



Intraoperative Neuromonitoring questionnaire

Questions Types	
 Mandatory information 	Multiple answers allowed
O Only one answer allowed	please specify

PRELIMINARY DATA

Neuromonitoring date *	Neuromonitoring specified as *:
dd/mm/yyyy	O Surgeon only used hand-held or automated device
	O In-room neuromonitorist independently recorded tests
	O In-room neuromonitorist independently recorded tests and
	Surgeon also used hand-held or automated device

Institution/Hospital

Operating rooms *	University affiliated *	Neurosurgery and/or orthopedic spine fellowship *
O < 10 operating rooms	O Yes	O Yes
O 10 − 20 operating rooms	O No	O No
O 21 – 30 operating rooms		
O 30 operating rooms		

Model of Care

Model of Care *:	
O PhD neurophysiologist in operating room throughout case	O PhD neurophysiologist not routinely in operating room but
O MD neurophysiologist in operating room throughout case	personally and immediately available
O Technologist or physiologist in room throughout case, in room	O Technologist or physiologist reporting directly to surgeon; no PhD
PhD neurophysiologist part of case	or MD neurophysiologist availability
O Technologist or physiologist in room throughout case, in room	O Technologist or physiologist reporting to out of hospital/online
MD neurophysiologist part of case	MD supervising neurophysiologist
O MD neurophysiologist not routinely in operating room but	O Technologist or physiologist reporting to out of hospital/online
personally and immediately available	PhD supervising neurophysiologist

PhD supervising neurophysiologist O Surgeon driven (or automated) neuromonitoring only

Planned maintenance anesthetic *:			
 Primarily inhaled agent 	 O Intravenous supplemented by inhaled agent 	O Total intravenous anesthesia	O Unknown

Pre-op limb and/o	or walking neurological deficit *:
O Yes	O No
If YES,	
Sensory deficit	
O Yes	O No if YES: Done upper limb Doth upper limbs Done lower limb Doth lower limbs
Motor deficit	
O Yes	O No
	if YES:
	🗆 one upper limb
	🗆 both upper limb
	🗆 one lower limb

	□ both lower limbs	
Walking deficit O Yes	if YES: Cannot walk Can walk with appliance and/or assistance Can walk with fair or poor coordination or limp	O No

High-risk findings on pre-op imaging:	
□ None	□ Coronal or sagittal plane Cobb measurement ≥ 80°
 "Severe" (absolute/critical) stenosis at spinal cord and/or cauda equina level T2 MRI intramedullary signal at operated spinal cord 	Other high risk finding (Specify)
level	Unknown

MEP and SEP data

MEP monitored *				
O Yes	O No			
If YES:	If NO,:			
Total intravenous anesthesia used during MEP acquisition * O Yes O No Partial or complete neuromuscular blockade used during critical MEP acquisition * O Yes O No	 O Not attempted because not indicated ONot attempted because of patient factors O Not attempted because not ordered or declined by surgeon O Attempted but MEPs not recordable 			
When first MEP recorded timing				
O Before and after O After positioning O After incision or positioning but before incision later in case				
Further optimized anesthesia and/or blood pressure management requested O Yes O No				
If YES, further optimized anesthesia implemented O Yes O No				
Before crucial surgical actions. MEPs recorded from all limbs/myotomes at ris	sk			
O Yes	O No			
if YES	if NO were the non-elicitable MEPs from weak limb(s)?			
OOptimal MEPs (>OAcceptable MEPsOSuboptimal MEPs100 μV and good(< 100 μV but good	O Yes O No			

From the end of exposure to the beginning of closure, please select the best overall estimate of the number of MEP trials per hour. Concurrent left and right body recordings = one trial:

Estimated Bilateral MEP Freque	ncv *		
O 6 or more bilateral MEPs per hour	O 4-5 bilateral MEPs per hour	O 1-3 bilateral MEPs per hour	O Less than 1 bilateral MEPs per hour

Upper SEPs

Upper SEPs were monitored			
O Yes		O No	
if YES,			
Recorded before and after po O Yes O No	ositioning		
Trial to trial reproducibility BEFORE crucial surgical actions			
O Excellent O Good	O Fair	O Poor	

Lower SEPs

Lower SEPs were	Lower SEPs were monitored			
O Yes				O No
if YES,				
Recorded before O Yes O	and after posit i No	oning		
Trial to trial reproducibility BEFORE crucial surgical actions				
O Excellent	O Good	O Fair	O Poor	

Warning Criterion (WC)

Major MEP WC Definition: spinal cord *								
O at least 50% amplitude decrease	O at least 65% amplitude decrease	O at least 80% amplitude decrease	 O Disappearance (100% loss) 	O Other				
If other, please specify:								
Major MEP WC Definition:	root, plexus *							
O at least 50% amplitude decrease	O at least 65% amplitude decrease	O at least 80% amplitude decrease	O Disappearance (100% loss)	O Other				
If other, please specify:								

MEP ALARM(S): CONTECT, ACTION, RECOVERY

Warning Criterion (WC) met	?* (Alarm occuri	red)			
O Yes	O No				
If YES, Was the alarm anesth O Yes	nesia and/or tec O No	hnically related *			
If YES, add another alarm? (up to 3 alarms reportable) O Yes O No (If yes, report as another alarm below)	If NO, Surgeon inform O Yes	med and acknowledged ○ No If No, ○ Surgeon deferred r acknowledgment	* response or delayed	O Not sure surgeon he understood alarm	eard or
		MEP WC: limbs affected one upper limb	d * □ both upper limbs	□ one lower limb	both lower limbs
		Surgical context O Positioning body; head/neck; upper/lower limb	O Surgeon action/maneuver	O Inadequate blood pressure, perfusion, and/or oxygenation	O Unknown or Other
		Intervention *	Adjusted or reversed surgeon action	Re-positioned	Corrected blood pressure, perfusion and/or oxygenation
		Surgical pause	□ Aborted surgery	□ Wake up test	

Complete or partial MEP recovery before sur	gery end *
O Yes	O No
If YES,	
 Complete (all affected MEPs no longer met WC) 	 Partial (improvement but one or more MEPs still meet WC)
Add another alarm? * (up to 3 alarms reporta	ble)
O Yes	O No
(If yes, report as another alarm below)	

Alarm 2

Warning Criterion (WC) met?* (Alarm occurred)							
O Yes	O No						
If YES. Was the alarm anest	nesia and/or te	chnically related *					
O Yes	O No						
If YES, add another alarm? (up to 3 alarms reportable) O Yes O No (If yes, report as another alarm below)	If NO, Surgeon info OYes	rmed and acknowledge O No	d *				
		If No, O Surgeon deferred response or delayed acknowledgment			O Not sure surgeon heard or understood alarm		
		MEP WC: limbs affect	ed *				
		one upper limb		both upper limbs	□ one lower limb		both lower limbs
		Surgical context * O Positioning body; head/neck; upper/lower limb	0 9	Surgeon action/maneuver	O Inadequate blood pressure, perfusion, and/or oxygenation	C	D Unknown or Other
		Intervention *		Adjusted or reversed surgeon action	Re-positioned		Corrected blood pressure, perfusion and/or
		Surgical pause		Aborted surgery	□ Wake up test		oxygenation
		Complete or partial N	/IEP rec	overy before surge	ery end *		
		O Yes		, ,	O No		
		If YES, O Complete (all affected MEPs no longer met WC)		 Partial (improvement but one or more MEPs still meet WC) 		out one or more	
Add another alarm? * (up to 3 alarms reportable) O Yes (If yes, report as another alarm below)							

Warning Criterion (WC) met	?* (Alarm occu	rred)	
O Yes	O No		
If YES, Was the alarm anesth	esia and/or te	chnically related *	
O Yes	O No		
If YES, add another alarm?	If NO,		
(up to 3 alarms reportable)	Surgeon info	rmed and acknowledged *	
O Yes O No	O Yes	O No	
(If yes, report as another		If No,	
		 O Surgeon deferred response or delayed acknowledgment 	 Not sure surgeon heard or understood alarm
		MEP WC: limbs affected * (multiple answers all	lowed)
		one upper	□ one lower □ both lower
		limb limbs	limb limbs

Surgical context * O Positioning body; head/neck; upper/lower limb	O Surgeon action/maneuver	O Inadequate blood pressure, perfusion, and/or oxygenation	O Unknown or Other
Intervention *			
None	 Adjusted or reversed surgeon action 	□ Re-positioned	 Corrected blood pressure, perfusion and/or oxygenation
Surgical pause	□ Aborted surgery	□ Wake up test	10
Complete or partial N	AEP recovery before surge	ery end *	
O Yes		O No	
If YES,			
O Complete (all affected MEPs no longer met WC)		 Partial (improvement but one or more MEPs still meet WC) 	

WARNING CRITERION WC

Major SEP WC Definition *			
O at least 50% amplitude decrease	0	amplitude reduction from recent pre-change values exceeding variability	O Other
If other, please specify:			

SEP ALARM(S): CONTEXT, ACTION, RECOVERY

Warning Criterion (WC) met	?* (Alarm occurr	ed)			
O Yes	O No				
If YES, Was the alarm anesth O Yes	esia and/or tech O No	nnically related *			
If YES, add another alarm? If (up to 3 alarms reportable) S O Yes O No ((If yes, report as another	If NO, Surgeon inform O Yes	ned and acknowledged 그 No If No,	*		
		O Surgeon deferred acknowledgment	response or delayed	O Not sure surgeon he understood alarm	eard or
		SEP WC: limbs affected	*		
		one upper limb	both upper limbs	□ one lower limb	both lower limbs
		Surgical context			
		 Positioning body; head/neck; upper/lower limb 	O Surgeon action/maneuver	O Inadequate blood pressure, perfusion, and/or oxygenation	O Unknown or Other
		Intervention *			
		□ None	 Adjusted or reversed surgeon action 	□ Re-positioned	 Corrected blood pressure, perfusion and/or oxygenation
		Surgical pause	Aborted surgery	□ Wake up test	0.190.00001
		Complete or partial SE	P recovery before surger	ry end *	
		O Yes	-	O No	
					V1.0 – 20 May 202

Add another alarm? * (up to 3 alarms reportable) O Yes O No	If YES, O Complete (all affected SEPs no longer met WC)	O Partial (improvement but one or more SEPs still meet WC)
O Yes O No	Add another alarm? * (up to 3 alarms reporta	ble)
	O Yes	O No
(If yes, report as another alarm below)	(If yes, report as another alarm below)	

Alarm 2

Warning Criterion (WC) met	?* (Alarm occu	rred)			
O Yes	O No				
If YES, Was the alarm anest	nesia and/or te	chnically related *			
If VES add another alarm?					
(up to 3 alarms reportable)	Surgeon info	rmed and acknowledged	*		
O Yes O No	O Yes	O No			
(If yes, report as another alarm below)		If No,			
		O Surgeon deferred response or delayed acknowledgment		layed O Not sure surgeon understood alarm	heard or
		SEP WC: limbs affected	3 *		
		one upper limb	both upp limbs	er 🗆 one lower limb	both lower limbs
		Surgical context *			
		O Positioning body; head/neck:	O Surgeon action/ma	O Inadequate blood ineuver pressure, perfusion. and/or	d O Unknown or Other
		upper/lower limb		oxygenation	
		Intervention *			
		□ None	Adjusted reversed surgeon a	or 🗆 Re-positioned	Corrected blood pressure, perfusion and/or
		Surgical pause	□ Aborted s	surgery 🛛 Wake up test	onyBenation
		Complete or partial SE	P recovery befo	ore surgery end *	
		O Yes		O No	
		If YES,			
O Complete (all affected SEPs no longer O Partial (improvement but o met WC) SEPs still meet WC)				ment but one or more VC)	
		Add another alarm? *	(up to 3 alarms	reportable)	
		○ Yes (If yes, report as anot	her alarm below	0 No v)	

Warning Criterion (WC) met	?* (Alarm occu	rred)					
O Yes	O No						
If YES, Was the alarm anesth O Yes	esia and/or te O No	chnically related *					
If YES, add another alarm?	If NO,						
(up to 3 alarms reportable)	Surgeon info	rmed and acknowledged	*				
O Yes O No	O Yes	O No					
(If yes, report as another alarm helow)		If No,					
		 Surgeon deferred response or delayed acknowledgment 		O Not sure surgeon h understood alarm	eard	or	
		SEP WC: limbs affected	d *				
		one upper limb		both upper limbs	□ one lower limb		both lower limbs
		Surgical context *					
		O Positioning	0	Surgeon	O Inadequate blood	C) Unknown or
		body;		action/maneuver	pressure,		Other

	head/neck; upper/lower limb		perfusion, and/or oxygenation	
Inte	ervention *			
	□ None	 Adjusted or reversed surgeon action 	□ Re-positioned I	 Corrected blood pressure, perfusion and/or oxygenation
I	Surgical pause	□ Aborted surgery	Wake up test	
Cor	nplete or partial SE	P recovery before surger	y end *	
C	Yes		O No	
If YE	ES,			
С	Complete (all affe met WC)	cted SEPs no longer	 O Partial (improvement SEPs still meet WC) 	it but one or more

CO-DIAGNOSTICS

2 dimensional (Conventional C-arm)	3 dimensional (Isocentric C-arm, O-arm, intraoperative CT, or navigation)	Robot guided screw implantation or other surgical maneuver	Surgeon directed/driven hand-held and/or automated neuromonitoring device	Stagnara (wake-up) test
O Yes	O Yes	O Yes	O Yes	O Yes
O No	O No	O No	O No	O No