

Regionálna anestézia ako štandardný nástroj v prevencii **chronickej** **po-operačnej bolesti**

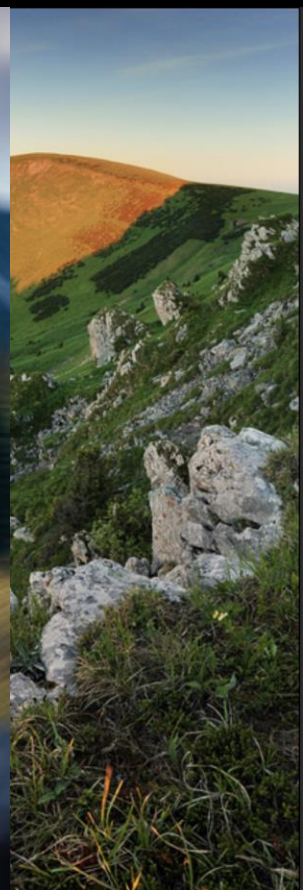
MUDr. Michal Venglarčík, PhD., ESRA-DRA

XXXII. Kongres ČSARIM 2026

Vyhlásenie o konflikte záujmov autora

Nemám konflikt záujmov







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Chronická pooperačná bolesť

- Chronická pooperačná bolesť **(CPSP)** je definovaná ako bolesť v oblasti chirurgického zákroku pretrvávajúca **najmenej 3 – 6 mesiacov po operácii.**
- Jej výskyt sa medzi chirurgickými zákrokmi značne líši, **od menej ako 10 % do 50 %.**
- **CPSP** môže byť spojená s významným zhoršením funkcie, **nárastom morbidity a mortality.**

From PPP(1999) to CPSP(2019)

British Journal of Anaesthesia **113** (1): 1–4 (2014)

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EDITORIAL I

Defining persistent post-surgical pain: is an update required?

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² Division of Emergencies and Critical Care, Department of Anaesthesiology, Oslo University Hospital and Medical Faculty, University of Oslo, Oslo, Norway

Chronic postsurgical pain and transitional pain services: a narrative review highlighting European perspectives

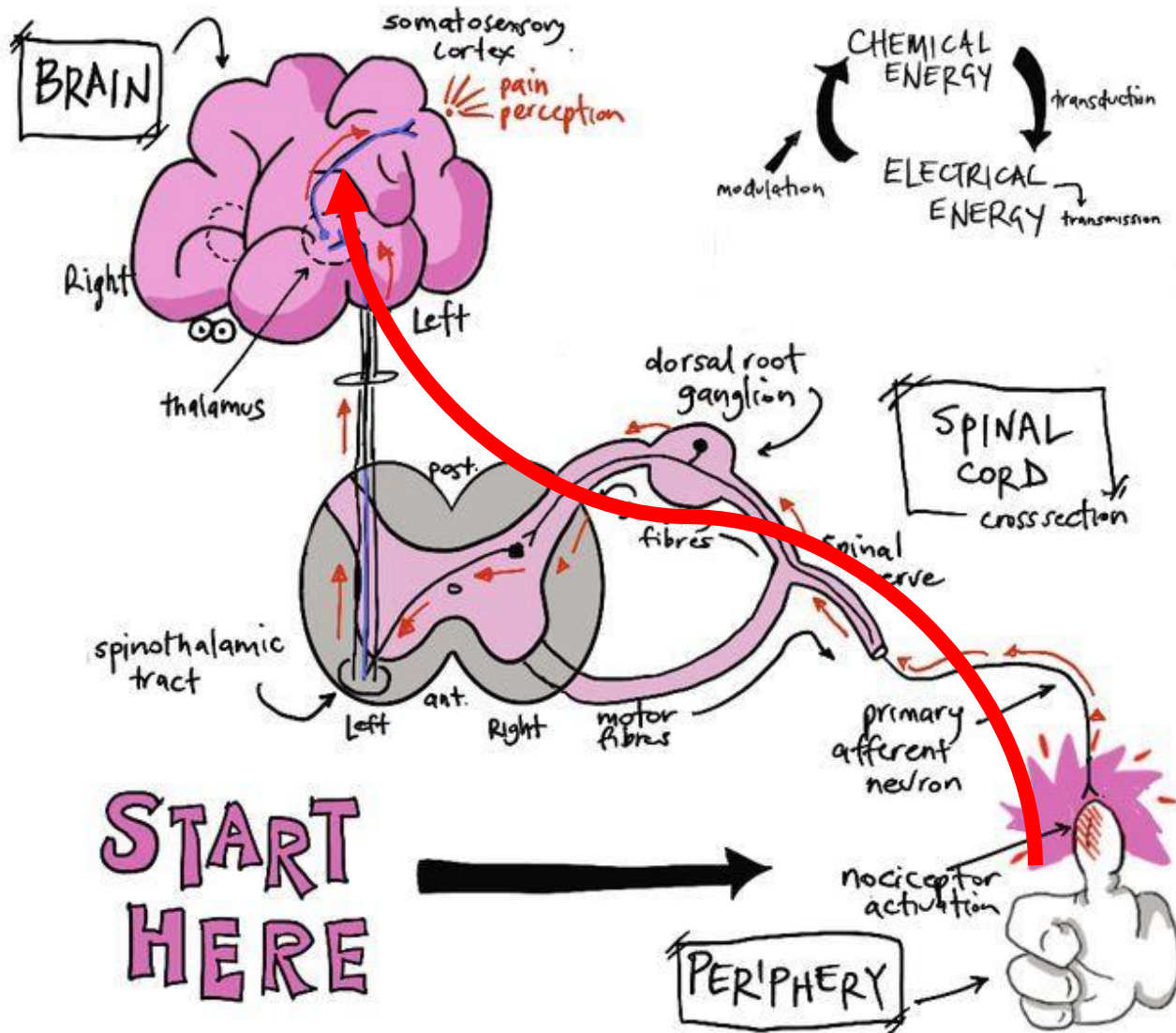
Eleni Moka ,¹ José Alejandro Aguirre,² Axel R Sauter ,³ Patricia Lavand'homme,⁴

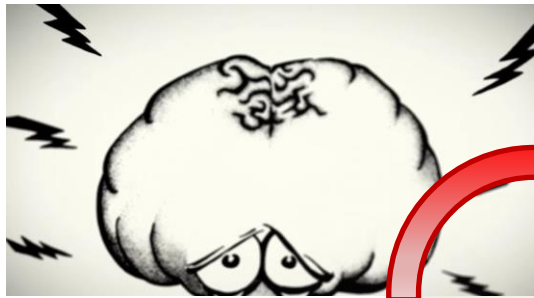
On behalf of the European Society of Regional Anaesthesia and Pain Therapy (ESRA)

PAIN

PATHWAYS₂ ASCENDING

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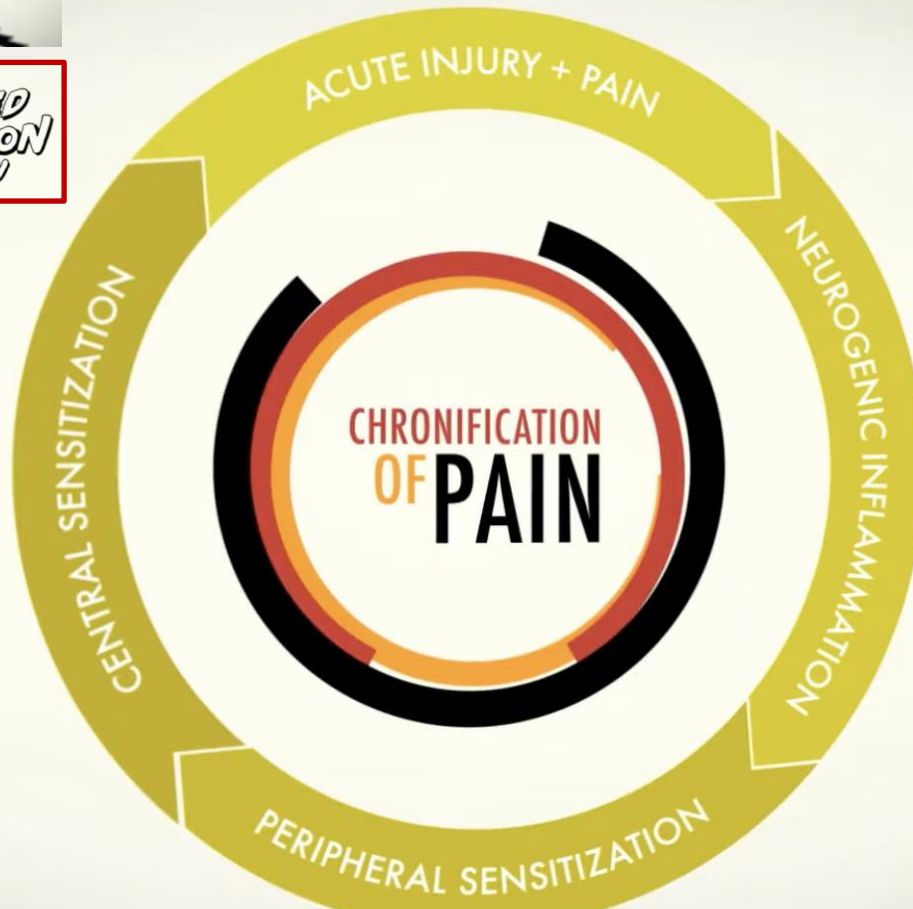




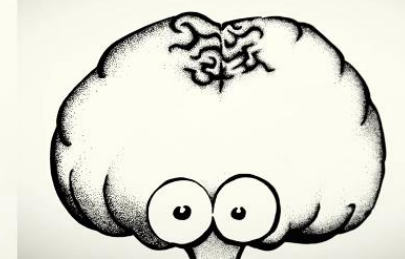
**PERIPHERAL
STIMULI
TRANSMISSION**

PAIN + **STRESS
WORRY
ANXIETY** = **INCREASED
ATTENTION
TO PAIN**

**ANXIETY
DISORDER**
**SLEEP
DISORDER**
**MOOD
DISORDER**



**CENTRAL
NERVOUS
SYSTEM
PROCESSING**



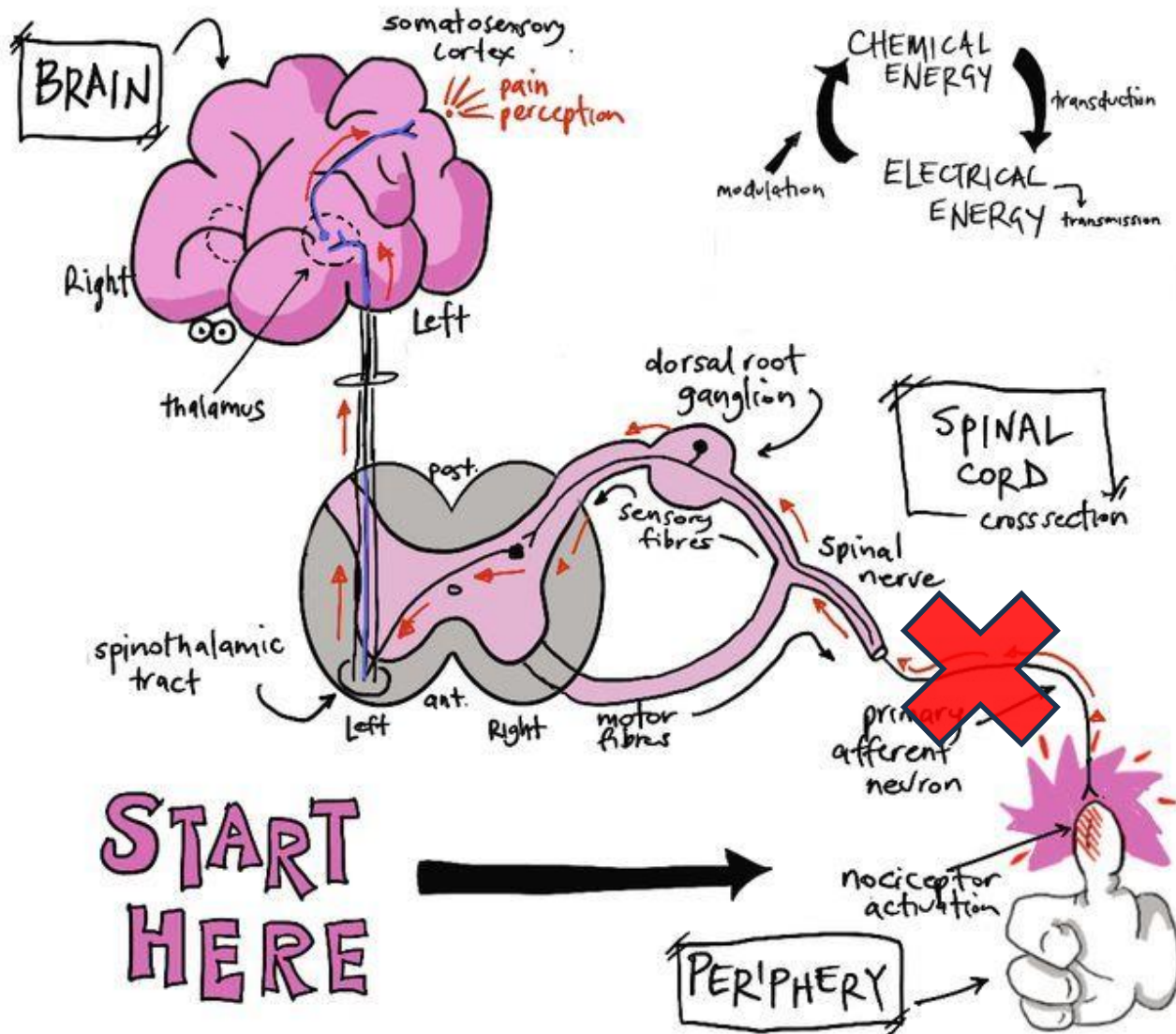
**CONTINUATION
OF PAINFUL
STIMULUS**

HYPERALGESIA

PAIN

PATHWAYS₂ ASCENDING

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Chronic post-surgical pain – update on incidence, risk factors and preventive treatment options

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BJA Education, 22(5): 190–196 (2022)



Regional anaesthesia

Perioperative regional anaesthesia has been shown to reduce the risk of CPSP in most types of surgery studied so far.³¹ By blocking nociceptive input to the central nervous system, central sensitisation processes can be reduced if not prevented. Epidural analgesia reduces the incidence of CPSP in patients undergoing thoracotomy.³¹ Paravertebral blocks can reduce CPSP after thoracotomy and possibly have an impact on development of neuropathic CPSP in breast cancer surgery.³¹ Continuous wound infiltration may reduce chronic pain after Caesarean section and harvesting of bone grafts from the iliac crest. However, the level of evidence is low. In most studies, only single-shot procedures are evaluated, although longer treatment duration might increase the effectiveness.²⁵

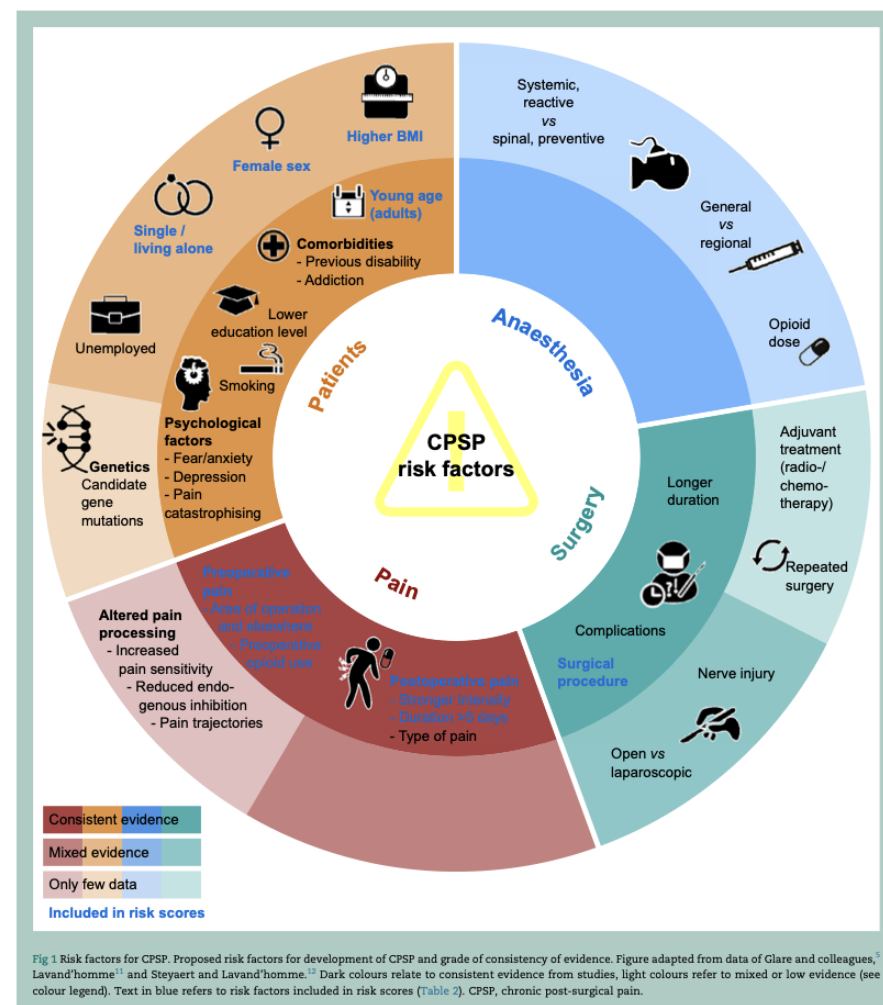
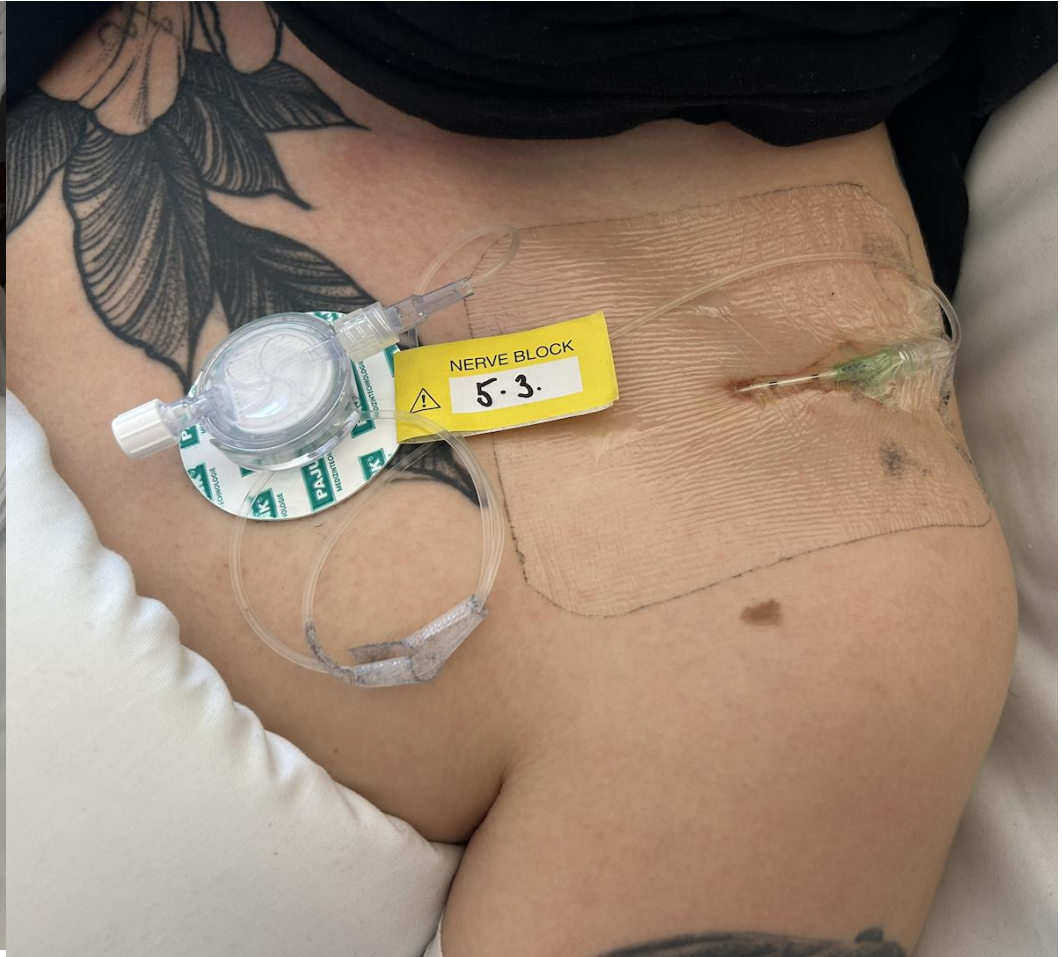


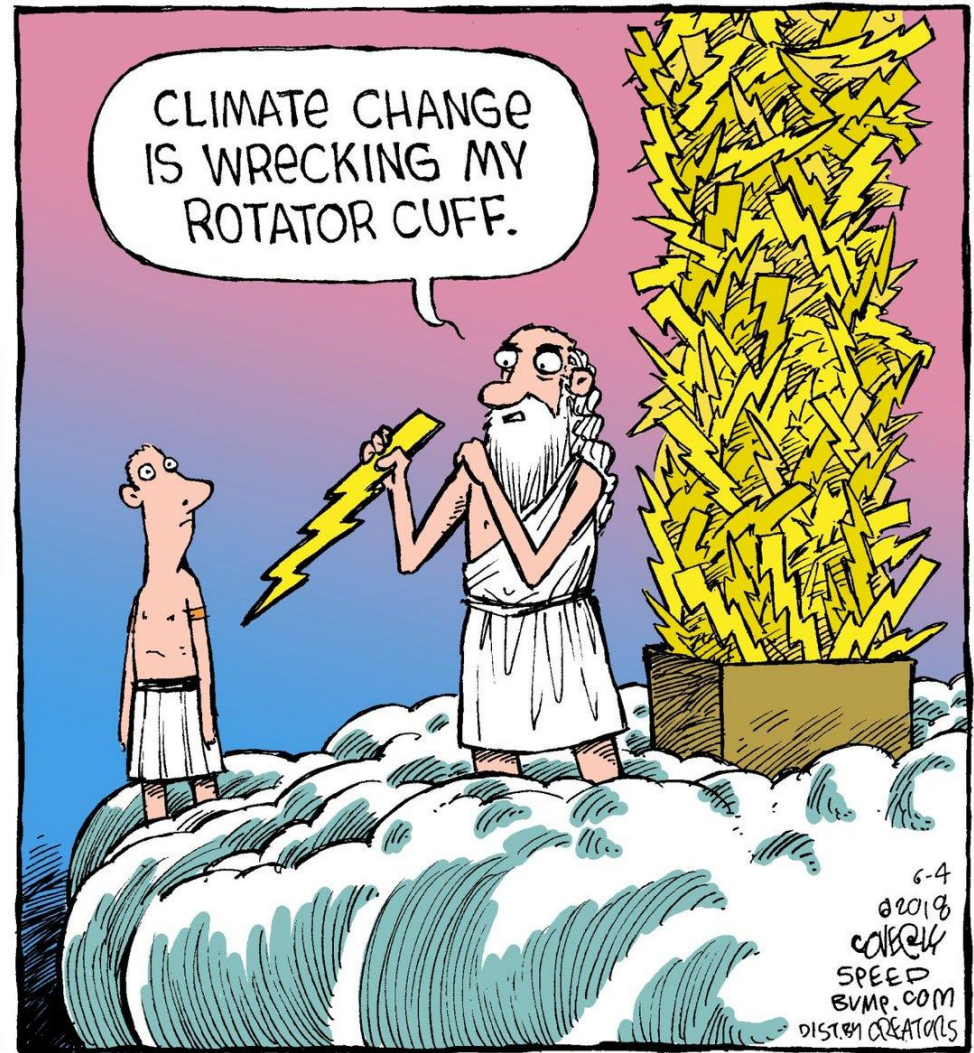
Fig 1 Risk factors for CPSP. Proposed risk factors for development of CPSP and grade of consistency of evidence. Figure adapted from data of Clare and colleagues,⁵ Lavand'homme¹¹ and Steyaert and Lavand'homme.¹² Dark colours relate to consistent evidence from studies, light colours refer to mixed or low evidence (see colour legend). Text in blue refers to risk factors included in risk scores (Table 2). CPSP, chronic post-surgical pain.





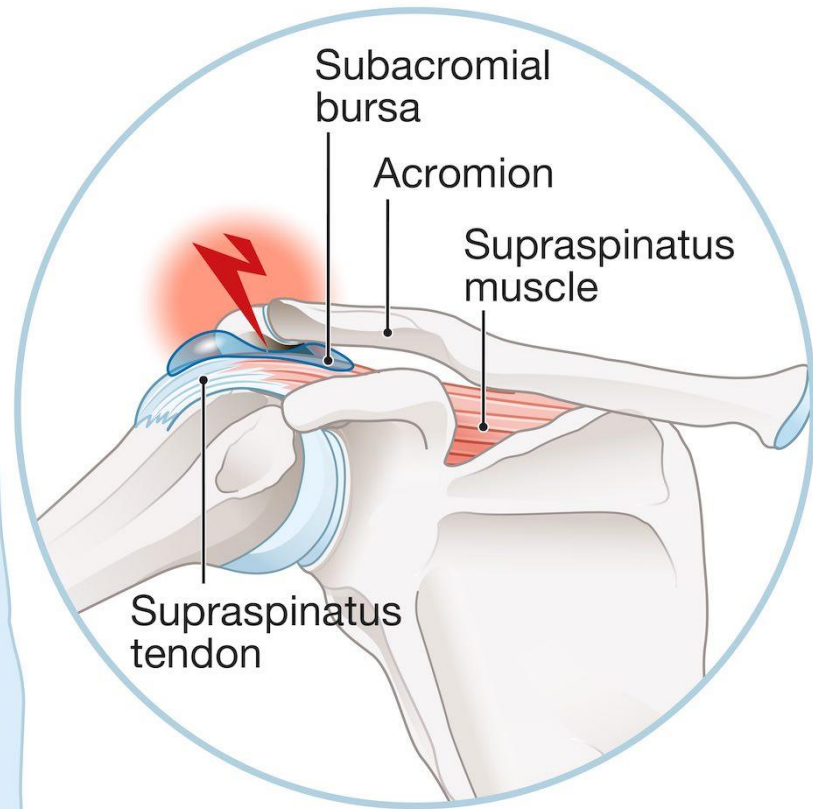
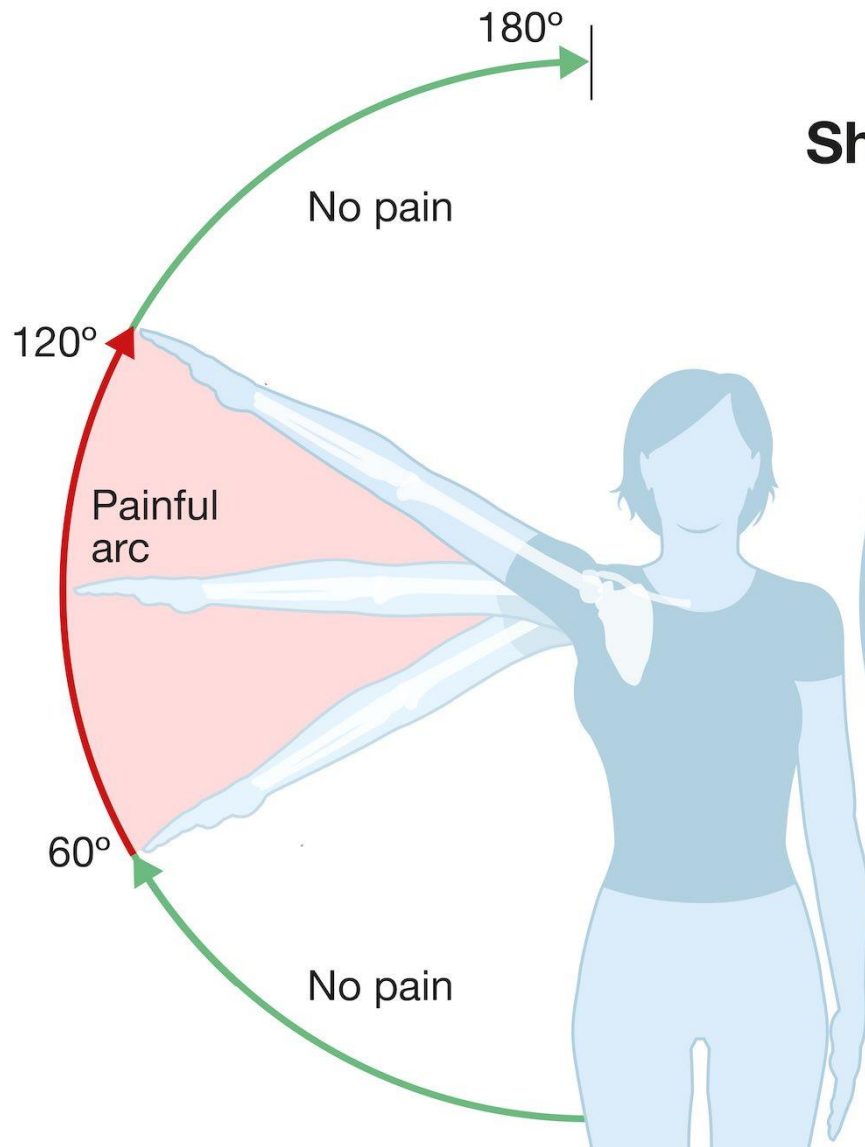


TWO MAIN DIAGNOSES

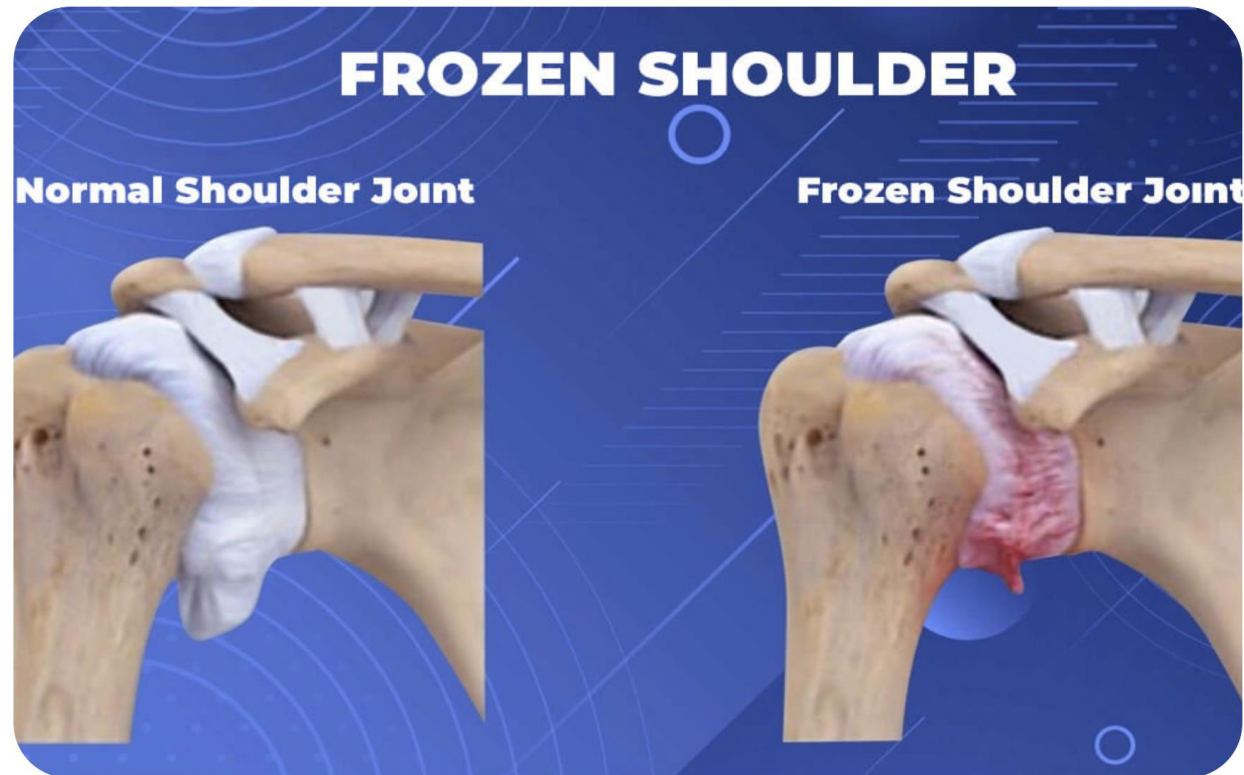
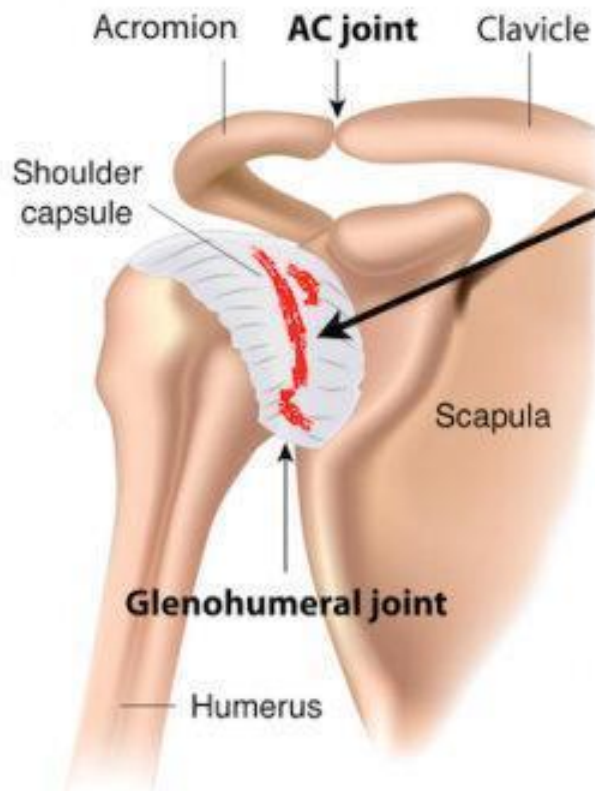


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Shoulder impingement syndrome



Frozen Shoulder (Adhesive Capsulitis)

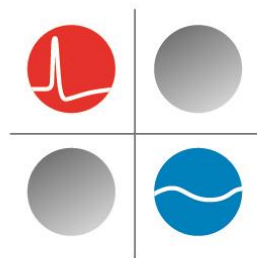


OK ...
NOW
WHAT?



prospect

procedure specific postoperative pain management



- **Od roku 2014** publikoval PROSPECT **24 odporučení** pre využitie techník regionálnej anestézie pri **konkrétnych operačných výkonoch**.
- **Posledné** doporučená sú z roku **2026**
- Je to **komplexný pohľad** na **pooperačný manažment bolesti**

Operačný výkon
2018
LSK Hysterectómia
2019
Operácie prsníka
Inguinálna hernia
Resekcia pečene
Operácie rotátorovej manžety
Tonsilectómia
TEP bedra
2020
Spondylochirurgia
Laminectómia
Prostatectómia
Sternotómia
TEP kolena
2021
VATS hrudníka 2021
Fraktúra bedra 2021
Kraniotómia 2021
2022
Open kolorektálna chirurgia
Apendectómia
LSK cholecystektómia
LSK kolorektálne chirurgia
Hemoroidektómia
2023
Operácia rážstepu podnebia
Vaginálny pôrod/Episiotómia
2026
Thorakotómia
Operácie Halux Valgus
LSK Sleeve Gastrectómia
Cisársky rez



Local analgesia techniques

- If intrathecal morphine is not used, the following are recommended, intra-operatively after delivery: local anaesthetic wound infiltration (single injection) or continuous wound infusion and/or regional analgesia techniques (fascial plane blocks such as transversus abdominis, transversalis fascia, quadratus lumborum, erector spinae plane or ilio-inguinal/iliohypogastric).

Better Postoperative Pain Management

Recommendations on this website are in the process of being updated. Please check back regularly for both updated content and new procedures

New: Caesarean Section

New: Open thoracotomy

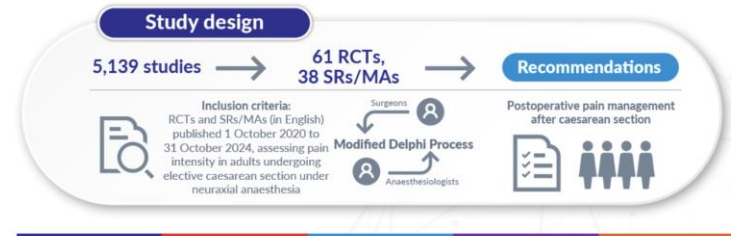
New: Hallux Valgus Repair Surgery

New: Laparoscopic Sleeve Gastrectomy



Recommendations for caesarean section

An updated systematic review with recommendations for postoperative pain management



Regional analgesia

- Pre-operative intrathecal long-acting opioid (i.e. morphine 50–100µg or diamorphine up to 300µg) is recommended.
- Epidural morphine 2–3mg or diamorphine up to 2–3mg may be used as an alternative when an epidural catheter is used in the primary anaesthetic technique.



Local analgesia techniques

- If intrathecal morphine is not used, the following are recommended, intra-operatively after delivery: local anaesthetic wound infiltration (single injection) or continuous wound infusion and/or regional analgesia techniques (fascial plane blocks such as transversus abdominis, transversalis fascia, quadratus lumborum, erector spinae plane or ilio-inguinal/iliohypogastric).

Recommendations for rotator cuff repair surgery

A systematic review with recommendations for
postoperative pain management

Study design

3069 studies
identified



60 studies
included



Recommendations



Inclusion criteria:
RCTs and SRs (in English)
published 1 January 2006
to 15 April 2019,
assessing pain intensity in
patients undergoing
rotator cuff repair surgery

Modified Delphi Process



Postoperative pain management
after rotator cuff repair surgery



Systemic (basic) analgesia



Paracetamol and NSAIDs/COX-2-specific inhibitors are recommended, administered pre-operatively or intra-operatively and continued postoperatively, unless contraindicated.



Regional analgesia



Interscalene brachial plexus blockade (single-shot or continuous)

is recommended as the first-choice. Suprascapular nerve block with or without axillary nerve block is recommended as an alternative to interscalene block (but not as the first choice).



Opioids



Should be reserved for rescue analgesia.



Surgical technique



Whenever possible, rotator cuff repair should be performed using an arthroscopic approach.







REGIONÁLNA ANESTÉZIA NA II. KAIM SZU v BB

SPINÁLNA ANESTÉZIA					
TRVANIE	TYP VÝKONU	LOKÁLNE ANESTETIKUM	DÁVKA	POZN.	
> 3 h.	revízie TEP CGG a periprotetické fx	0.5 % L-bupi	10 - 12.5 mg + SFNT 2.5 mcg		
1-3 h.	TEP CGG, ACL, PFN	0.5 % L-bupi	10 - 12.5 mg		
< 1 h.	ASK kolena, URO, GYN, sínus ...	2 % Prilo	40 - 60 mg (max 80 mg)	SAB na sále, chirurgovia nach ťahajú	
< 1 h.	Hamoroidy, vulva, perineum, TURB	SEDLOVÝ BLOK 2 % Prilo	10 - 20 mg		
CSA	I VÝZDY LEN V PRACOVNÝ DEŇ A PO KONZULTAGII RA TEAMU I		5 mg, potom 2.5 mg podľa potreby		

VÝKONY NA HORNEJ KONČATINE					
VÝKON	TYP BLOKU	LA	POZN.		
		Anestetická blokáda	Analgetická blokáda		
RAMENNÝ KLB	ISB	0.5 % L-bupi 10-15 ml	0.25 % L-bupi	07-10 ml	
RAMENNÝ KLB	Phrenic nerve sparing ANB + SSNB		0.25 % L-bupi	5 ml + SSB 5 ml)	
HUMERUS	ISB	0.5 % L-bupi 10-15 ml	0.25 % L-bupi	07-10 ml	
LAKEŤ	SCB	0.5 % L-bupi 20 ml	0.25 % L-bupi	15-20 ml	turniket!
PROXIMÁLNE PREDLAKTIE	AxB/SCB	0.5 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml	0.25 % L-bupi	AB:20 ml (8/8/4) SCB: 20 ml	turniket!
DIST. PREDLAKTIE/ZÁPÄSTIE	AxB/SCB	0.5 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml	0.25 % L-bupi	AB:20 ml (8/8/4) SCB: 20 ml	turniket!
CHIRURGIA RUKY	AxB/SCB	0.5 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml	0.25 % L-bupi	AB:20 ml (8/8/4) SCB: 20 ml	turniket!
KLAVIKULA	stredná 1/3	blokády nervov na predlakti	2-3 ml ku každému nervu	1% Lido	
		CF + CPFB	10 ml + 10 ml 0.25% + 10 ml 0.5% L-bupi	10 ml + 10 ml 0.25% + 10 ml 0.25% L-bupi	
		CF + CPFB + ISB	10 ml + 10 ml 0.25% + 5 ml 0.5% + 5 ml 0.5% L-bupi	10 ml + 10 ml 0.25% + 5 ml 0.25% + 5 ml 0.25% L-bupi	

VÝKONY NA DOŁNEJ KONČATINE					
VÝKON	TYP BLOKU	LA	POZN.		
		Anestetická blokáda	Analgetická blokáda		
BEDRO	TEP, CCP, PFN, LFN	FICB	0.25 % L-bupi + Adr	40 ml	
FEMUR	dialžka femuru	FENG	0.25 % L-bupi + Adr	20 ml	
		FNB + cut fem lat	0.5 % L-bupi	20 ml + 5 ml	



FNŠP F. D. Roosevelta
BANSKÁ BYSTRICA

VÝKONY NA HORNEJ KONČATINE

VÝKON	TYP BLOKU	LA	POZN.
		Anestetická blokáda	Analgetická blokáda
RAMENNÝ KLB	ISB	0.5 % L-bupi 10-15 ml	0.25 % L-bupi 07-10 ml
RAMENNÝ KLB	Phrenic nerve sparing ANB + SSNB		0.25 % L-bupi 5 ml + SSB 5 ml)
HUMERUS	ISB	0.5 % L-bupi 10-15 ml	0.25 % L-bupi 07-10 ml
LAKEŤ	SCB	0.5 % L-bupi 20 ml	0.25 % L-bupi 15-20 ml
PROXIMÁLNE PREDLAKTIE	AxB/SCB	0.5 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml	0.25 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml
DIST. PREDLAKTIE/ZÁPÄSTIE	AxB/SCB	0.5 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml	0.25 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml
CHIRURGIA RUKY	AxB/SCB	0.5 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml	0.25 % L-bupi AB:20 ml (8/8/4) SCB: 20 ml
KLAVIKULA	blokády nervov na predlakti	2-3 ml ku každému nervu	1% Lido
	stredná 1/3 CF + CPFB	10 ml + 10 ml 0.25% + 10 ml 0.5% L-bupi	10 ml + 10 ml 0.25% + 10 ml 0.25% L-bupi
	laterálna 1/3 CF + CPFB + ISB	10 ml + 10 ml 0.25% + 5 ml 0.5% + 5 ml 0.5% L-bupi	10 ml + 10 ml 0.25% + 5 ml 0.25% + 5 ml 0.25% L-bupi

RAD. MASTECTOMIA	TS - 4 - 5	PVB / ESPB + SPB + PSB	20 ml + 10 ml + 5 ml
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CIEVNA CHIRURGIA							
VÝKON	OBLASŤ	TYP BLOKU			LA	POZN.	
			Anestetická blokáda		Analgetická blokáda		
CEA	krk	CPB (C4 aj C3)	0.5 % L-bupi 10 ml + 2% Lido 10 ml	10 ml + 10 ml			
AV FISTULA	predlaktie	AxB/SCB	0.5 % L-bupi 10 ml + 2% Lido 10 ml	20 ml			
	rameno (sulcus bicipitalis)	SCB + ICB	0.5 % L-bupi 10 ml + 2% Lido 10 ml	15 + 5 ml			
AMPUTÁCIA	prsty	PB	0.5 % L-bupi alebo 2% Lido	20 ml			
	pod kolenom	FNB + PB	0.5 % L-bupi alebo 2% Lido	10 + 10 ml	0.25 % L-bupi alebo 1 % Lido	10 + 10 ml	
	nad kolenom (voľaj RA team)	FNB + TG/SG/PS + NCFL + ONB	0.5 % L-bupi alebo 2% Lido	10 + 10 + 5 + 10	0.25 % L-bupi alebo 1 % Lido	10 + 10 + 5 (obturator nie)	

MAXIMÁLNE DÁVKY LOKÁLNYCH ANESTETIK					
BUPIVACAINE	2 mg / kg	3 mg / kg	0.5 % = 5 mg/ml, 0.25 % = 2.5 mg/ml		
LIDOCAINE	5 mg / kg	7 mg / kg	2 % = 20 mg/ml		

Výzvedlivky: CSA kontinuálna spinálna anestézia, ACL anterior cruciate ligament, CEA karotická endarterektómia, VATS video asistovaná torakoskopia, ISB interskalenický blok, ANB axilárny blok, AxB Axilárny blok, SCB supraklavikulárny blok, CPB cervical plexus blok, FICB fascia iliaca compartment blok, FENG pericapsular nerve blok, FNB femorálny blok, NCFL nervus cutaneus femoris lateralis, IPACK interspace between popliteal artery and capsule of the knee, ACB adduktor kanál blok, PB popliteálny blok, ICB interoscutaneálny nerv blok, TG temporoalý blok, SG subgluteálny blok, PS paravertebrálny blok, ONB obturator nerve blok, TAP transversus abdominis plane blok, NRB rectus sheath blok, QLB quadratus lumborum blok, LIA lokálna infiltratívna anestézia, ECI external oblique intercostal blok, PVB paravertebrálny blok, ESPB erector spinae plane blok, SPB serratus plane blok, PSB parasternal blok, GenV genikulárne vetvičky, AntCutV predná femorálna kĺbová vetvička, CPFB klavikulárna fascia, NSB nervus saphenous blok

Take Home Message

Think about **CPSP before surgery**

Think about **Prevention of CPSP**

Think about **of RA for surgery**

Think about **Multimodal analgesia**



Think Different



2016-2026

Blokujeme už 10 rokov s Vami



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NYSORA® 
Adapted for SKARA by Dr. Peter Merjavý

Nervové blokády hornej končatiny
Štandardizované techniky regionálnej anestézie NYSORA a SKARA 2026©

Pozícia ultrazvukovej sondy

Sonoanatómia

Reverzná sonoanatómia™

Anatómia

Interskalenický blok brachiálneho plexu

Indikácie: Anestézia a analgézia pri operáciách ramena, proximálneho humeru a distálnej kľúčnej kosti.
Poloha pacienta: V ľahu na chrbte, v polosedě; hlava otočená na kontralaterálnu stranu.
Sonda: Lineárna.
Hĺbka: 22G, 5 cm, krátky skosený hrot.
Objem LA: 7–15 mL.

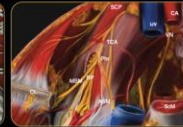
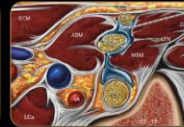
Abbreviations:
ASM Anterior scalene muscle
BP Brachial plexus
CA Carotid artery
CL Clavicle
C7-TP Transverse process of C7
DSN Dorsal scapular nerve
EJV External jugular vein
IJV Internal jugular vein
LA Local anesthetic
LCA Longus capitis muscle

LTN Long thoracic nerve
MSM Middle scalene muscle
PVR Phrenic nerve
RLN Recurrent laryngeal nerve
SCM Sternocleidomastoid muscle
SCP Superficial cervical plexus
TCA Transverse cervical artery
VA Vertebral artery
VC Vital capacity
VN Vagus nerve
LS Levator of the scapula



Počiatočné umiestnenie sondy: Transverzálna na krku, 2–3 cm proximálne od kľúčnej kosti, nad VJE (keď je viditeľná).

Ideálny obraz: Korene brachiálneho plexu (C5–C7) ako hypoechogénne okružité štruktúry medzi ASM a MSM.



Technika: Viesť ihlu v rovine sondy, latero-mediálnym smerom k plexu.
Ideálne rozšírenie LA:

Tipy:
• Doplnkové injekcie vykonávať len pri nedostatočnom šírení LA v interskalenickom priestore.
• Mieriť medzi korene C5/6 pričom hrot ihly umiestniť medzi plexus brachialis a MSM.

Nervové blokády hornej končatiny
Štandardizované techniky regionálnej anestézie NYSORA a SKARA 2026©

Pozícia ultrazvukovej sondy

Sonoanatómia

Reverzná sonoanatómia™

Anatómia

Interskalenický blok brachiálneho plexu

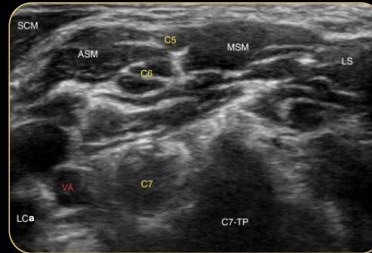
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Poloha pacienta: V ľahu na chrbte, v polosedě; hlava otočená na kontralaterálnu stranu.
Sonda: Lineárna.
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Objem LA: 7–15 mL.

Abbreviations:

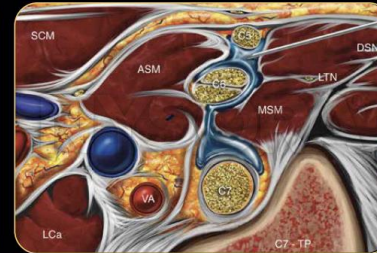
ASM Anterior scalene muscle
BP Brachial plexus
BPS Brachial plexus sheath
CA Carotid artery
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DSN Dorsal scapular nerve
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LCA Longus capitis muscle
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MSM Middle scalene muscle
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TCA Transverse cervical artery
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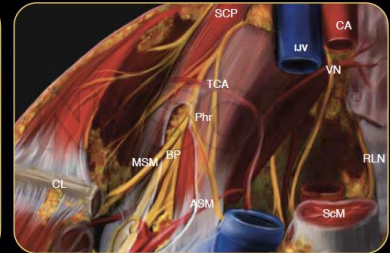
Počiatočné umiestnenie sondy: Transverzálna na krku, 2–3 cm proximálne od kľúčnej kosti, nad VJE (keď je viditeľná).
Hĺbka: 3 cm.



Ideálny obraz: Korene brachiálneho plexu (C5–C7) ako hypoechogénne okružité štruktúry medzi ASM a MSM.

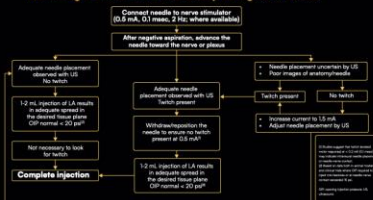


Technika: Viesť ihlu v rovine sondy, latero-mediálnym smerom k plexu.
Ideálne rozšírenie LA: Okolo truncus superior (C5, C6) a truncus inferior (C7) brachiálneho plexu v interskalenickom priestore medzi ASM a MSM.

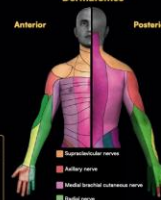


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• Doplnkové injekcie vykonávať len pri nedostatočnom šírení LA v interskalenickom priestore.
• Mieriť medzi korene C5/6 pričom hrot ihly umiestniť medzi plexus brachialis a MSM.
• Použiť farebný Doppler na vyhnutie sa cievam v trajektórii ihly.
• Vyhnúť sa dlhodobou pôsobiacim LA u pacientov, ktorí netolerujú > 20 % redukciu vitálnej kapacity (paréza nervus phrenicus).
• Truncus inferior (C8–T1) je zvyčajne vynechaný.

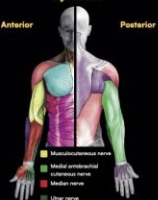
Monitoring of needle-nerve relationship during nerve blocks



Dermatomes



Myotomes



Osteotomes

