



ICU EEG
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MNASET Fall Conference

Goals

- To discuss ICU EEG practicalities with the goal of helping technologists to become more confident working in the setting.
- To stimulate conversation and sharing of experiences.

Topics

- Navigating the ICU
- MRI Conditional / CT Compatible Wires
- Skin Breakdown
- ACNS Standardized EEG Terminology
- Ictal - Interictal Continuum
- Setting Parameters
- ICU Artifacts
- Compassion Fatigue and Burnout in EEG Technologists

Navigating the ICU

- Don't be intimidated.
- We are also providing a service important to patient care.
- Identify the patients primary nurse and discuss you needs with them.
- It may be helpful to call ahead.
- Notify the Neurologist if there will be a significant delay.
- Space can be hard to come by.
- Make sure to get as good of a camera angle as possible.

Navigating the ICU

- Access to patients head may be difficult due to surgical incisions, wraps, drains and ICP monitors.
- May be bloody or covered in residue from antiseptic preparations.

What troubles do you have getting set up in the ICU?

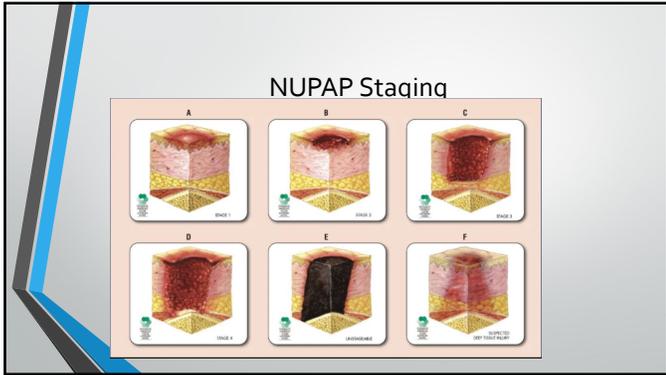
MRI Conditional / CT Compatible Wires

- The use of disposable MRI Conditional / CT compatible wires are highly recommended.
- Eliminates the need to remove and replace the EEG leads for scans.
- Nursing staff can disconnect and reconnect.
- It is important to discuss with the radiology department before implementation.

How many of your departments use disposable MRI Conditional/CT Compatible leads in the ICU?

Skin Breakdown

- See Petra's 2019 presentation.
- Hospitals are increasingly more vigilant regarding the identification of skin breakdown.
- Recommended to meet with ICU staff, wound care and administration to set realistic expectations and communication methods.
- Move the location of EEG leads prone to pressure.
- The use of the NUPAP pressure injury guidelines as well as the FL.E.S.H. scale can be useful communication tools.
- Document skin breakdown before during and after EEG placement.



Florida Electroneurodiagnostic Skin Health Scale
F.L.E.S.H. Scale®

This scale has been designed to assist in the objective measurement of skin "breakdown" associated with epilepsy and long-term EEG monitoring.

RATING	DESCRIPTION	INTERVENTIONS
0	Normal, intact skin	N/A
1	Redness without loss of skin integrity	Move electrode and document
2	Loss of skin integrity Breakdown less than 2 mm	Move electrode, notify nurse, and treat with antibiotic ointment
3	Loss of skin integrity Breakdown 2 - 4 mm	Move electrode, notify nurse, and treat with antibiotic ointment
4	Loss of skin integrity Breakdown greater than or equal to 5mm WITHOUT drainage	Move electrode, notify nurse, and treat with antibiotic ointment
5	Loss of skin integrity Breakdown greater than or equal to 5 mm WITH colored drainage OR crusting (pus or blood)	Move electrode, notify nurse, treat with antibiotic ointment, and Wound care consult

EXAMPLE OF SKIN CARE DOCUMENTATION:

- Electrode name, (F.L.E.S.H. Rating, and electrode movement)
 - RP13, electrode moved 1 cm superior to its original position
 - FQ2, electrode moved 1 cm superior to its original position
 - Electrode sites rated 2 or higher were treated with antibiotic ointment and the nurse was notified and viewed all breakdown sites

0 cm 1 2 3 4 5 6 7

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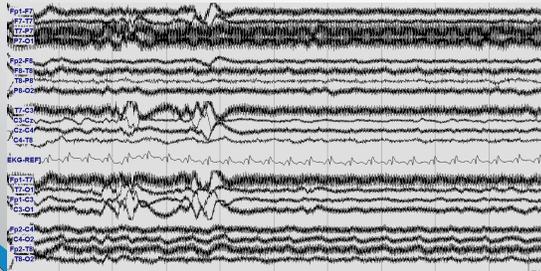
RATING	DESCRIPTION	EXAMPLE	RATING	DESCRIPTION	EXAMPLE
0	Normal, intact skin		3	Loss of skin integrity Breakdown 2 - 4 mm	
1	Redness without loss of skin integrity		4	Loss of skin integrity Breakdown greater than or equal to 5 mm WITHOUT drainage	
2	Loss of skin integrity Breakdown less than 2 mm		5	Loss of skin integrity Breakdown greater than or equal to 5 mm WITH colored drainage OR crusting (pus or blood)	

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ICU Artifacts

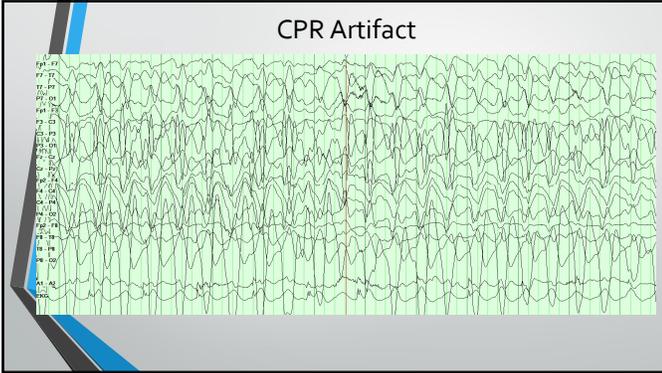
- Artifacts in the ICU can sometimes be hard to identify and eliminate.
- It is important to identify artifact if possible.
- Unplug devices suspected of artifact – discuss with nurse before.

60 hz

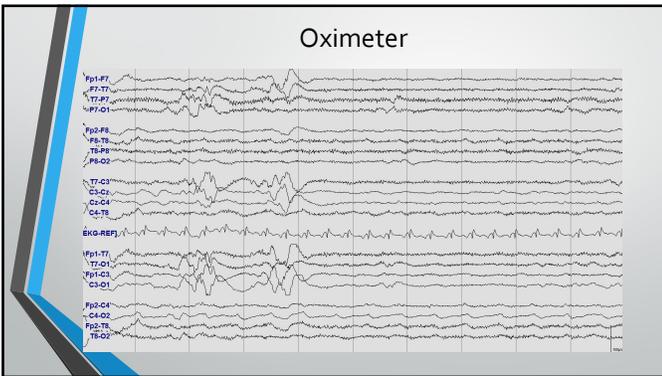


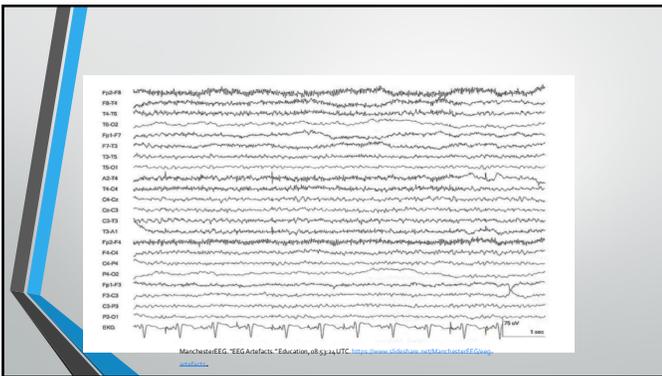
Ventilator Artifact

CPR Artifact

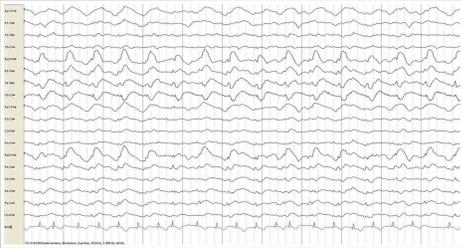


Oximeter





Ultrasound Transducer



Ramirez-Molina, Jorge Luis, and Luis Carlos Mayo. "Waveform Window #3: A Novel EEG Artifact in the ICU: Ultrasound Transducer Simulates Ictal Activity." *The Neurodiagnostic Journal*, no. 4 (January, 2020): 59-66. <https://doi.org/10.1002/nd.1303>

Other Artifacts

- Sweat, muscle, and ballistocardiographic artifact
- Electrode, telephone, and other electronic devices artifact
- Glossokinetic artifact
- IV Drip artifact
- Movement artifact
- Nursing Cares
- NG tubes

What unique ICU artifacts have you encountered?

Setting Parameters

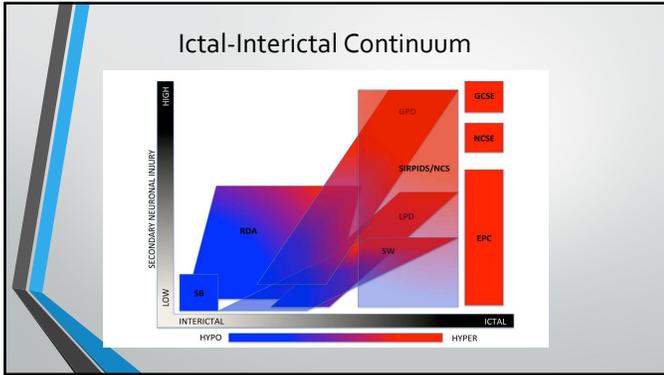
- It is important to communicate with the neurologist regarding what they would like to be paged for on any given patient.
- Try to get the physician to set defined parameters.
- Having parameters can help the monitoring technologist to be comfortable with when to page or not to page.
- Can save the Neurologist unnecessary pages as well as alleviate stress on the technologist.

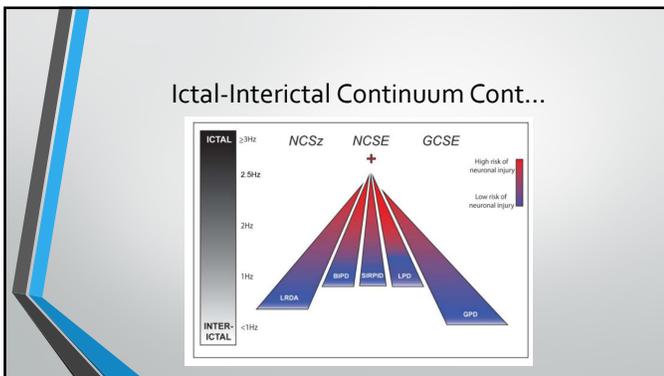
Questions for the physician

- What EEG patterns would you like to be paged for?
- Is there a certain number of seizures or a seizure burden that you would like as a cutoff before paging.
- Keep in mind that it is the physicians responsibility to determine what they are calling a seizure.
- Always page for new events, new event types or suspicious waveforms.

Ictal-Interictal Continuum

- When is a pattern encephalopathic and when is it seizure?
- Sometimes the distinction may be clear - other times not so much.
- When does the physician want to be notified.





How many of your EEG departments have a policy regarding setting parameters on critically ill patients?

How many technologists are writing daily technical reports for critical care patients?

ABRET NeuroAnylist - CLTM Credential

 <p>NeuroAnalyst-CLTM Eligibility Requirements</p>	NeuroAnalyst-CLTM Credential Pathway I – Bachelor's Degree Bachelor's Degree (or higher)	NeuroAnalyst-CLTM Credential Pathway II – No Degree, Practice Track¹
	Two years as a CLTM technologist	Three years as a CLTM technologist
	30 Advanced Practice 1EM CLTs	50 Advanced Practice 1EM CLTs
	Documentation of 50 technical reports	Documentation of 50 technical reports
	¹ Continuation of the Practice Track will be evaluated annually. NA-CLTM Credential awarded after successful completion of the NeuroAnalyst-CLTM Exam.	

Compassion Fatigue and Technologist Burnout

- Taking care of critical care patients can be emotionally taxing.
- We spend a lot of time caring for and monitoring a patient as well as interacting with family and friends.
- Other care providers may not realize how much time we really spend on each patient.
- Watching someone's brain activity can be emotional for us – the waveforms have meaning.
- It's okay to have emotions.

Compassion Fatigue and Technologist Burnout

- COVID has added increased stress levels.
- Lack of information on the number of technologists leaving the field or reducing their hours.
- Lack of discussion regarding the emotional impact on technologist.
- Who can we talk to? -HIPAA

Open Discussion:

What experiences do you have with tech burnout or compassion fatigue?
