

NOL Intraoperative Medication Guide

Notes to user: This educational tool is intended for use by field personnel clinically supporting NOL monitoring and should not be shared with clinicians. This tool is not intended to replace clinical judgement and may be updated from time to time. The content is clinically relevant to adult patients only. Anaesthetic medications may impact both BIS and NOL values. When a medication is given, the NOL values may change rapidly in a pronounced manner. After a typical period of two minutes, the displayed NOL baseline will reflect the effect of the medication and the NOL values will change in response to new noxious stimuli. This document has been reviewed by trained anaesthesiologists.

Class	Drug	Brand Name	Dosing & Duration	Cardiovascular Effect	BIS Effect	Typical NOL Effect	
Sedatives	Midazolam	Versed	50-350 µg/kg; 15-80 min	HR ↓ BP ↔	May potentiate the effects of other hypnotics	↔ (no change) during maintenance period	
Hypnotics/ Induction Agents	Propofol	Diprivan	1.5-2.5 mg/kg; 5-10 min	↓ HR ↓ BP	↓	↓ (reduce) Lower NOL baseline established. NOL will increase in response to noxious stimuli	
	Etomidate	Amidate	0.3 mg/kg ;7 min	↔		↔	
Inhaled Anaesthetics measure by the minimum alveolar concentration at which 50% of patients do not move in response to a noxious stimulus	Sevoflurane	Sevo	2% (= MAC in adults)	↓ HR ↓ BP	↓	↓ Lower NOL baseline established. NOL will increase in response to noxious stimuli at equipotent MAC doses	
	Desflurane	Des	6% (= MAC in adults)				
	Isoflurane	Iso	1.2% (= MAC in adults)				
	Nitrous Oxide	NO	105% (=MAC in adults)	BP ↔	↔		
Opioid Analgesics	Remifentanyl	Ultiva	0.05-2 µg.kg ⁻¹ .min ⁻¹ ; 5-10 min	↓ HR ↓ BP	↔	↓ (Remifentanyl is ultra-short acting and elicits fastest changes in NOL) Lower NOL baseline established. Reduced NOL response to noxious stimuli.	
	Alfentanyl	Rapifen, Alfenta	50-300 ug/kg; 10-15 min	Respiratory depression Hypotension, Bradycardia			
	Short-Acting	Sufentanyl	Sufenta	0.5-1 ug/kg; 20-45 min			↓ HR ↓ BP
		Fentanyl	Duragesic	1-2 ug/kg; 30-60 min			May cause hypotension
Long-Acting	Hydromorphone	Dilaudid	0.5-2 mg; 2-4h	↓ HR ↓ BP			
	Morphine (usually given towards end of surgery)	Avinza	2.5-15 mg; 4-6h	BP ↓ HR ↔ Respiratory depression Hypotension			

Class	Drug	Brand Name	Dosing & Duration	Cardiovascular Effect	BIS Effect	Typical NOL Effect
Opioid Free Analgesics	Ketamine (also used as sedative & IV induction agent)	Ketalar	bolus 1mg/kg; 5-20 min	↓ HR ↓ BP Modest effect	↑ (increase)	↓ Decrease NOL values
	Dexmedetomidine (also used as IV induction agent)	Precedex	continuous infusion of 0.2-0.8 ug/ kg/h; 1-2 h		↓	
	Lidocaine IV	Xylocaine	1.5-2mg/kg; 10-20 min	HR ↓ BP ↓ Respiratory depression Hypotension, Bradycardia	Irregular	
	Clonidine	Catapres	2-4 ug/kg/ hour;	HR ↓ BP ↓		↓ Lower NOL baseline established.
Muscle Relaxants	Succinylcholine	Suxamethonium	0.3-1.1 mg/kg; 4-6 min	Respiratory depression Hypotension	↔	↔
	Rocuronium	Zemuron	0.45-0.6 mg/kg; 30 min	HR ↑ BP ↑		
Vasopressor	Phenylephrine	Neo-Synephrine	50-100 ug; 15-20 min	HR ↔ BP ↑	↔	↑ May transiently increase NOL values
	Ephedrine	Akovaz	1 mg; 10-60 min	HR ↑ BP ↑	↑	
Anti-hypertensive	Labetalol	Trandate	0.25 mg/kg; 2-4 h	HR ↓ BP ↓	↔	↓ may transiently decrease NOL values
	Esmolol	Brevibloc	0.5-1 mg/kg that may be repeated; <12 h; 10-20 min			