 days, 1,500 mg for 2 days, 1,800 mg for 2 days, 2,100 mg for 2 days, 2,400 mg for 18 days	75,600 mg
Gabapentin	Inguinal hernia repair	100	Yes	24	300 mg	None	600 mg for 1 day, 900 mg for 1 day	1,800 mg
Gabapentin	Carpal tunnel	40	Yes	6	600 mg	None	None	600 mg
Gabapentin	Hysterectomy	60	No	6	1,200 mg	None	None	1,200 mg
Gabapentin	Inguinal herniorrhaphy	60	Unclear	6	1,200 mg	None	None	1,200 mg
Gabapentin	Cesarean	132	No	3	600 mg	None	None	600 mg
					300 mg	None	None	300 mg
Gabapentin	Cardiac	40	Taking analgesics excluded	6	1,200 mg	None	1,200 mg for 2 days	3,600 mg
IV lidocaine	Colectomy	95	No	6	60 mg	60 mg/h for 48 h		43.2 mg/kg†
IV lidocaine	Thyroidectomy	90	No	3	2 mg/kg	3 mg · kg ⁻¹ · h ⁻¹	None	9.4 mg/kg†
IV lidocaine	Breast	36	No	3	1.5 mg/kg	1.5 mg · kg ⁻¹ · h ⁻¹	1.5 mg/kg for 1 h	4.5 mg/kg†
IV lidocaine	Spine	44	Chronic opioid use excluded	3	2 mg/kg	3 mg · kg ⁻¹ · h ⁻¹	None	7.4 mg/kg†
IV lidocaine	Nephrectomy	63	No	3	1.5 mg/kg	1 mg · kg ⁻¹ · h ⁻¹	1 mg/kg for 24 h	27.8 mg/kg†
IV lidocaine	Breast	150	No	6	1.5 mg/kg	2 mg · kg ⁻¹ · h ⁻¹	None	8.1 mg/kg†
IV lidocaine	Breast	100	No	3	1.5 mg/kg	2 mg · kg ⁻¹ · h ⁻¹	None	5.1 mg/kg†
IV lidocaine	Breast	126	No	3	2 mg/kg	2 mg · kg ⁻¹ · h ⁻¹	None	6.3 mg/kg†
IV lidocaine	Total hip arthroplasty	60	Taking corticosteroids or opioids excluded	3	1.5 mg/kg	1.5 mg · kg ⁻¹ · h ⁻¹	1.5 mg/kg for 1h	6.8 mg/kg†
IV lidocaine	Breast	80	No	6	1.5 mg/kg	2 mg · kg ⁻¹ · h ⁻¹	2 mg/kg for 2 h	11.1 mg/kg†
Parecoxib	Thoracotomy	86	No	12	40 mg	None	80 mg for 2.5 days	240 mg
Parecoxib	Breast augmentation	219	Chronic analgesic use excluded	12	40 mg	None	None	40 mg
Ibuprofen	Total hip arthroplasty	902	Taking NSAIDs within 48 h excluded	6–12	None	None	1,200 mg for 14 days	16,800 mg
Ibuprofen	Breast	30	Chronic use of aspirin or NSAIDs excluded	6	400 mg	None	1,600 mg for 2 days	2,000 mg
Celecoxib	Total knee arthroplasty	107	Taking narcotics daily excluded	12	None	None	400 mg for 42 days	16,800 mg
Dexketoprofen	Thoracotomy	60	Unclear	6	50 mg	None	50 mg	100 mg
Flurbiprofen axetil	Breast	60	No	12	50 mg	None	50 mg	100 mg
Parecoxib	Breast	138	No	12	40 mg	None	40 mg	80 mg
Celecoxib					None	None	200 mg for 5 days	1,000 mg
Dexamethasone	Total hip arthroplasty	50	Yes	12	40 mg	None	None	40 mg



Drug	Surgery	No. of Patients	Allowed Patients with Pain	Follow-up, mo	Preoperative Dose	Intraoperative Dose	Postoperative Dose	Cumulative Dose*
Dexamethasone	Spine	160	Taking steroids or strong opioids excluded	12	16 mg	None	None	16 mg
Dexamethasone	Spine	112	Yes	24	0.2 mg/kg	None	4 doses of 0.06 mg/kg	0.44 mg/kg
Hydrocortisone	Cardiac	36	Unclear	6	100 mg	240 mg for 1 day, 120 mg for 1 day, 60 mg for 1 day, 30 mg for 1 day	550 mg	
Methylprednisolone	Breast augmentation	219	Chronic analgesic use excluded	12	125 mg	None	None	125 mg
Methylprednisolone	Cardiac	1,043	Yes	6	500 mg	None	None	500 mg
Acetaminophen	Hysterectomy	140	No	3	None	None	4,000 mg for 3 days	12,000 mg
Acetaminophen	Cardiac	150	No	3	None	None	4,000 mg for 1 day	4,000 mg
Amantadine	Breast	22	No	6	200 mg	None	200 mg for 13 days	2,800 mg
Amantadine	Mandibular fracture	60	Opioid use or dependency excluded	6	100 mg	None	None	100 mg
Dexmedetomidine	Hysterectomy	80	No	12	0.5 µg · kg ⁻¹ · h ⁻¹		N/A	0.70 µg/kg
Dextromethorphan	Hysterectomy	50	No	3	750 mg	None	None	750 mg
Duloxetine	Spine	101	Yes	3	30 mg for 5 days, 60 mg for 9 days	None	60 mg for 81 days	5,550 mg
Duloxetine	Total knee arthroplasty	106	Chronic use of gabapentin, pregabalin, or opioids excluded	3	60 mg	None	60 mg for 14 days	900 mg
Etanercept	Inguinal herniorrhaphy	77	Yes	12	50 mg	None	None	50 mg
Fentanyl	Amputation	65	Yes	6	58.3 µg/h	54.5 µg/h for 2 days	None	Variable
Magnesium	Breast	126	No	3	20 mg/kg + 20 mg · kg ⁻¹ · h ⁻¹		63.2 mg/kg	Intraoperative
Memantine	Amputation	19	Yes	12	None	None	10 mg for 7 days, 20 mg for 7 days, 30 mg for 14 days	630 mg
Mexiletine	Breast	100	Taking analgesics, sedatives, or antidepressants excluded	3	200 mg	None	400 mg for 6 days	2,600 mg
Mexiletine	Breast	75	Taking analgesics, sedatives, hypnotics, or antidepressants excluded	3	200 mg	None	600 mg for 10 days	6,200 mg
Minocycline	Carpal Tunnel	131	Yes	12	200 mg	None	200 mg for 5 days	1,200 mg
Minocycline	Spine	100	Yes	3	200 mg	None	200 mg for 8 days	1,800 mg
Nefopam	Total knee arthroplasty	75	Yes	12	0.2 mg/kg	120 µg · kg ⁻¹ · h ⁻¹	60 µg · kg ⁻¹ · h ⁻¹ for 2 days	3,128 µg/kg
Nefopam	Thyroidectomy	58	Chronic use of opioids or any analgesic drugs >2 weeks excluded	3	0.2 mg/kg + 120 µg · kg ⁻¹ · h ⁻¹		None	520 µg/kg
Nefopam	Breast	94	Taking any kind of analgesic excluded	3	20 mg	None	None	20 mg



Drug	Surgery	No. of Patients	Allowed Patients with Pain	Follow-up, mo	Preoperative Dose	Intraoperative Dose	Postoperative Dose	Cumulative Dose*
Nitrous oxide	Numerous	2,050	Unclear	54	Intraoperative 70%		None	Intraoperative
Nitrous oxide	Numerous	3,325	Yes	12	Intraoperative 70%		None	Intraoperative
Valproic acid	Amputation	128	Yes	3	250 mg	None	750 mg for 3.7 days	2,775 mg
Venlafaxine	Breast surgery	150	Taking antidepressants, anticonvulsants, NSAIDs, opioids excluded	6	37.5 mg	None	37.5 mg for 9 days	375 mg
Vitamin C	Spinal fusion	123	Yes	12	None	Not reported	Not reported for 45 days	Not reported

Conclusions

none of the drugs studied so far can be recommended for clinical use specifically for the indication of preventing chronic pain after surgery.

Non-opioid analgesics for the prevention of chronic postsurgical pain: a systematic review and network meta-analysis

Brett Doleman^{1,*}, Ole Mathiesen^{2,3}, Alex J. Sutton⁴, Nicola J. Cooper⁴, Jon N. Lund¹ and John P. Williams¹

British Journal of Anaesthesia, 130 (6): 719–728 (2023)

In conclusion, current evidence suggests a possible reduction in chronic postsurgical pain with lidocaine (most effective), gabapentinoids, ketamine, and possibly dexmedetomidine up to 6 months. There was insufficient evidence for longer-term outcomes, opioid use, or serious adverse events.

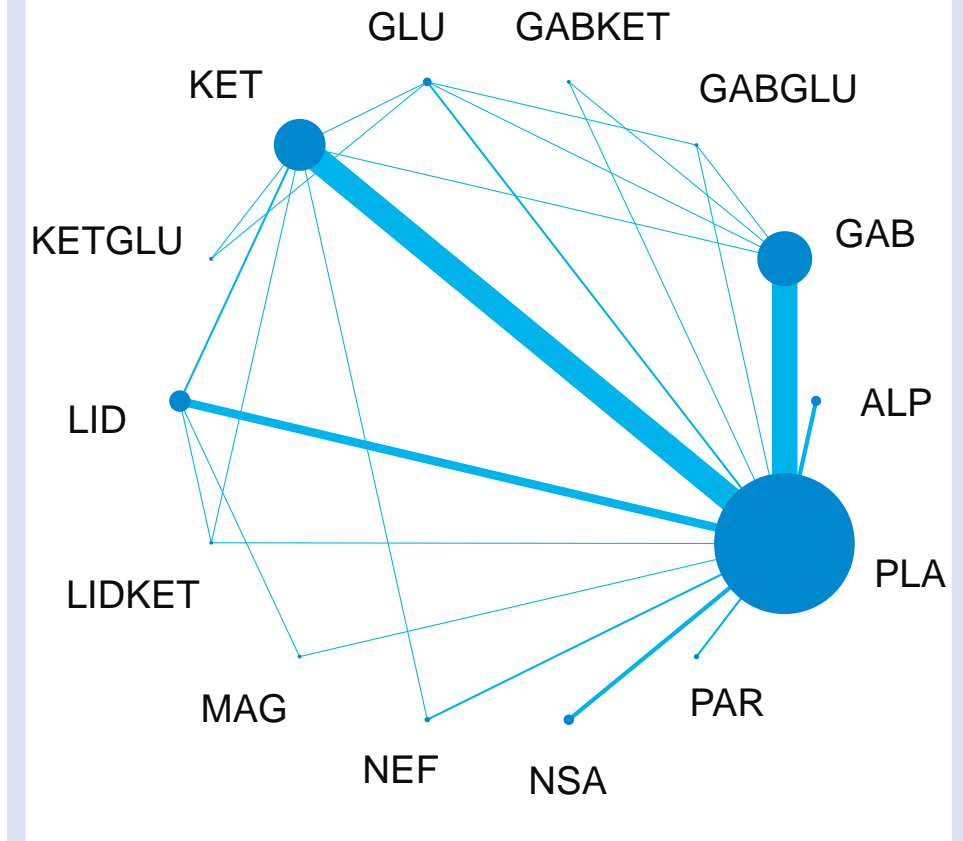


Fig 2. Network plot for the incidence of chronic postsurgical pain \leq 6 months. Node size (blue circle) is proportional to the number of trials evaluating that intervention and the blue lines the number of comparisons between each treatment. ALP, alpha-2 agonists; GAB, gabapentinoids; GABGLU, gabapentinoids and glucocorticoids; GABKET, gabapentinoids and ketamine; GLU, glucocorticoids; KET, ketamine; KETGLU, ketamine and glucocorticoids; LID, lidocaine; LIDKET, lidocaine and ketamine; MAG, magnesium; NEF, nefopam; NSA, NSAIDs and COX-2 inhibitors; PAR, paracetamol; PLA, placebo.

Review Article

The role of regional anaesthesia and multimodal analgesia in the prevention of chronic postoperative pain: a narrative review

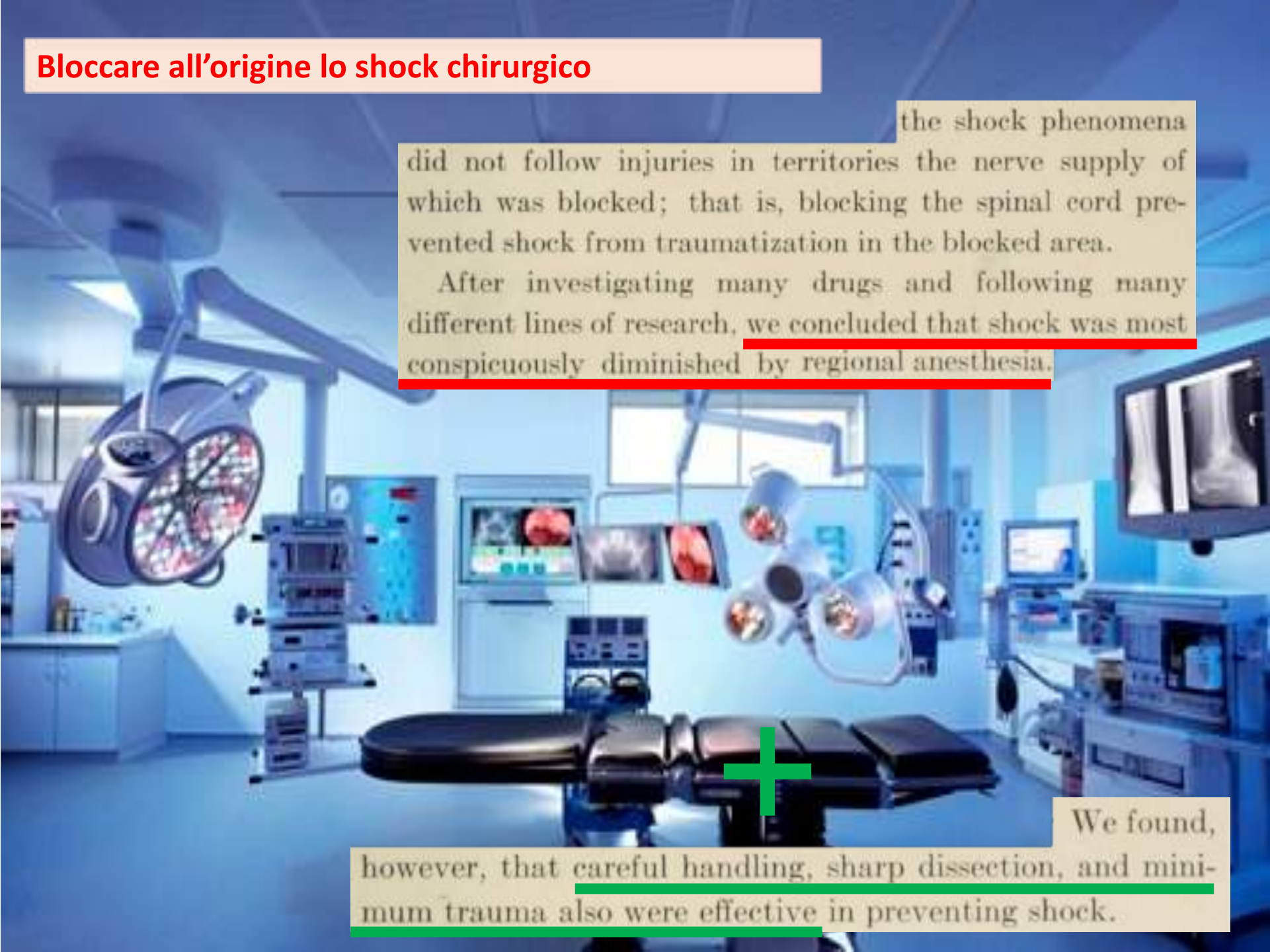
Y.-Y. K. Chen,¹  K. A. Boden² and K. L. Schreiber³ 

Bloccare all'origine lo shock chirurgico

the shock phenomena did not follow injuries in territories the nerve supply of which was blocked; that is, blocking the spinal cord prevented shock from traumatization in the blocked area.

After investigating many drugs and following many different lines of research, we concluded that shock was most conspicuously diminished by regional anesthesia.

We found, however, that careful handling, sharp dissection, and minimum trauma also were effective in preventing shock.





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EDITED BY
AMY F. ROWLAND

ORIGINAL ILLUSTRATIONS

PHILADELPHIA AND LONDON
W. B. SAUNDERS COMPANY
 1915

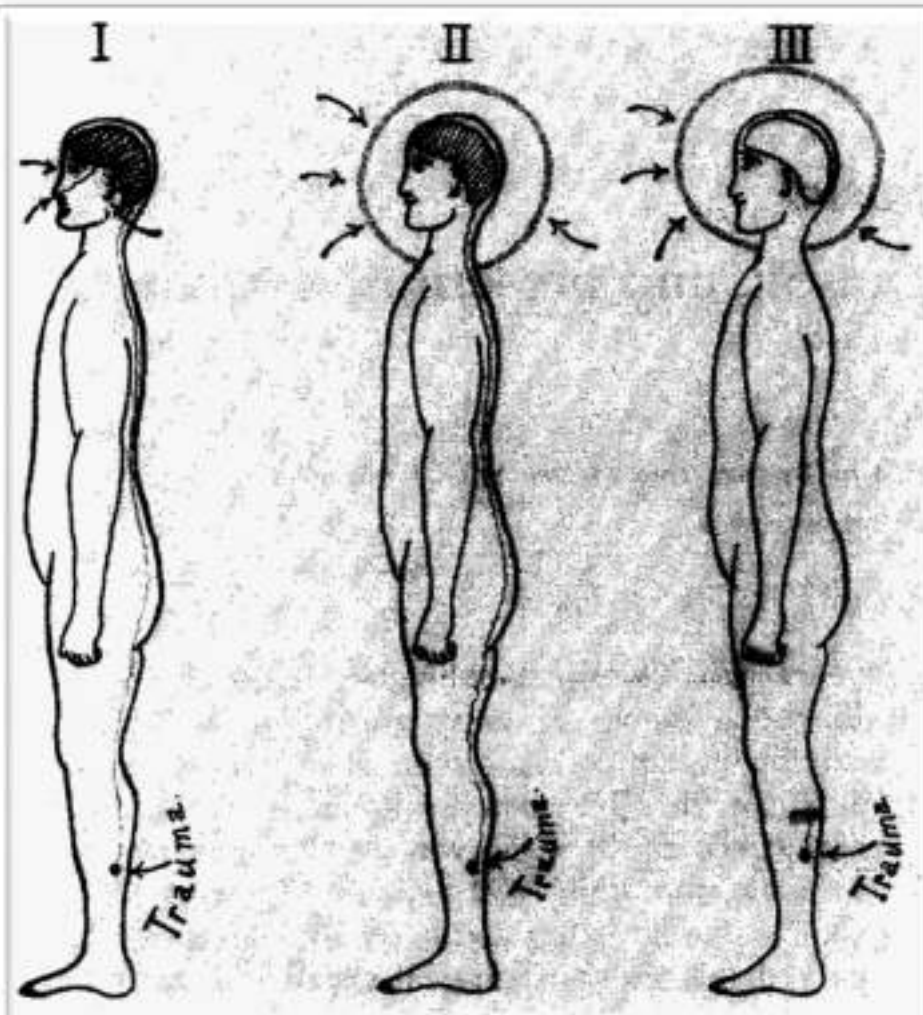


Fig. 1. Illustration of Crile's concept of anoci-association. I: in the conscious patient, auditory, olfactory, and visual input from special sense organs, and noxious somatic impulses from peripheral nociceptors are transmitted to the brain where they contribute to shock and exhaustion. II: under general anesthesia alone, noxious somatic impulses arising from trauma continue to reach the brain. III: the shockless operation achieved by complete anoci-association. Transmission of noxious auditory, olfactory, and visual impulses are prevented from reaching the brain with use of general anesthesia and noxious somatic impulses arising from the trauma are blocked by local anesthesia (reproduced from Crile and Lower 1914).

Targets and risk-factors

Peripheral nerve injury

Peripheral nerve activation

Local inflammatory response and neurogenic inflammation

Peripheral nerve sensitisation and continued ectopic activity

Changes in gene expression at dorsal root ganglion

Central sensitisation

Descending facilitation from the brainstem

Limbic system and hypothalamus

Cortical pain processing

Genomic DNA leading to predisposition to chronic pain

Intervention

- Nerve protective surgery

- **Regional anaesthesia**
- $Ca_v \alpha 2\text{-}\delta$ ligands (gabapentin, pregabalin)

- **Regional anaesthesia**
- Anti-inflammatory (COX-2, NSAIDs, paracetamol)

- **Regional anaesthesia**
- $Ca_v \alpha 2\text{-}\delta$ ligands (gabapentin, pregabalin)

- **Regional anaesthesia**
- Corticosteroids (dexamethasone)
- Anti-inflammatory (COX-2, NSAIDs)

- **Regional anaesthesia**
- NMDA receptor antagonists (ketamine, magnesium, dextromethorphan, memantine)
- Corticosteroids
- $\alpha\text{-}2$ adrenoreceptor agonists (clonidine, dexmedetomidine)
- Opioid receptor agonists

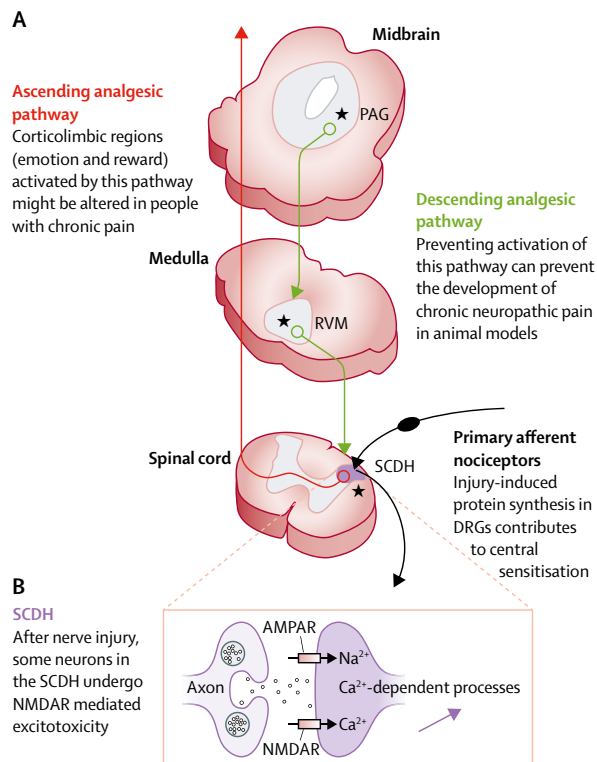
- **Regional anaesthesia**
- Anti-inflammatory (COX-2, NSAIDs, paracetamol)

- Behavioural interventions
- Antidepressants
- Anxiolytics

- **Regional anaesthesia**
- Assessment and pre-screening
- Support network
- Proper expectations

- Assessment and pre-screening
- Discussion regarding multimodal analgesia
- Proper expectations

NMDA, N-methyl-D-aspartate; COX-2, cyclooxygenase-2; NSAIDs, non-steroidal anti-inflammatory drugs.



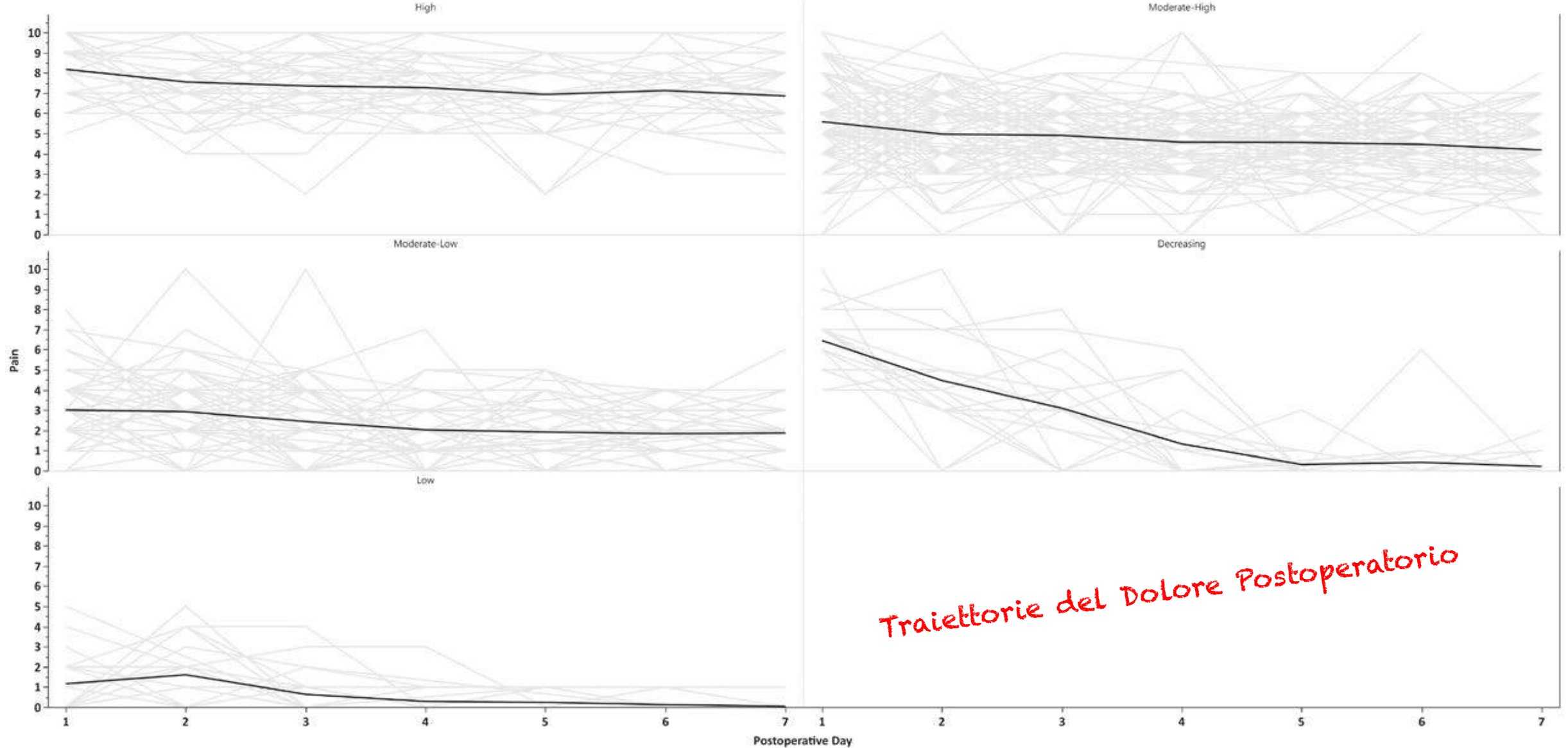
Pre-operative and intra-operative interventions

- › Paracetamol and NSAIDs or COX-2 specific inhibitors, administered either pre-operatively or intra-operatively
- › Single shot adductor canal block administered pre-operatively and peri-articular local infiltration analgesia administered intra-operatively. Combination of these two techniques is preferred
- › Dexamethasone (≥ 10 mg, IV) administered intra-operatively
- › Intrathecal morphine (100 μ g) may be considered only in hospitalised patients when surgery is performed under spinal anaesthesia and in the rare situation wherein both adductor canal block and local infiltration analgesia are not possible

Postoperative interventions

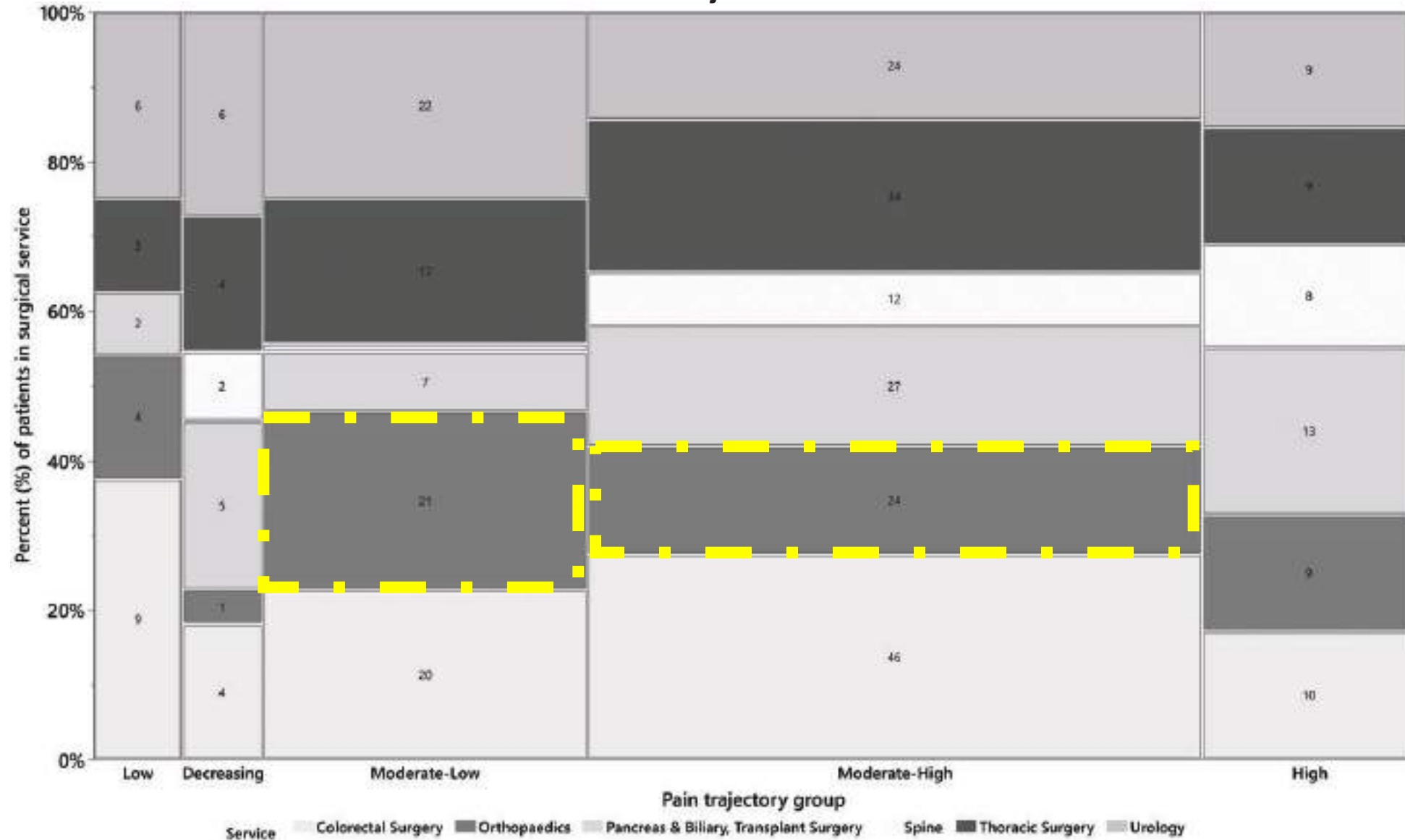
- › Paracetamol and NSAIDs or COX-2 specific inhibitors
- › Opioids should be reserved as rescue analgesics

Patient and Procedural Determinants of Postoperative Pain Trajectories



Traiettorie del Dolore Postoperatorio

**Patient and Procedural
 Determinants of
 Postoperative Pain
 Trajectories**



**Patient and Procedural
 Determinants of
 Postoperative Pain
 Trajectories**

Patient Demographics	Low (n = 25)	Decreasing (n = 22)	Moderate to Low (n = 88)	Moderate to High (n = 167)	High (n = 58)	P Value	
						Raw	False Discovery Rate
Age, mean yr ± SD	66 ± 13	63 ± 10	61 ± 13	58 ± 12	54 ± 12	< 0.001	< 0.001
Sex, n (%)						0.002	0.005
Male	19 (76%)	15 (68%)	49 (56%)	78 (47%)	20 (35%)		
Female	6 (24%)	7 (32%)	39 (44%)	89 (53%)	38 (65%)		
Race, n (%)						0.584	0.755
White	21 (84%)	19 (86%)	81 (92%)	138 (83%)	50 (86%)		
Black	2 (8%)	2 (9%)	3 (3%)	20 (12%)	2 (9%)		
Other	2 (8%)	1 (5%)	4 (5%)	9 (5%)	3 (5%)		
Ethnicity, n (%)						0.648	0.755
Hispanic	0 (0%)	0 (0%)	4 (5%)	6 (4%)	4 (7%)		
Non-Hispanic	25 (100%)	22 (100%)	84 (95%)	161 (96%)	54 (93%)		
Body mass index, mean ± SD	28.2 ± 5.4	29.9 ± 6.2	29.2 ± 6.9	29.7 ± 6.4	30.1 ± 6.8	0.821	0.821
Preoperative nerve block, n (%)	20 (80%)	16 (73%)	70 (80%)	125 (75%)	41 (71%)	0.750	0.800
Preoperative opioids (n = 160), n (%)	1/4 (2%)	4/10 (6%)	13/35 (19%)	30/71 (44%)	21/39 (30%)	0.616	0.755
Intraoperative ketamine, n (%)	6 (24%)	4 (18%)	20 (23%)	47 (28%)	18 (31%)	0.661	0.755
Intraoperative lidocaine, n (%)	6 (24%)	4 (18%)	25 (28%)	33 (20%)	12 (21%)	0.596	0.755
Intraoperative opioids, median oral morphine milligram equivalents (interquartile range)	55.0 (68.6)	63.5 (53.6)	45.0 (52.0)	65.0 (75.0)	78.0 (81.1)	0.047	0.094
Total postoperative opioids, median oral morphine milligram equivalents (interquartile range)	60.0 (70.6)	68.8 (199.5)	73.5 (108.3)	136.3 (165.9)	249.5 (330.3)	< 0.001	< 0.001

ANESTHESIOLOGY

Patient and Procedural Determinants of Postoperative Pain Trajectories

ANESTHESIOLOGY 2021; 134:421–34

Patient-Reported Outcomes
 Measurement Information System
 (**PROMIS**)

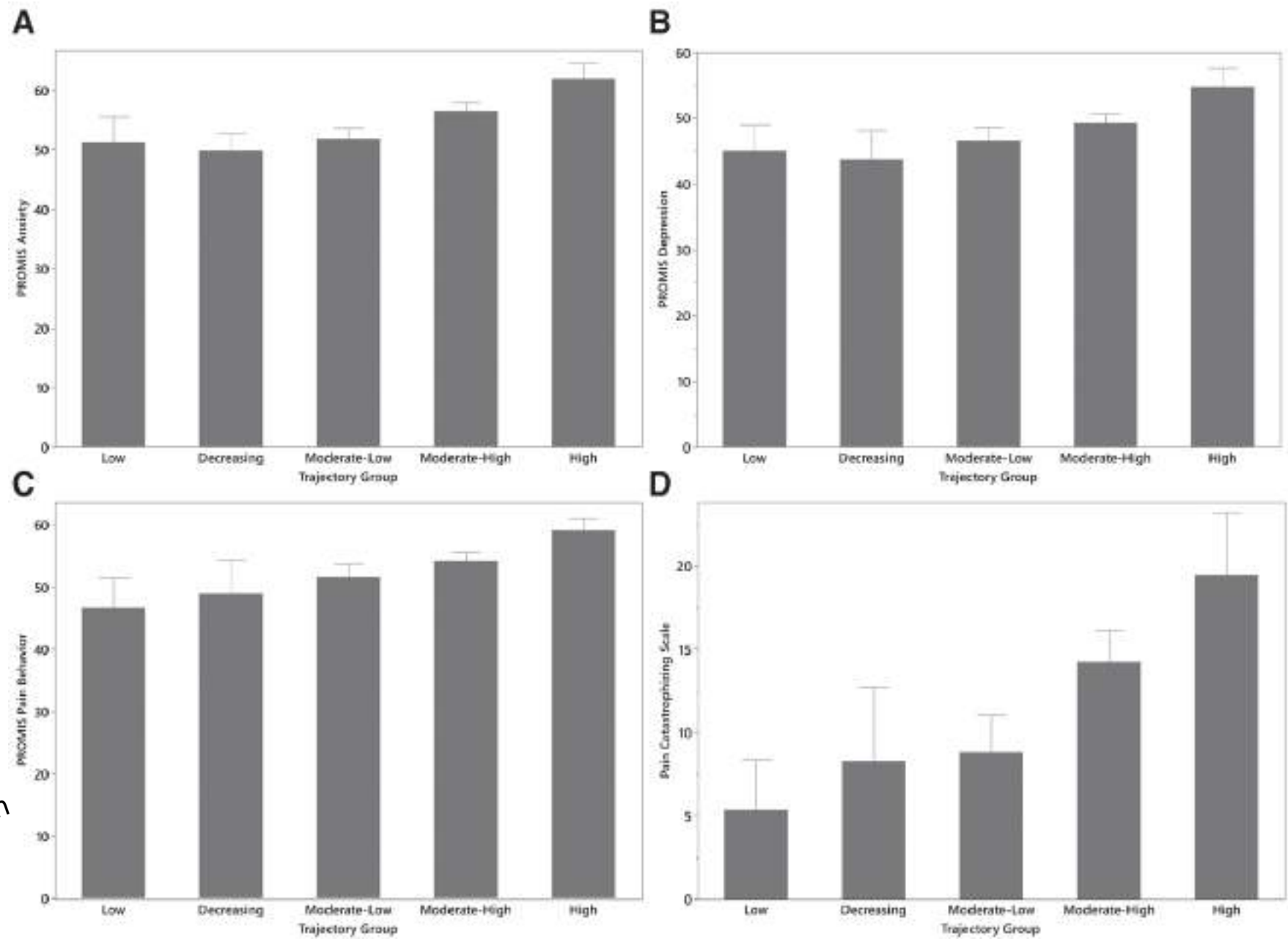


Fig. 6. Mean scores for Patient-Reported Outcomes Measurement Information System (PROMIS) anxiety (A), depression (B), and pain behavior scales (C) and Mean Pain Catastrophizing Scale score (D) across pain trajectory groups. Error bars indicate 95% CIs.

Predictive Factors of Chronic Post-Surgical Pain at 6 Months Following Knee Replacement: Influence of Postoperative Pain Trajectory and Genetics

Pain Physician 2016; 19:E729-E741 • ISSN 2150-1149

4 factors were associated with CPSP:

- 3 preoperative factors (high school diploma, consequences of the pain for walking ability, as assessed with BPIsf walk, and an absence of regular physical activity in adulthood),
- 1 postoperative factor (**APOP trajectory**).



Transition from acute to chronic pain after surgery

Paul Glare, Karin R Aubrey, Paul S Myles

Panel 1: Risk factors for chronic postsurgical pain

Demographics and lifestyle

- Age
- Gender
- Marital status or living arrangements
- Education level
- Employment status
- Compensation status
- Obesity
- Smoking

Genetic

- Candidate gene mutations associated with increased pain (eg, *COMT*, *OPRM1*, and *GCH1*)

Clinical

- Surgical factors, including surgical technique (open vs laparoscopic), duration of surgery, type of anaesthesia (general vs regional), and perioperative
- Analgesic regimen (systemic vs spinal and pre-emptive); surgical complications and re-operating
- Medical comorbidities
- Previous disability or pain interference

Preoperative pain (area of operation or elsewhere)

Postoperative pain (intensity and duration)

Psychological

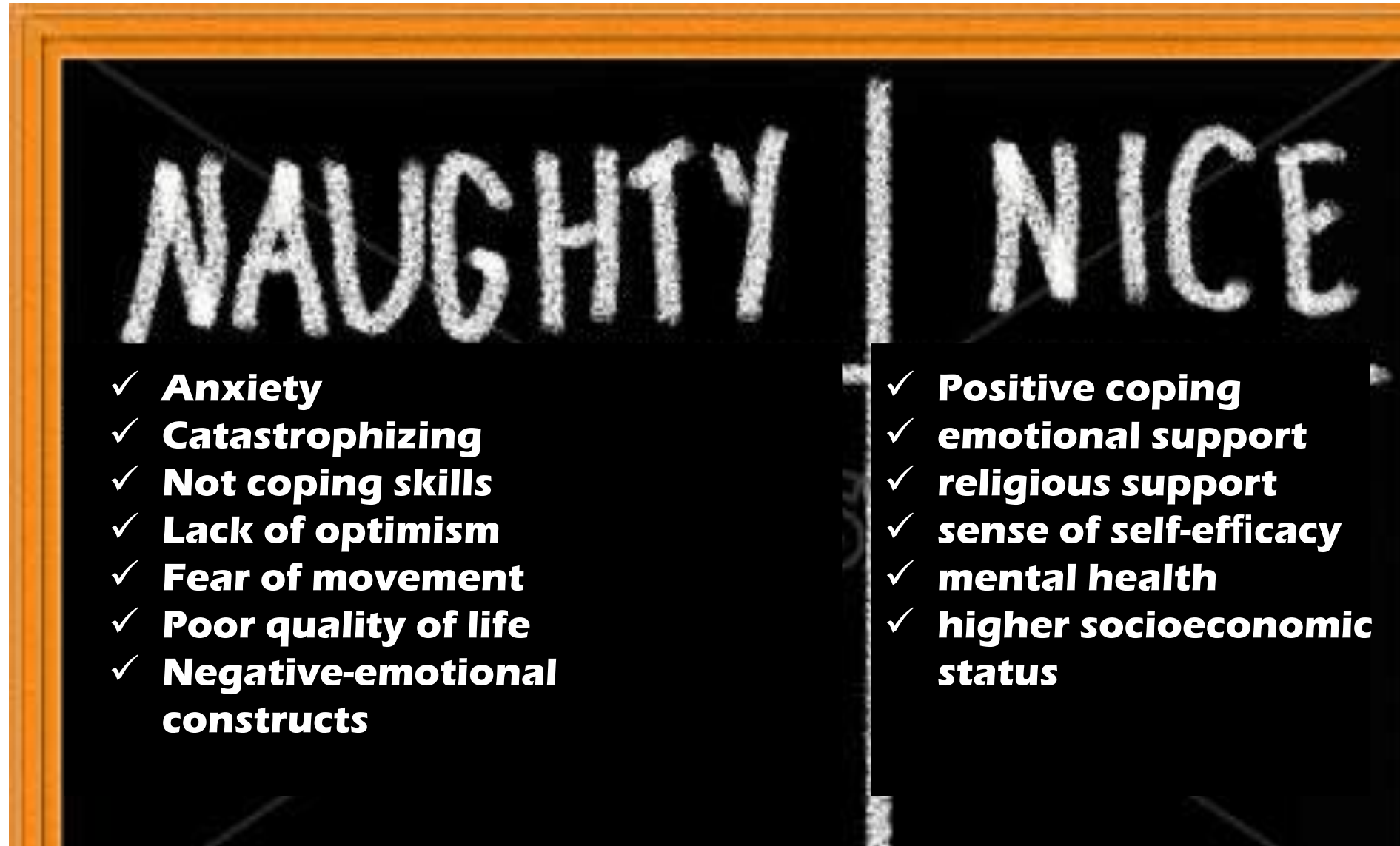
- Fear or anxiety
- Depression
- Pain catastrophising
- Other psychological issues (eg, vulnerability factors)

COMT=catechol-o-methyltransferase. *OPRM1*=opioid receptor mu 1.
GCH1=guanosine-5'-triphosphate cyclohydrolase 1.

PSYCHOSOCIAL FACTORS

Transition from acute to chronic pain after surgery

Paul Glare, Karin R Aubrey, Paul S Myles





Pain Catastrophizing Scale – PCS

Ognuno di noi prova esperienze dolorose durante la propria vita. Tali esperienze possono includere, ad esempio, mal di testa, mal di denti, dolore articolare o muscolare. Le persone sono spesso esposte a situazioni che possono causare dolore come le malattie, gli infortuni, o le procedure chirurgiche.

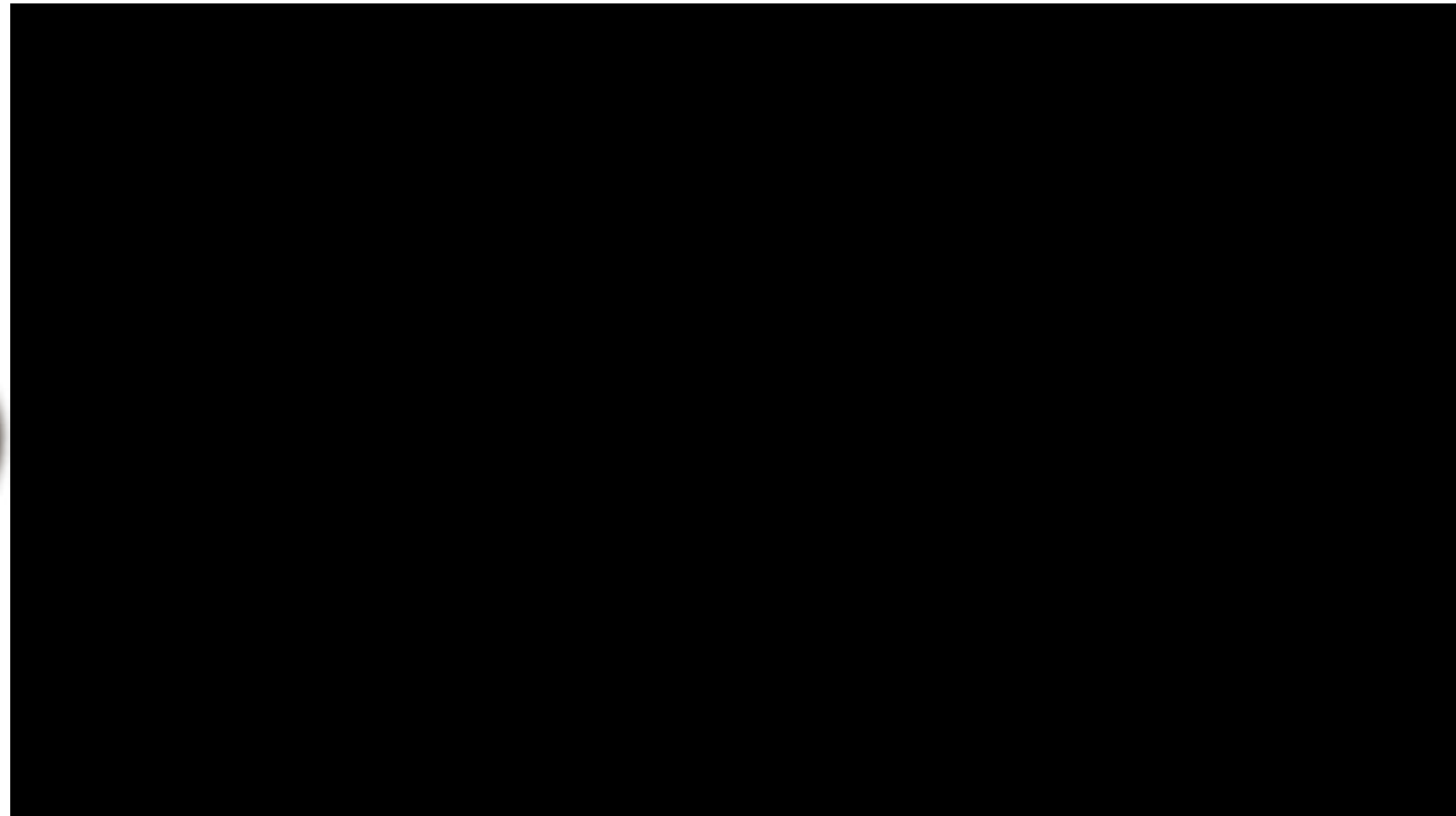
BECK DEPRESSION SCALE (BDI)

Nel questionario che segue troverà dei gruppi di affermazioni. Legga attentamente un gruppo per volta. Scelga da ciascun gruppo l'affermazione che meglio di tutte le altre descrive come si è sentita/durante la scorsa settimana, escluso oggi (tracci un cerchietto attorno al numero a sinistra della affermazione. Se le sembra che diverse affermazioni dello stesso gruppo la descrivono bene, faccia pure più di un cerchietto).

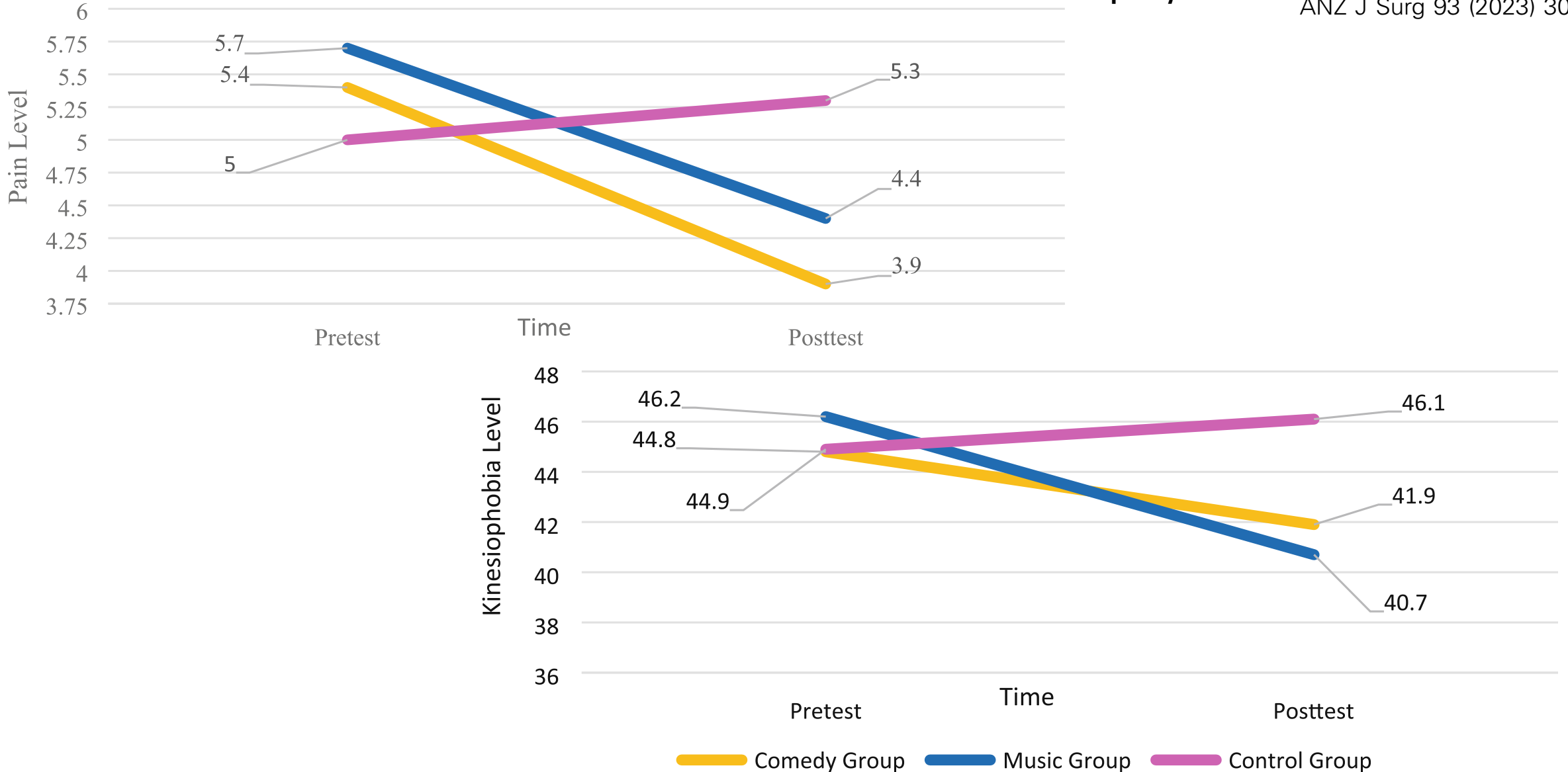
Patients' Global Impression of Change (PGIC) Scale

Effect of meditation music and comedy movie interventions on postoperative kinesiophobia and pain in patients undergoing total knee arthroplasty

ANZ J Surg 93 (2023) 302–309



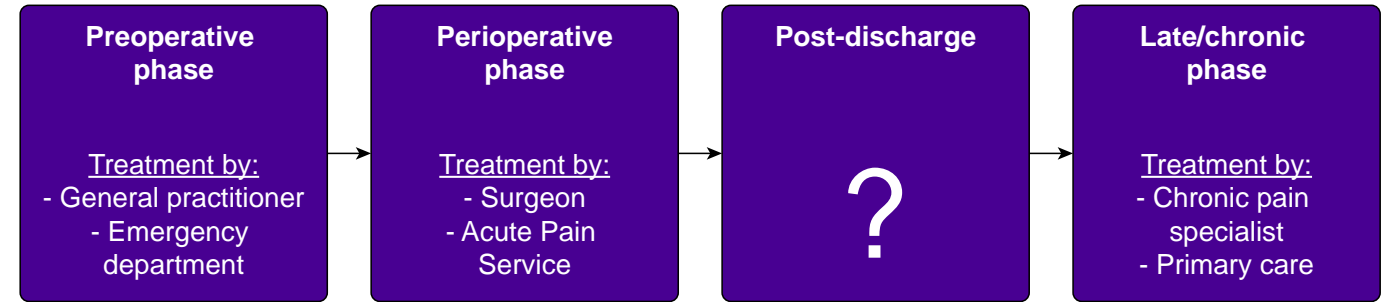
Effect of meditation music and comedy movie interventions on postoperative kinesiophobia and pain in patients undergoing total knee arthroplasty
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Transitional Pain Service

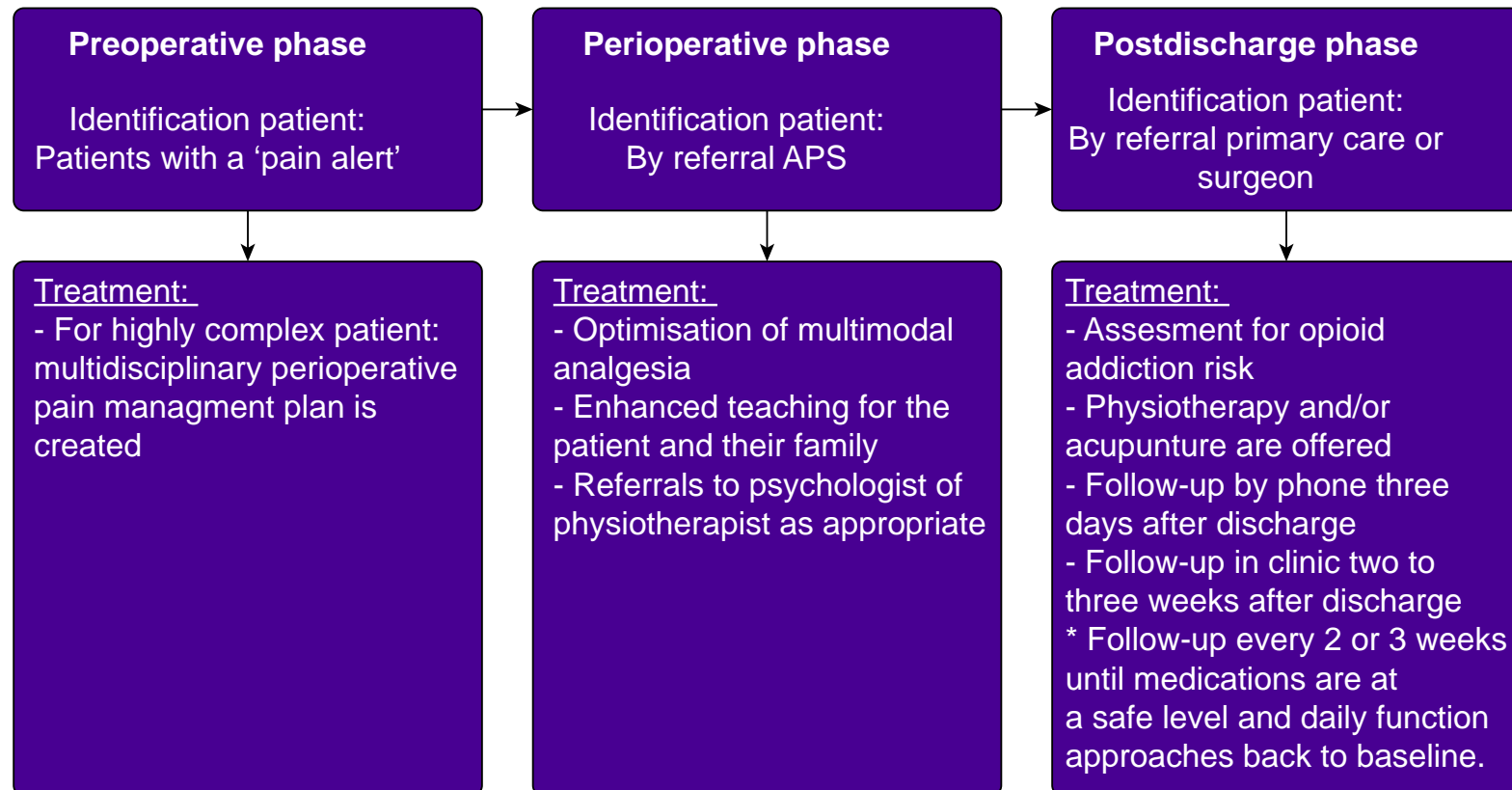
- identify patients at risk for transitioning from acute to chronic pain;
- prevent this by coordinated care throughout the whole perioperative process;
- Patients are assessed by the TPS postoperatively;
- a treatment plan is created before surgery.
- TPS nurse practitioners optimise a multimodal analgesia treatment plan
- educate the patient and their family on their analgesics and the importance of preventive analgesia.

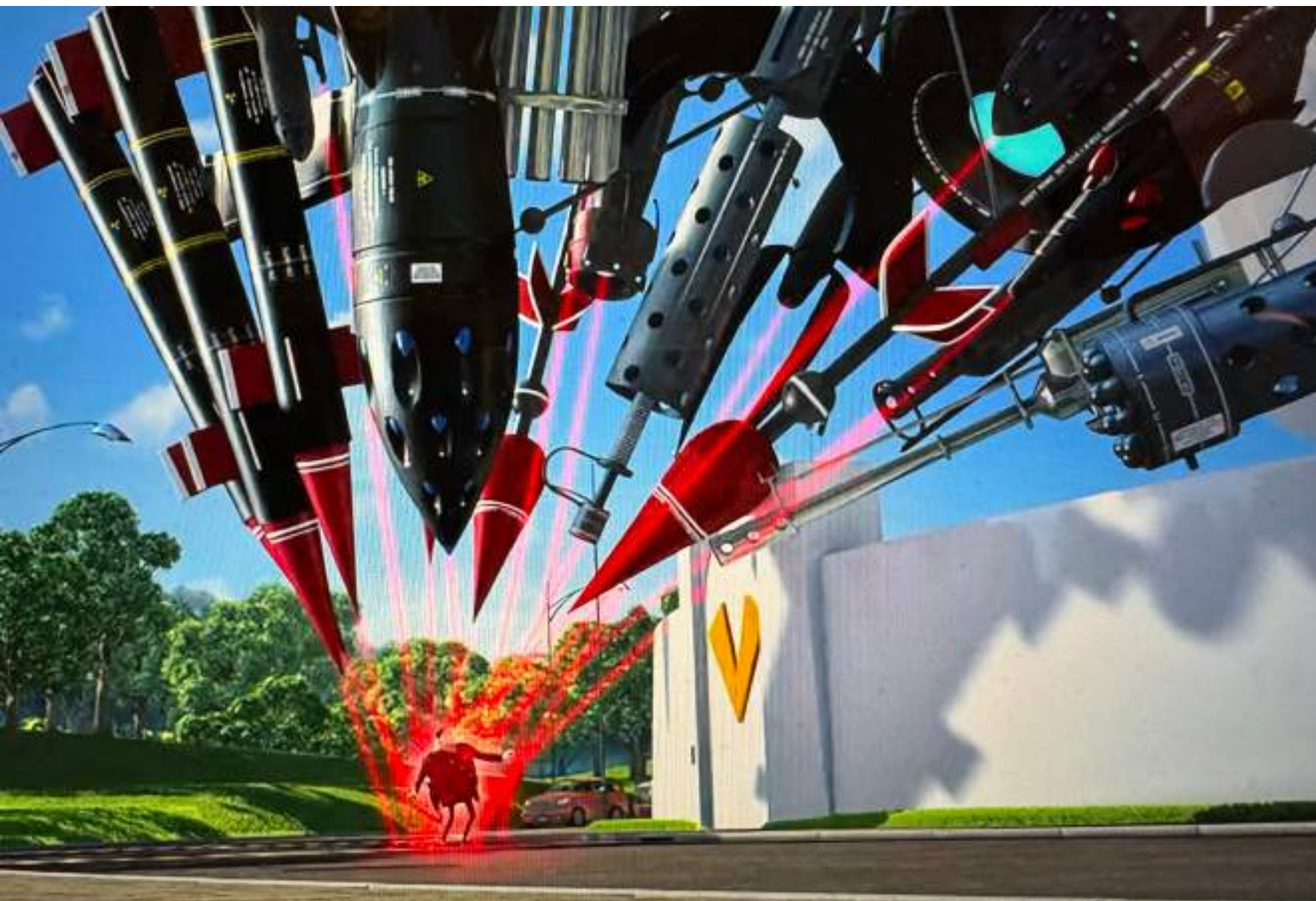
Current treatment paradigm for pain in the perioperative period



British Journal of Anaesthesia, 127 (3): 331–335 (2021)

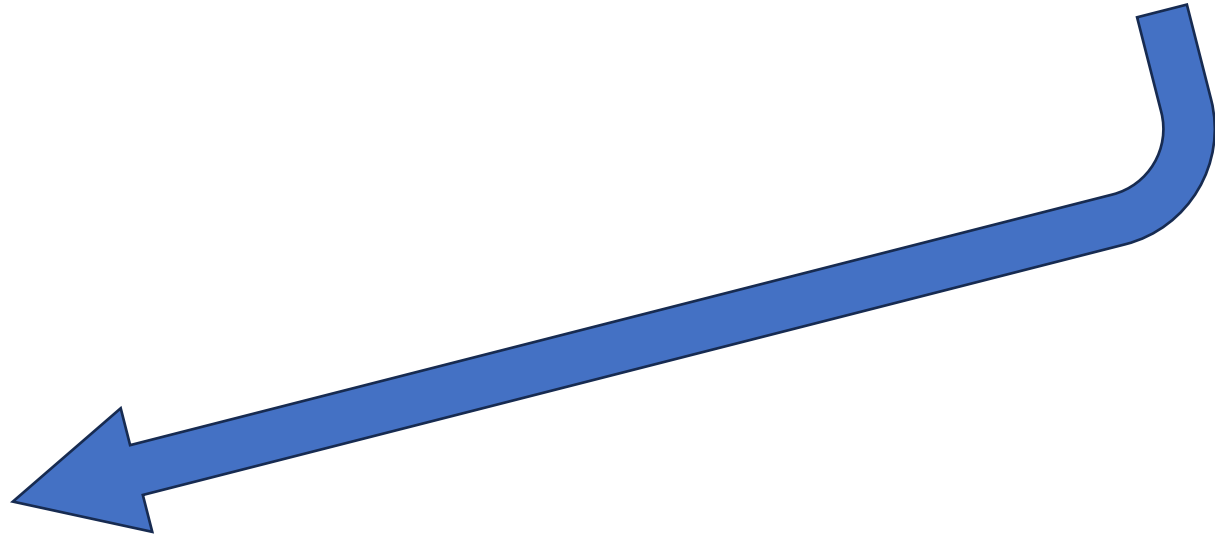
Implementation of a transitional pain service by Toronto General Hospital





Strategy is to employ every type of applicable analgesic intervention *pre-emptively* in all patients, with the goal of limiting or even eliminating the possible occurrence of poorly managed pain

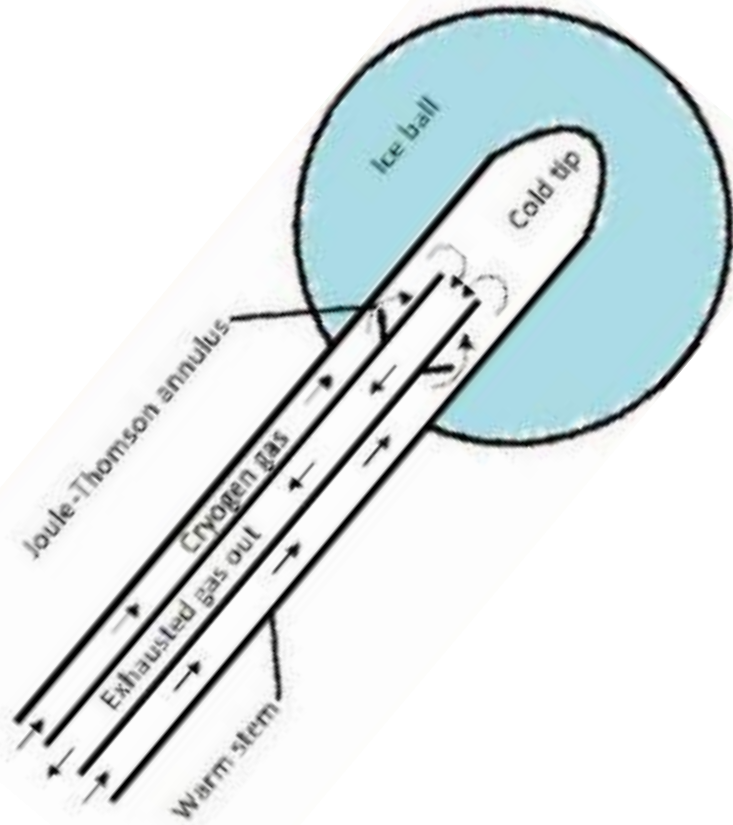
Practice-based evidence



Personalised approach



CRYONEUROLYSIS



Superior Lateral
Genicular Nerve



Superior Medial
Genicular Nerve



Inferior Medial
Genicular Nerve





A Multimodal Pain Management Protocol Including Preoperative Cryoneurolysis for Total Knee Arthroplasty to Reduce Pain, Opioid Consumption, and Length of Stay

[Arthroplasty Today 10 \(2021\) 87–92](#)

This retrospective study suggests that, when added to a multimodal TKA pain protocol, **preoperative cryoneurolysis** provides *superior pain control* and allows patients to take *fewer opioids* during hospitalization and during the 6-week recovery period than a multimodal TKA pain protocol alone.

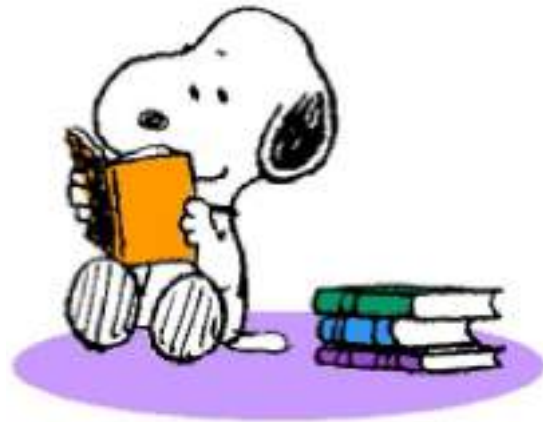


Cryoneurolysis before Total Knee Arthroplasty in Patients With Severe Osteoarthritis for Reduction of Postoperative Pain and Opioid Use in a Single-Center Randomized Controlled Trial

[The Journal of Arthroplasty 36 \(2021\) 1590–1598](#)

Preoperative cryoneurolysis may be considered as a part of multimodal pain management to *minimize opioid use* while reducing pain and improving knee function after surgery.

CURIOSITÀ PER
APPROFONDIRE



DESIDERIO
DI METTERE
IN PRATICA



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Grazie!

