SEASTNAN
MEDICAL

INTRODUCTION TO INTRAOPERATIVE NEUROMONITORING (IONM)

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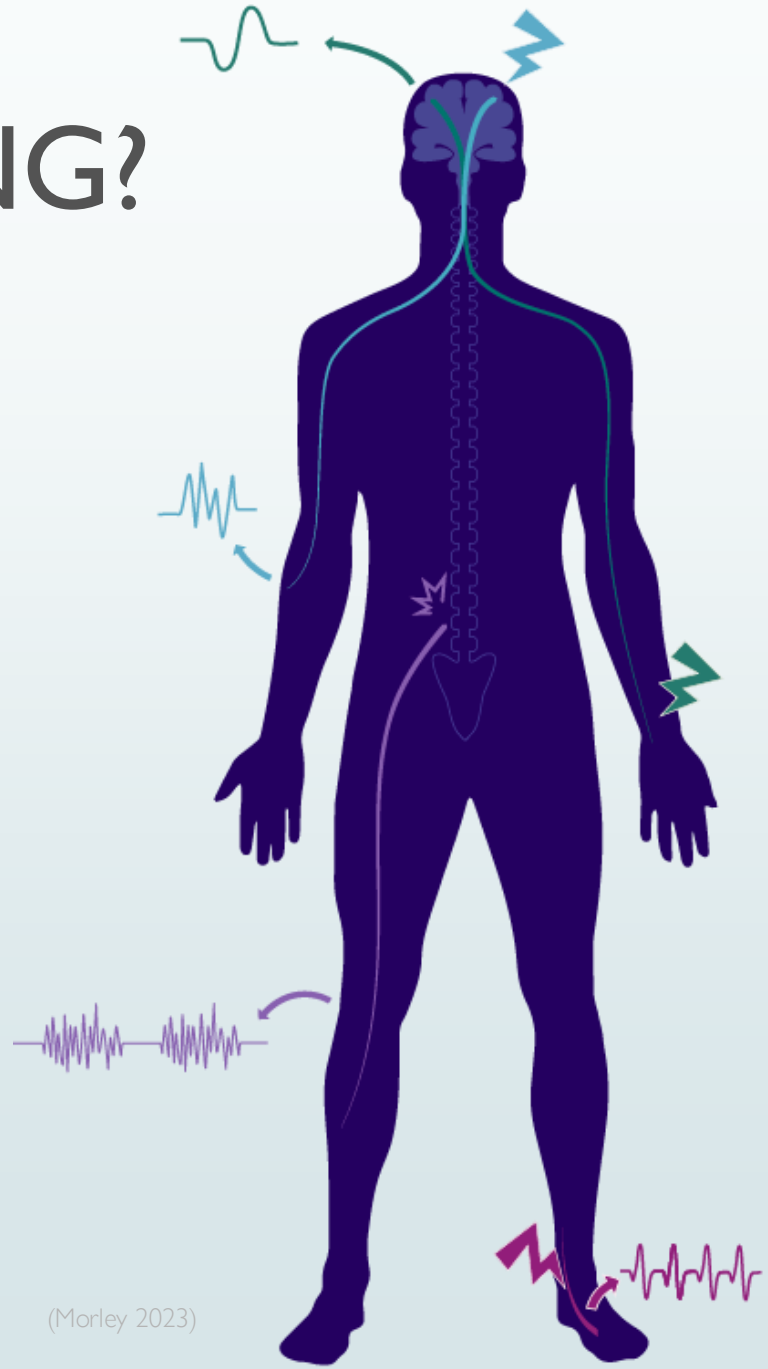
WHAT IS NEUROMONITORING?

AKA IONM FOR INTRAOPERATIVE NEUROMONITORING

- **Stimulating** nervous system & **recording** responses
- Assesses neurological functionality throughout surgery
- Some monitorable nervous system components:
  - Movement
  - Sensation
  - Audition
  - Vision
  - Cerebral perfusion



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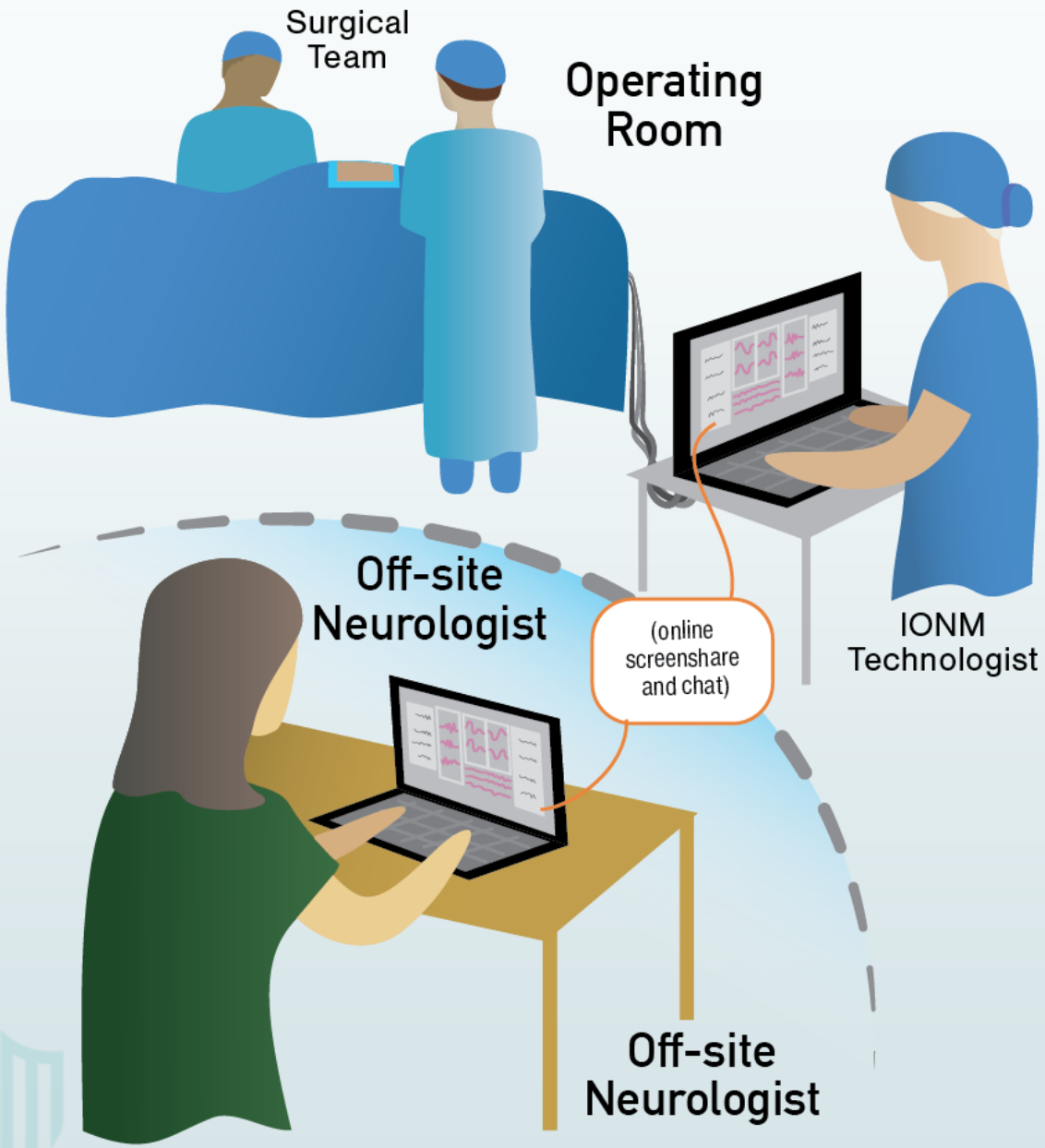

HOW DOES IT WORK?

- Lots of electrodes! Placed on patient, connected to IONM equipment
- Setup before incision
- Data continuously monitored for throughout case
- Screen-sharing neurologist for interpretation
- Ongoing communication with surgeon

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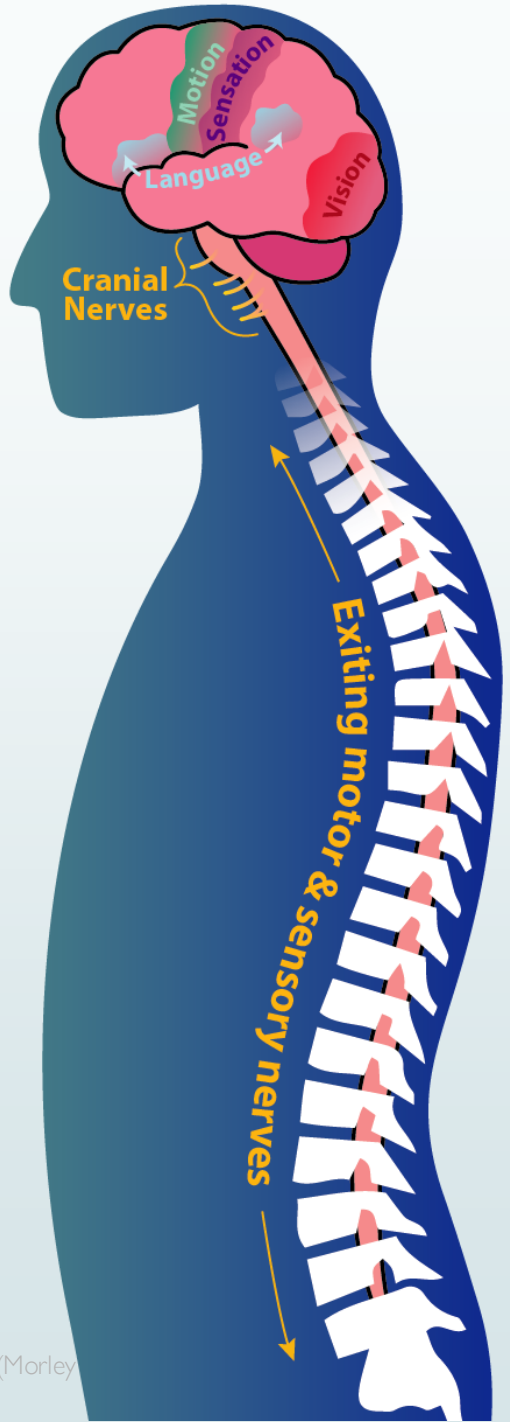
WHY USE IONM?

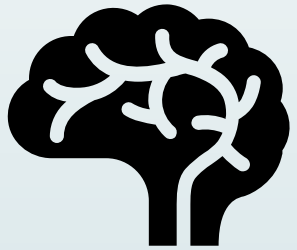
- Fewer post-op neurologic complications
- Seastnan data: average of 5-8 "alerted" cases/month per hospital
- Examples of alerts:
    - Poor limb positioning
    - Pedicle screw misplacement (spinal fusions)
    - Loss of sensory/motor function after medical device placement, decompression, tumor resection
    - Inadequate cerebral perfusion during vascular surgery
- Surgical intervention after alert can prevent post-op deficits

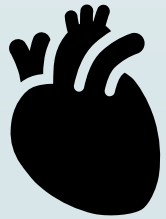


(Morley

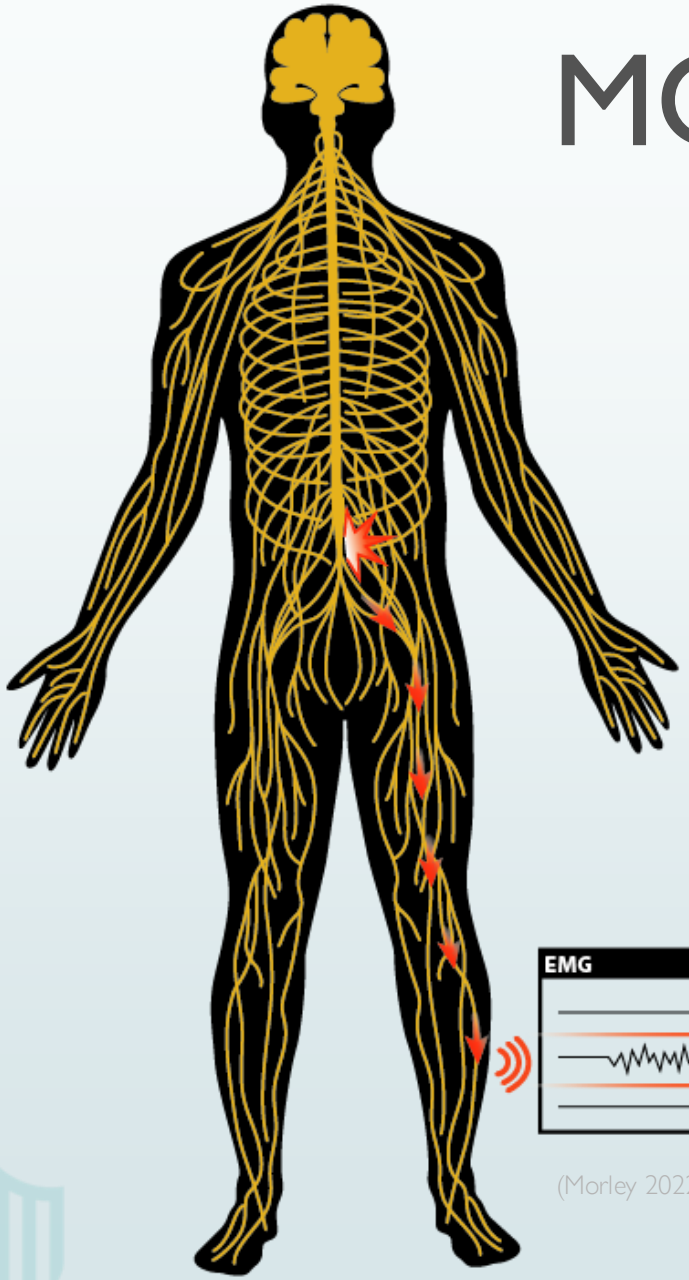
COMMON IONM CASES

- **Spine**
  - Fusions
  - Unstable fractures
  - Decompressions around nervous structures
- **Brain**
  - Neurovascular procedures
  - Tumor resections around nervous structures
- **Vascular**
  - Carotid endarterectomies

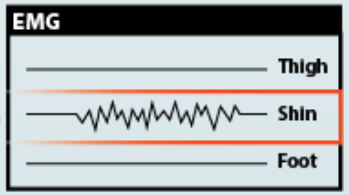




MODALITIES: EMG



- Monitors muscle activity caused by nerve stimulation
  - Spontaneous: nerve irritated by surgical activity
    - Ex: decompression of tissue too close to nerve root
  - Triggered: stimulation from probe to identify location of nerve
    - Ex: nerve embedded in tumor



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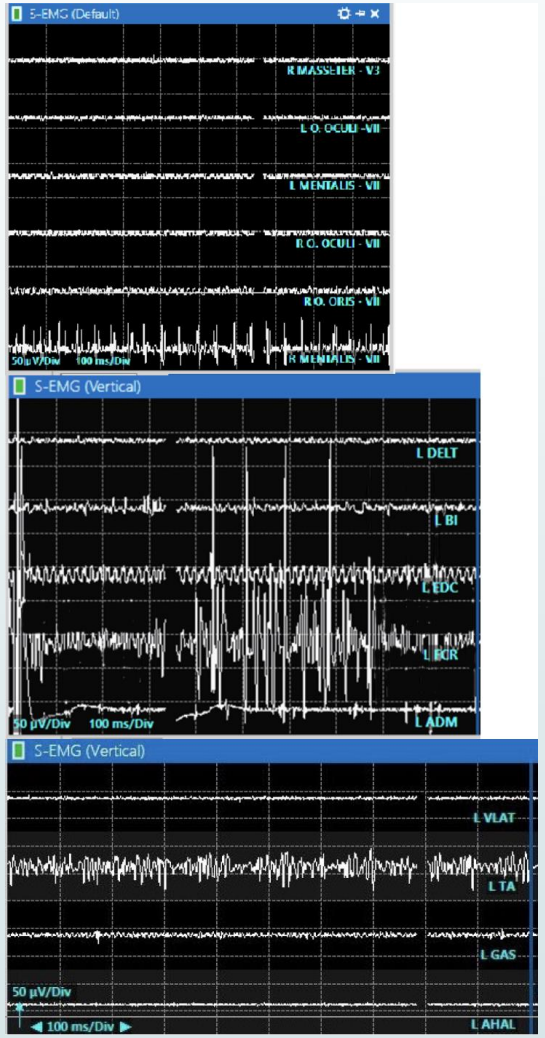
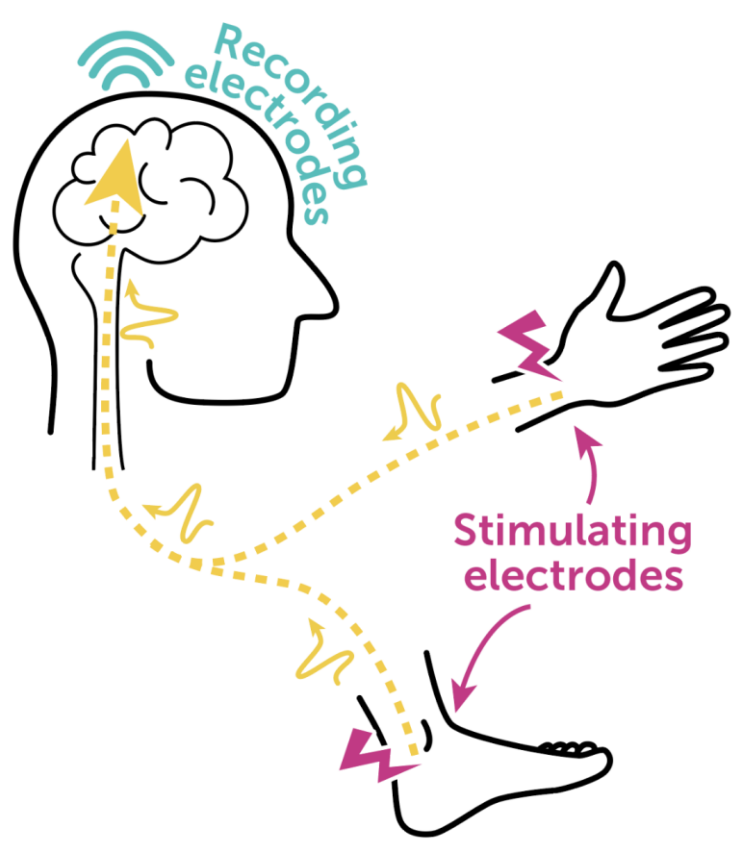
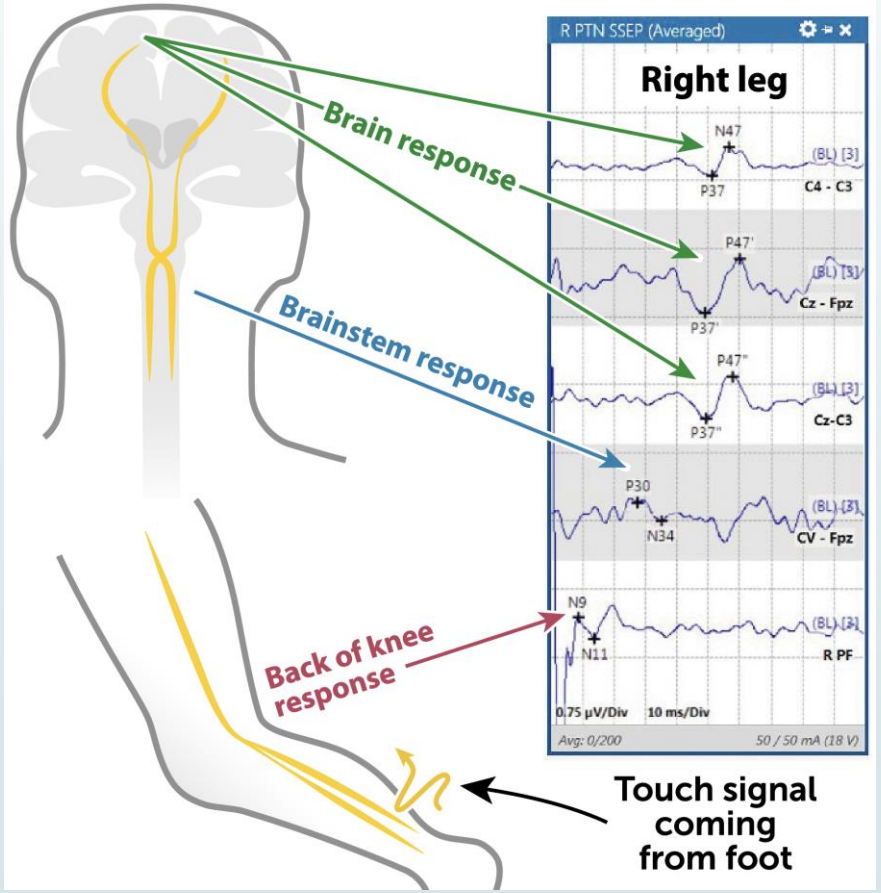
Data looks like spikes, bursts, scratches



MODALITIES: SOMATOSENSORY EVOKED POTENTIALS (SSEPS)



- Monitor somatosensation
  - Stimulation at peripheral nerve
  - Recording at scalp (or periphery)
  - Signals from multiple locations in pathway look like waves



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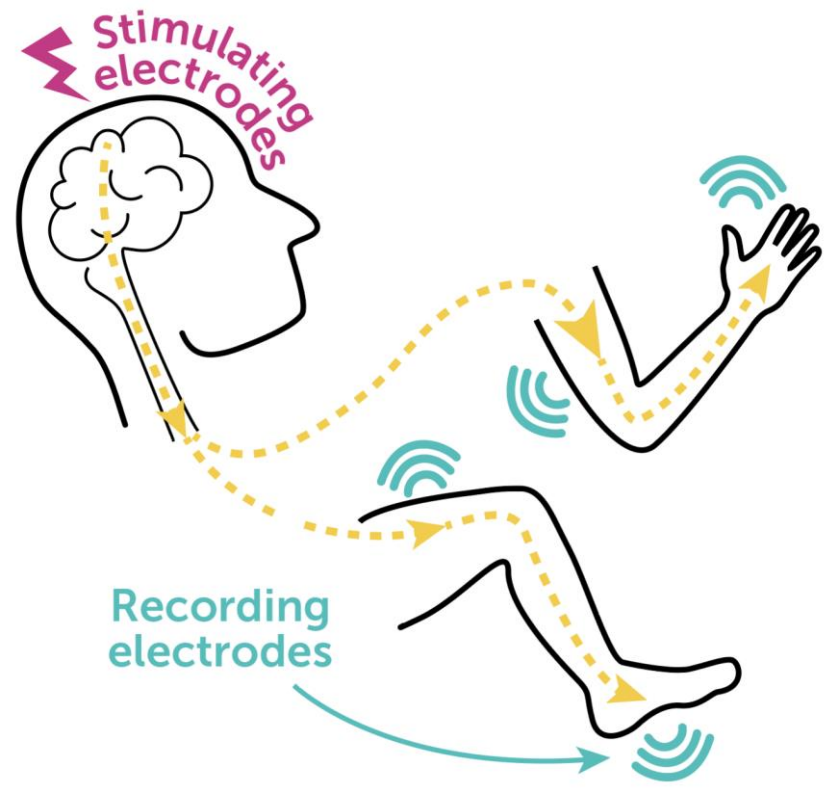
MODALITIES: TRANSCRANIAL MOTOR EVOKED POTENTIALS (TCMEPS)



- Monitor voluntary movement
  - Stimulation at scalp
  - Recording at muscles throughout body
  - Causes whole body twitch

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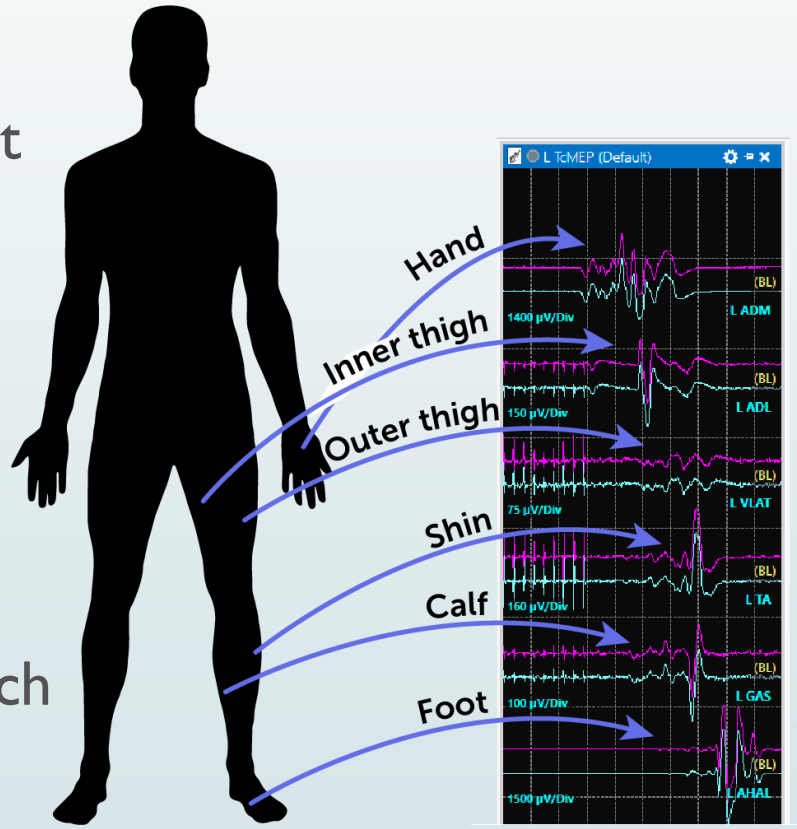
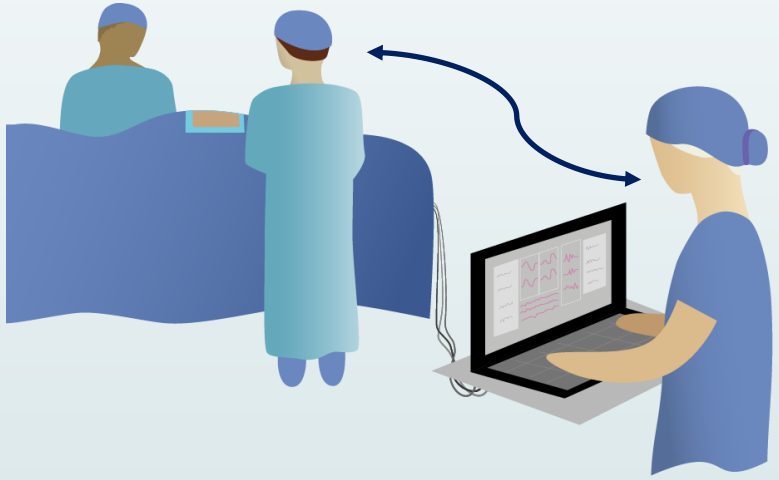


Example data from a lower back surgery

COMMUNICATION

- Neurophysiologist reports pertinent information to aid optimal outcome of case
    - Data updates help surgeon know whether patient remains neurologically stable or experiencing changes
    - If changes, surgeon can evaluate & assess next steps
- Regular communication with anesthesia & surgeon essential to provide best patient care



ABOUT SEASTNAN MEDICAL

- Founded in 2012 by Olivia Fisher with one hospital
  - 100% woman-owned business
  - Team has grown to about 10 surgical neurophysiologists
  - Provides intraoperative neuromonitoring to hospitals surrounding Kansas City, Topeka and Lawrence
- On-call weeknight and weekend hours taken on rotation
- Currently no overnight travel
- Daily schedule variable, but weekly average OR hours generally <40

IN-HOUSE TRAINING PROGRAM

- Training program established in 2019
- Introduction IONM trainee program consists of 10 didactic units (roughly 10 weeks)
  - Didactic curriculum concurrent with clinical training
  - Progress from trainee to independent technologist to CNIM certified
- Advanced surgical procedure and IONM modality courses to follow
  - Complex spine and craniotomy cases requiring additional modalities
- Typically initiate training class in January and in summer (following winter and spring graduations)

QUESTIONS?

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