

**Supplement 1.** Questionnaire for the intraoperative neurophysiological monitoring web survey

Questionnaire	Category
Demographic	
How many years of experience do you have using IONM?	0-5 6-10 11-15 16-19 ≥20
How many annual spine surgeries were conducted at your primary working place?	1-50 51-100 101-200 201-300 301-400 401-1,000 >1,000
How many years of experience do you have performing spine surgery?	0-5 6-10 11-15 16-19 ≥20
How many spine surgeons work at your institution?	1-2 3-4 5-9 ≥10
Which institution(s) do you belong to? (You may select multiple options.)	Public hospital Public university hospital Private hospital Private university hospital Others (free description)
Which country do you practice in?	Australia Bangladesh China Hong Kong India Indonesia Japan Kazakhstan Korea Malaysia Myanmar Nepal New Zealand Pakistan Philippine Singapore

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Questionnaire	Category
Which country do you practice in?	Sri Lanka Taiwan Thailand Turkey Vietnam Others (free description)
Does your institution use IONM for spine surgeries?	We do not use IONM for spine surgery at all Less than half of spine surgeries use IONM More than of half spine surgeries use IONM All spine surgeries use IONM Others (free description)
Which type of IONM modality is utilized at your institution? (You may select more than one option.)	Tc-MEP SEP Spontaneous EMG Sp-SCEP D-wave Triggered EMG Others (free description)
Tc-MEP implementation status	
Who is responsible for setting up the IONM system prior to spine surgeries at your institution? (You may select more than one option.)	Orthopedic surgeon Anesthesiologist Neurologist Nurse Medical technologists Clinical engineers Others (free description)
Who manages IONM, especially in Tc-MEP, during spine surgeries at your institution? (You may select more than one option.)	Orthopedic surgeon Anesthesiologist Neurologist Nurse Medical technologists Clinical engineers Others (free description)
Who evaluates alarm points on IONM, especially in Tc-MEP, during spine surgeries at your institution? (You may select more than one option.)	Orthopedic surgeon Anesthesiologist Neurologist Nurse Medical technologists Clinical engineers Others (free description)

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Questionnaire	Category
What is the alarm point utilized for Tc-MEP compared to baseline wave amplitude?	>50% reduction
	>70% reduction
	Alarm point changes according to the type of surgery
	Unknown
	Others (free description)
Can you please specify the number of channels utilized in Tc-MEP?	≥16
	8–14
	4
	Unknown
	Others (free description)
Have you ever experienced any complications related to Tc-MEP?	Yes
	No
Have you experienced any complications related to Tc-MEP? (You may select more than one option.)	Buccal mucosa injuries
	Tongue injuries
	Tooth injury
	Epileptic seizures
	None
Others (free description)	
Can you provide a list of countermeasures to prevent any complications related to Tc-MEP? (You may select more than one option.)	Minimize the intensity and frequency of transcranial stimulation
	Fill the oral cavity with gauze
	Fill the oral cavity with hard bite block
	Avoid using IONM for patients with a history of epilepsy
	Others (free description)
Do you pre-determine the management of alarm points for Tc-MEP?	Yes, I determined the management in advance.
	No, I do not determine the management in advance.
	Unknown
	Others (free description)
Do you use the wake-up test when Tc-MEP cannot recover enough during surgery?	Yes
	No
	No experience of such situation
	Others (free description)
How do you manage spine surgery in cases with inadequate wave amplitudes (less than 50 μV) on Tc-MEP before surgery?	To achieve sufficient wave amplitude in at least one electrode, consider changing either the monitored muscles or the electrode position.
	Proceed with the surgery without Tc-MEP
	Add SEP or other modality and proceed with the surgery
	Postpone the surgery
	Unknown
	Others (free description)

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Supplement 1. Continued

Questionnaire	Category
Awareness survey regarding necessity of IONM for several spine surgeries	
Does corrective surgery for ASD require (IONM)?	Yes
	No
	I do not do ASD surgery at all.
Which IONM modality should be used for the correction surgery for ASD? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Others (free description)	
Does correction surgery for scoliosis (adolescent or syndromic or congenital) require IONM?	Yes
	No
	I do not do scoliosis surgery at all.
Which IONM modality should be used for correction surgery for scoliosis (adolescent or syndromic or congenital)? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Others (free description)	
Does correction surgery for kyphosis (cervical or thoracic or thoracolumbar) require IONM?	Yes
	No
	I do not do scoliosis surgery at all.
Which IONM modality should be used for kyphosis correction? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Others (free description)	
Does correction surgery for growing rod insertion require IONM?	Yes
	No
	I do not do scoliosis surgery at all.
Which IONM modality should be used for growing rod? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Others (free description)	
Does decompression surgery for cervical OPLL require IONM?	Yes
	No
	I do not do cervical OPLL surgery at all.

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## Supplement 1. Continued

Questionnaire	Category
Which IONM modality should be used for decompression surgery for cervical OPLL? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does decompression surgery for CSM require IONM?	Yes
	No
	I do not do CSM surgery at all.
Which IONM modality should be used for decompression surgery for CSM? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does the decompression and fusion surgery for thoracic OPLL require IONM?	Yes
	No
	I do not do thoracic OPLL surgery at all.
Which IONM modality should be used for decompression and fusion surgery for thoracic OPLL? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does the decompression and fusion surgery for thoracic OYL require IONM?	Yes
	No
	I do not do thoracic OYL surgery at all.
Which IONM modality should be used for decompression and fusion surgery for thoracic OYL? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does the decompression surgery with fusion for low-grade spondylolisthesis require IONM?	Yes
	No
	I do not do fusion surgery for low-grade spondylolisthesis at all.
Which IONM modality should be used for decompression surgery for IMSCT? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does decompression surgery with fusion for high-grade spondylolisthesis require IONM?	Yes
	No
	I do not do fusion surgery for high-grade spondylolisthesis at all.
Which IONM modality should be used for resection surgery for IMSCT? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does the resection surgery for cauda equina tumors require IONM?	Yes
	No
	I do not do cauda equina tumor surgery at all.
Which IONM modality should be used for resection surgery for cauda equina tumors? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)
Does decompression surgery for LSS require IONM?	Yes
	No
	I do not do LSS surgery at all.
Which IONM modality should be used for decompression surgery for LSS? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)
Does decompression surgery with fusion for high-grade spondylolisthesis require IONM?	Yes
	No
	I do not do fusion surgery for high-grade spondylolisthesis at all.
Which IONM modality should be used for high-grade spondylolisthesis? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)

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Questionnaire	Category
Does the resection surgery for EMSCT require IONM?	Yes
	No
	I do not do EMSCT at all.
Which IONM modality should be used for resection surgery for EMSCT? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
Does the resection surgery for cauda equina tumors require IONM?	Yes
	No
	I do not do cauda equina tumor surgery at all.
Which IONM modality should be used for resection surgery for cauda equina tumors? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)
Does decompression surgery for LSS require IONM?	Yes
	No
	I do not do LSS surgery at all.
Which IONM modality should be used for decompression surgery for LSS? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)
Does decompression surgery with fusion for low-grade spondylolisthesis require IONM?	Yes
	No
	I do not do fusion surgery for low-grade spondylolisthesis at all.
Which IONM modality should be used for low-grade spondylolisthesis? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)
Does decompression surgery with fusion for high-grade spondylolisthesis require IONM?	Yes
	No
	I do not do fusion surgery for high-grade spondylolisthesis at all.
Which IONM modality should be used for high-grade spondylolisthesis? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	Triggered EMG
	Others (free description)

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**Supplement 1.** Continued

Questionnaire	Category
Does cervical instrumentation, i.e., lateral mass or pedicle screws require IONM?	Yes
	No
	Others (free description)
Which IONM modality should be used for cervical instrumentation, i.e., lateral mass or pedicle screws? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
	Others (free description)
Does thoracic instrumentation, i.e., pedicle screws require IONM?	Yes
	No
	Others (free description)
Which IONM modality should be used for thoracic instrumentation, i.e., pedicle screws? (You may select more than one option.)	Tc-MEP
	SEP
	Spontaneous EMG
	D-wave
	Triggered EMG
	Others (free description)

IONM, intraoperative neurophysiological monitoring; Tc-MEP, transcranial electrical stimulated motor evoked potentials; SEP, somatosensory evoked potentials; EMG, electromyography; Sp-SCEP, spinal cord-evoked potential after electrical stimulation of the spinal cord; D-wave, transcranial electrical stimulated spinal cord-evoked potential (Tc-SCEP); ASD, adult spinal deformity; OPLL, ossification of the posterior longitudinal ligament; CSM, cervical spondylotic myelopathy; OYL, ossification of yellow ligament; IMSCT, intramedullary spinal cord tumor; EMSCT, extramedullary spinal cord tumor; LSS, lumbar spinal stenosis.