

## SUPPLEMENTARY MATERIAL

Table 1. Study questionnaire

DEMOGRAPHIC DATA
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1. Sex:      male ☐                      female ☐
2. Place of work: a) Public hospital ☐   b) Private hospital ☐
3. Medical speciality/subspecialty:    α) Neonatologist ☐   β) Trainee neonatologists ☐   γ) Pediatrician working in a NICU ☐
4. Years of working in the NICU: .....

Physician's perceptions
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5. Do you believe that neonates are capable of feeling pain?  
     YES ☐                      NO ☐
6. Do you believe that pain may have adverse effects in the neonate?  
     YES ☐                      NO ☐
7. Is there a protocol for sedation and analgesia in your department?  
     YES ☐                      NO ☐
8. Regardless of the NICU policy, you consider the administration of sedation-analgesia to neonates undergoing painful/stressful procedures as:  
     a) necessary ☐      b) important ☐      c) not needed ☐

Physician's practices
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- 9.A. Do you use analgesia in neonates following major surgeries?  
     YES ☐                      NO ☐
- 9.B. If yes, which analgesic?  
     a) morphine ☐                      c) meperidine (pethidine) ☐  
     b) fentanyl ☐                      d) paracetamol ☐  
     ε) other (define) .....
- 10.A. Do you use sedation – analgesia to neonates receiving mechanical ventilation :  
     a) never ☐      β) in special occasions ☐      c) often ☐      d) always ☐  
     If the answer is the (b), please identify the special cases: .....  
     .....
- 10.B. If you use medication during mechanical ventilation, which of the following do you use?  
     a) morphine ☐                      e) diazepam ☐  
     b) fentanyl ☐                      f) phenobarbital ☐  
     c) midazolam ☐                      g) chloral hydrate ☐  
     d) lorazepam ☐                      h) other (define) .....
11. If you use medication postoperatively or during mechanical ventilation, which way of administration do you prefer?  
     a) standard intervals ☐  
     b) continuous infusion ☐  
     c) on demand ☐

12.A. Do you administer muscle relaxants during mechanical ventilation?

- a) never ☐ b) rarely ☐ c) often ☐ d) always ☐

12.B. If yes, which muscle relaxant do you use?

- a) pancuronium (Pavulon) ☐ c) vecuronium (Norcuron) ☐  
b) atracurium (Tracrium) ☐ d) other (define) .....

12.C. If you administer muscle relaxant to neonates on mechanical ventilation:

- a) do you use a sedative and/or analgesic along with the muscle relaxant? ☐  
b) do you believe that there is no need of sedative and/or analgesic use with muscle relaxant? ☐

13.A. Do you use a sedative or analgesic prior to non-emergent intubation? YES ☐ NO ☐

13.B. If yes, which of the following?

- a) morphine ☐ f) diazepam ☐  
b) fentanyl ☐ g) phenobarbital ☐  
c) paracetamol ☐ h) chloral hydrate ☐  
d) midazolam ☐ i) other (define) .....  
e) Ketamine ☐

13.C. Do you use a muscle relaxant prior to non-emergent intubation? YES ☐ NO ☐

13.D. If yes, which relaxant?

- a) pancuronium (Pavulon) ☐ c) vecuronium (Norcuron) ☐  
b) atracurium (Tracrium) ☐ d) other (define) .....

14.A. Do you use systemic analgesia/sedation during chest drainage?.

YES ☐ NO ☐

14.B. If yes, which of the following?

- a) morphine ☐ e) midazolam ☐  
b) fentanyl ☐ f) diazepam ☐  
c) paracetamol ☐ g) phenobarbital ☐  
d) chloral hydrate ☐ h) sedation ☐  
i) other (define) .....

15. Do you use systemic analgesia/sedation or local anesthesia prior to or during the following painful procedures? If yes, please define.

- a) Lumbar puncture: YES ☐ (define ..... ) NO ☐  
b) Peripheral arterial line placement: YES ☐ (define ..... ) NO ☐  
c) Endotracheal suction: YES ☐ (define ..... ) NO ☐  
d) Chest tube placement: YES ☐ (define ..... ) NO ☐  
e) Suprapubic paracentesis: YES ☐ (define ..... ) NO ☐  
f) Venous puncture: YES ☐ (define ..... ) NO ☐  
g) Heel prick: YES ☐ (define ..... ) NO ☐  
h) Other procedures (define ..... )

16.A. Do you use non-pharmacological means to alleviate pain and discomfort prior to or during minor painful or stressful procedures?

YES ☐ NO ☐

16.B. If yes, which of the following non-pharmacological means do you use?

- a) minimization of procedures and handling of the neonates ☐  
b) decrease of the light and noise in the NICU ☐  
c) tactile stimulation ☐  
d) skin to skin contact ☐  
e) use of non-nutritive sucking (pacifier) ☐  
f) sweet solutions orally ☐  
g) other (define) .....

17.A. Do you use neonatal pain assessment tools? YES ☐ NO ☐

17.B. If yes, who performs the assessment? doctor ☐ nurse ☐

17.C. If yes, please indicate which of the following neonatal pain assessment scales you use:

- a) NIPS (Neonatal Infant Pain Scale) ☐
- b) PIPP (Premature Infant Pain Profile) ☐
- c) COMFORT ☐
- d) N-PASS (Neonatal Pain Agitation & Sedation Scale) ☐
- e) EDIN (Echelle Douleur Inconfort Nouveau-Ne) ☐
- f) DAN (Douleur Algu du Nouveau-Ne) ☐
- g) CRIES (Cry, Requires oxygen, Increased vital signs, Expressions, Sleeplessness) ☐
- h) NFCS (Neonatal Facial Coding System) ☐
- i) other (define) .....

Educational sources & respondent's suggestions
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18. If your view is that neonates need sedation-analgesia, which sources of information contributed to this end.

- a) International literature ☐
- b) Greek literature ☐
- c) Lectures at international congresses ☐
- d) Lectures at Greek congresses ☐
- e) Lectures in the NICU ☐
- f) Discussions during daily ward rounds ☐
- g) other (define).....

19.A. Do you think that further education of Greek neonatologists on neonatal pain management is required?

YES ☐, NO ☐

19.B. If yes, what would you suggest? .....

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Further comments
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Supplementary Table 2. Independent association of the time-point with the use of analgesia – sedation and non-pharmacological measures for neonatal pain, after adjustment for physicians' sex and working years in neonatal intensive care unit.

Dependent variables	Independent variables <sup>a</sup>	p	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
A-S post-operationally	T-P	0.137	5.431	0.584	50.536
A-S during MV	T-P	0.006	0.159	0.043	0.590
A-S for non-emergent intubation	T-P	0.053	0.511	0.258	1.010
A-S for other procedures	T-P	0.030	0.377	0.156	0.910
Local anesthetics	T-P	0.000	0.062	0.030	0.129
Non-pharmacological approaches	T-P	0.006	6.091	1.659	22.361
Sweet solutions	T-P	0.000	9.353	4.707	18.583

<sup>a</sup> The physicians' sex and working years in NICU were not significantly associated with any dependent variable; A-S, analgesics – sedatives; MV, mechanical ventilation; NICU, neonatal intensive care unit; T-P, time-point

Supplementary Table 3. Factors independently associated with the use of analgesia – sedation during mechanical ventilation. The time-point, physicians' sex, and working years in neonatal intensive care unit entered the model as independent variables.

Dependent variables	Independent variables <sup>a</sup>	p	Exp(B)	95% CI for Exp(B)	
				Lower	Upper
Opioids	T-P	0.000	5.727	2.389	13.727
	Years in NICU	0.042	1.057	1.002	1.115
<i>Morphine</i>	T-P	0.154	0.603	0.301	1.208
	Sex	0.031	2.231	1.075	4.632
<i>Fentanyl</i>	T-P	0.000	10.291	4.881	21.696
Paracetamol	T-P	0.001	2.887	1.570	5.307
General anesthetics	T-P	0.020	6.131	1.333	28.192
Sedation	T-P	0.021	2.015	1.111	3.653
<i>Midazolam</i>	T-P	0.000	4.570	2.368	8.821
	Years in NICU	0.019	1.048	1.008	1.089
<i>Diazepam</i>	T-P	0.340	0.587	0.196	1.754
	sex	0.026	3.448	1.156	10.279
<i>Phenobarbital</i>	T-P	0.047	8.348	1.033	67.443

<sup>a</sup> only T-P and significant independent variables are shown. A-S, analgesics – sedatives; NICU, neonatal intensive care unit; T-P, time-point