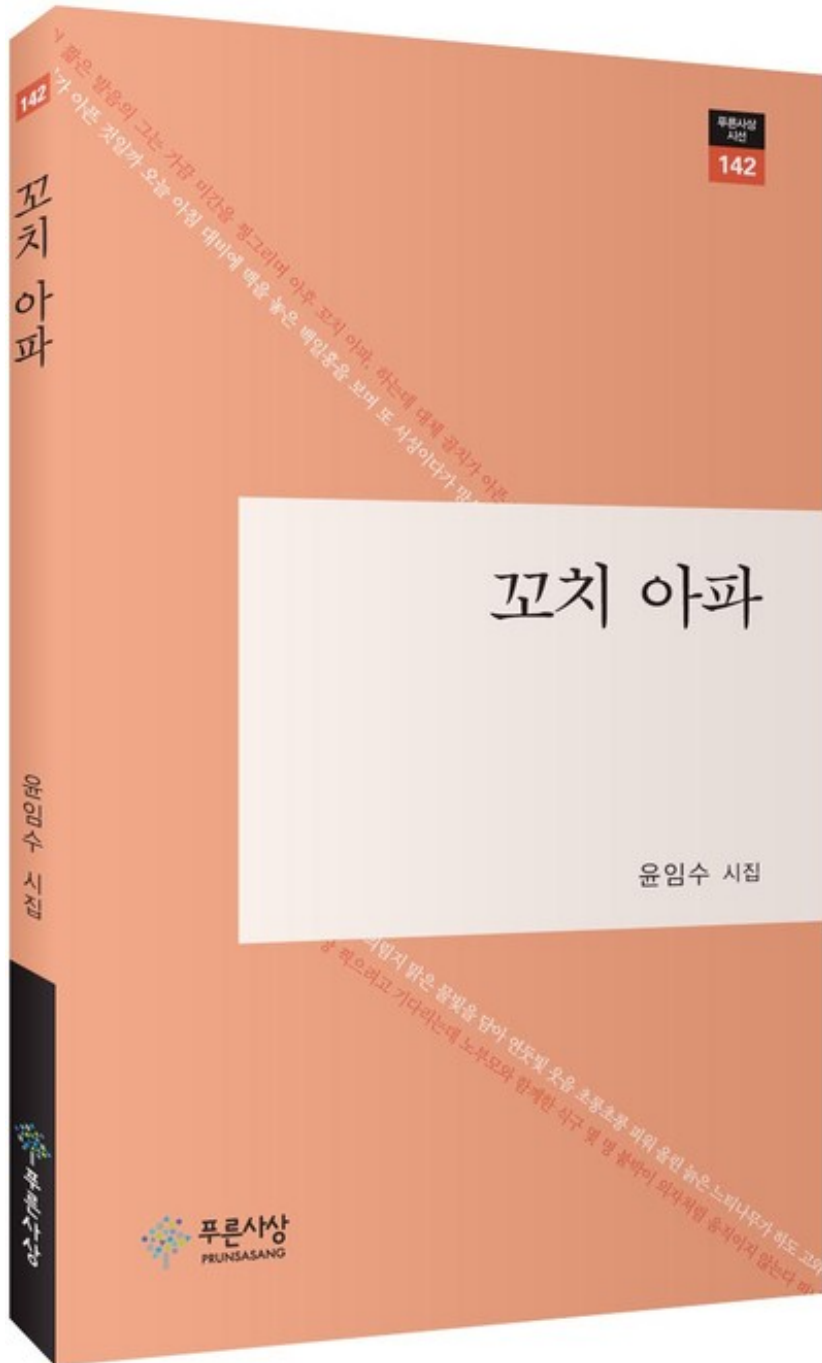


Pain Management and Opioid Use for common pediatric urology procedure

전남의대 마취통증의학과
이성현





혀 짧은 발음의 그는
가끔 미간을 찡그리며
아후 꼬치 아파, 하는데
대체
골치가 아픈 것일까
꼬치가 아픈 것일까

오늘 아침
장대비에 맥을 놓은 백일홍을 보며 또
아후 꼬치 아파, 하는데
백일홍은 골치도 없고 꼬치도 없으니
분명
꽃이 아픈 게 맞으렸다.



Pediatric urology procedure

- Nephrectomy
- Pyeloplasty
- Ureteral reimplant

- Orchiopexy
- Hydrocelectomy
- Hypospadias repair
- Circumcision
- Hernia repair
- Scrotoplasty

소아 환자의 통증 조절이 어려운 이유

- ✓ 울기만 함
- ✓ 불편한 점을 제대로 말하지 못함
- ✓ 통증 정도의 파악이 어려움



Numeric Rating Scale



Wong-Baker FACES® Pain Rating Scale



0

No
Hurt



2

Hurts
Little Bit



4

Hurts
Little More



6

Hurts
Even More



8

Hurts
Whole Lot



10

Hurts
Worst



FLACC pain scale

Interpreting the Behaviour Score

Each category is scored on the 0-2 scale, which results in a total score of 0-10.

0 relaxed and comfortable

4-6 moderate pain

1-3 mild discomfort

7-10 severe discomfort of pain or both

Categories	Score zero	Score one	Score two
F Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
L Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
A Activity	Lying quietly, normal position moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
C Cry	No crying (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
C Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Infant 부터 가능 (부모나 의료진이 행동 관찰)

Late postoperative period



Early postoperative period



Non-opioids vs. Opioids

In Operating Room

Regional block

under general anesthesia
or sedation

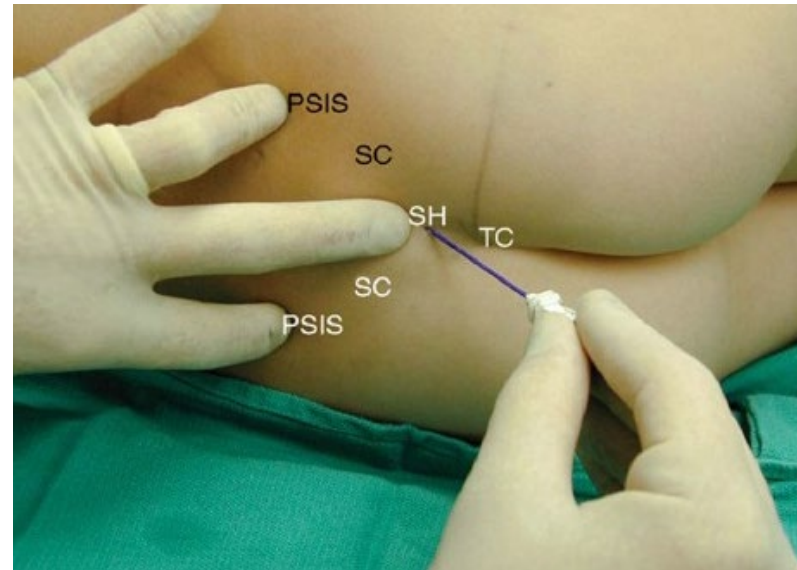
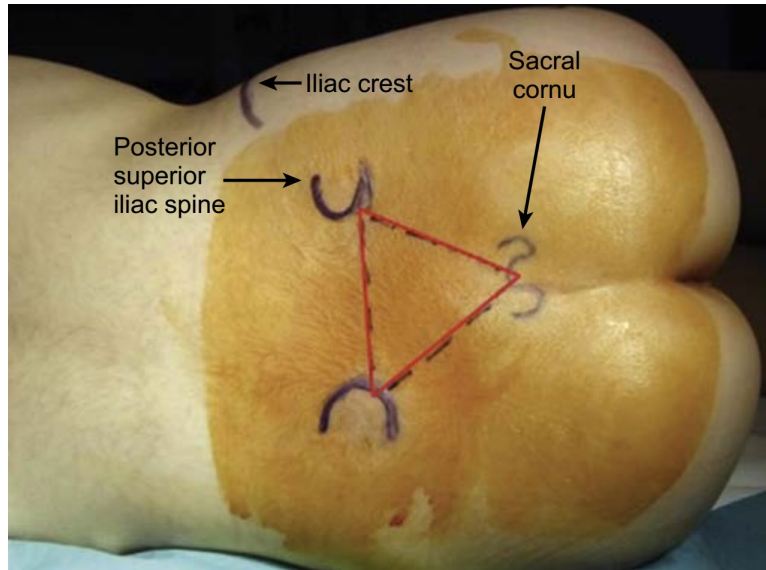


Most regional anesthesia techniques can be safely performed

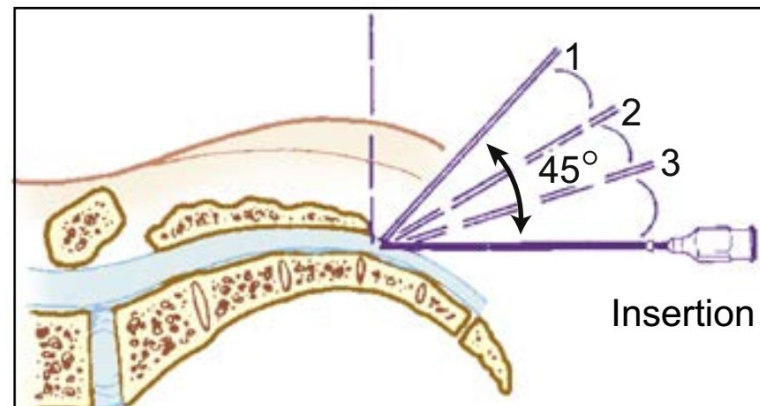
Strict attention to dose of the local anesthetic

Caudal block

- intraop & postop pain control



- ✓ Popular neuraxial blockade in children
- ✓ Simple and easy to perform
- ✓ Few complications



- **A single-shot technique**
- **Anatomical landmark or Ultrasound**
- **Occasionally, a catheter insertion for continuous infusion**

Opioids during **Anesthesia** / in the **ICU**

- ✓ Remifentanil
- ✓ Sufentanil
- ✓ Alfentanil



High potency

More respiratory depression

Not recommended for postoperative analgesia

JAMA Surgery | Review

Guidelines for Opioid Prescribing in Children and Adolescents
After Surgery
An Expert Panel Opinion

JAMA Surg. 2021;156(1):76-90

The first opioid-prescribing guidelines

to address the unique needs of children who require surgery

Table 1. Guidelines for Opioid Prescribing in Children and Adolescents After Surgery

Statement	Strength of recommendation ^a	LOE ^b	Grade of recommendation ^b	Grade of quality ^c
We recommend all health care professionals caring for children recognize that				
1. A significant proportion of adolescents with access to opioids misuse them.	****	1	A	High
2. Of adolescents who misuse prescription opioids, a significant number will develop dependence/opioid use disorder.	***	1	A	High
3. Adolescent opioid misuse is associated with heroin use.	****	1	B	Moderate
4. Prescriptions from a health care professional are the most common source of opioids for adolescents who misuse them.	****	1	A	High
5. A significant proportion of adolescents who are prescribed opioids divert them.	***	1	A	High
6. Adolescents who receive an opioid prescription after surgery may have a higher likelihood of future opioid prescriptions within the following year.	**	3	C	Low
7. The optimal postoperative regimen should balance adequate pain relief for recovery while minimizing adverse effects.	****	5	D	NA
8. Opioid-free postoperative analgesia is feasible for many pediatric operations. For most patients, we recommend an opioid-free recovery for the procedures in Table 4.	****	2	B	Moderate
9. Opioid-free postoperative analgesia may be possible for some patients after the procedures in Table 4.	****	2	C	Low
10. When discharge analgesics are deemed necessary, we recommend nonopioid option(s) as first-line treatment.	****	2	B	Moderate
11. We recommend perioperative enteral nonopioid analgesic use when clinically appropriate (Table 5).	****	2	B	Moderate
12. We recommend perioperative intravenous nonopioid medications as part of an opioid-sparing regimen.	****	2	B	Moderate
13. We recommend targeted use of perioperative regional or neuraxial anesthesia techniques as part of an opioid-sparing regimen. Effective communication between surgeons and anesthesiologists will ensure appropriate patient selection.	****	2	B	Moderate
14. We endorse the US Food and Drug Administration guidelines regarding limited use of codeine and tramadol for children younger than 18 y.	****	NA	NA	NA
15. We recommend that caregivers and children are educated about expectations and methods of pain management before the day of surgery and again perioperatively.	****	2	C	Low
16. We recommend consistent pain management messaging from all members of the perioperative care team.	****	2	B	Moderate
17. We recommend that pain management education is tailored to the caregiver's and child's needs to promote shared understanding and expectations.	****	5	D	NA
18. If opioids are prescribed, we recommend perioperative education should include instruction on possible adverse drug events, seriousness of adverse drug events, and what to do if those occur.	****	2	B	Moderate
19. We recommend educating caregivers and older children to store opioids in a secure location and properly dispose of unused medication.	****	3	C	Low
20. Health care entities caring for pediatric patients should consider providing infrastructure and means for safe opioid disposal.	****	5	D	NA

Recommendations

(1)~(6)

Opioid Misuse, Heroin Use, Diversion, and Conversion to Long-term Use (especially for adolescents)

(7)~(14)

Perioperative Nonopioid Regimens

(15)~(20)

Patient and Family Education

Perioperative Nonopioid Regimens

- (8,9) Opioid-free** postoperative analgesia is feasible **for many pediatric operations**, and may be possible for some patients after some procedures
- (11) enteral non-opioid analgesic** use when clinically appropriate
- (12) intravenous non-opioid** as part of an opioid-sparing regimen
- (13) targeted use of perioperative regional or neuraxial anesthesia techniques** as part of an opioid-sparing regimen
- (14) We endorse the US FDA guidelines regarding limited use of codeine and tramadol** for children **younger than 18 y**

Non-opioids (injection)



약물	Route	특이사항	국내연령금지
Diclofenac	IM	IV 사용시 <i>local venous thrombosis</i> 주의	4주 미만의 신생아, 미숙아
Ketorolac	IV	일반적인 NSAID 부작용 (acute kidney injury 가능성 포함)	2세 미만
Acetaminophen	IV	비급여	33kg 미만 소아 (약 11세 미만)

Propacetamol (데노간 주, 파세타 주): 소아금지

Opioids (IV injection)

Drugs	연령금기 및 특이사항
Fentanyl	2세 미만
Tramadol	12세 미만, US FDA black-box warning in children
Oxycodone	18세 미만
Meperidine (Pethidine)	Normeperidine (metabolite) may cause seizures

Tramadol & Codeine: US FDA black-box warning in children

- Reduced or slow breathing
- 12세 미만 금기
- 18세 미만 금기: 비만, 수면무호흡, 폐질환 등

안전하고 효과적인 opioid 주입법

- IV-PCA

- Fentanyl
- Morphine



	Size of bolus	Lockout interval (min)	Continuous infusion
Morphine	0.01-0.03 mg/kg (max, 0.15 mg/kg/h)	5-10	0.01-0.03 mg/kg/h
Fentanyl	0.5-1ug/kg (max	5-10	0.5-1ug/kg/h

Summary (**Opioids** & non-opioids)

연령기준(국내)					
신생아	Morphine				
4주 이후		Diclofenac			
2세 이상			Fentanyl Ketorolac		
11세 이상 (33kg 이상)				Acetaminophen (비급여)	
12세 이상					Tramadol

Morphine: 신생아에서 clearance 낮기 때문에 respiratory depression 더 잘 발생할 수 있음

**Thank you
for listening**

