NeuroTrace Study Guide

Domain: Domain II – EEG Procedures & Data Acquisition
Section: EEG Recording Procedures & Patient Preparation
Style: Stepwise, procedural, exam-oriented

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1. Core Principles (Must Know)

Quality EEG Begins Before Electrodes Are Applied

- **Quality EEG begins before electrodes are applied**
- Preparation is essential
- Cannot fix poor preparation later
- Good preparation = good data
- Poor preparation = poor data

Patient Cooperation Directly Affects Signal Quality

- **Patient cooperation directly affects signal quality**
- Cooperative patient = better signal
- Uncooperative patient = more artifacts
- Clear instructions improve cooperation
- Patient comfort improves cooperation

Preparation Errors Lead to Artifact and Misinterpretation

- **Preparation errors lead to artifact and misinterpretation**
- Poor preparation creates artifacts
- Artifacts can mimic pathology
- May lead to false interpretation
- Prevention is better than correction

Key Principle

- **Good preparation prevents poor data**
- Invest time in preparation
- Preparation saves time later
- Quality preparation = quality data
- Cannot compensate for poor preparation

Practical Application

- Always prepare thoroughly
- Follow standardized workflow
- Document preparation steps
- Address issues before recording

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2. Pre-Study Patient Assessment

Verify Patient Identity

- **Verify patient identity:** Essential safety step
- Use two identifiers (name, DOB)
- Match to order/requisition
- Confirm correct patient

- Document verification

Review Referral Indication

- **Review referral indication:** Understand clinical question
- Why is EEG being performed?
- What is the clinical question?
- What findings are expected?
- Guides recording strategy

Screen For

Seizure History

- **Seizure history:** Important for safety
- Recent seizures?
- Seizure type?
- Triggers?
- Safety considerations

Medical Contraindications

- **Medical contraindications:** Safety first
- Cardiac conditions (HV contraindicated)
- Respiratory conditions (HV contraindicated)
- Sickle cell disease (HV contraindicated)
- Other medical conditions

Recent Sleep Deprivation

- **Recent sleep deprivation:** Affects recording
- Sleep-deprived patients may fall asleep
- May affect background
- May enhance epileptiform activity
- Document sleep history

Explain Procedure in Simple Terms

- **Explain procedure in simple terms:** Improve cooperation
- Use clear, simple language
- Explain what will happen
- Address patient concerns
- Answer questions

Best Practice

- Always verify identity
- Review clinical indication
- Screen for contraindications
- Explain procedure clearly

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3. Patient Preparation Steps

Ensure

Clean Scalp

- **Clean scalp:** Essential for good contact

- Remove oils and products
- Clean with alcohol if needed
- Dry thoroughly
- Ensures low impedance

No Oils or Hair Products

- **No oils or hair products:** Interfere with contact
- Oils prevent good contact
- Hair products create barriers
- Must remove before application
- May need to clean scalp

Position Patient Comfortably

- **Position patient comfortably:** Reduces movement
- Comfortable position
- Support head and neck
- Reduce muscle tension
- Prevent discomfort

Remove Metallic Accessories

- **Remove metallic accessories:** Prevent artifacts
- Jewelry, hairpins, etc.
- May create artifacts
- May interfere with recording
- Remove before recording

ABRET Emphasis

- **Clear patient instructions reduce movement artifact**
- Good instructions = less movement
- Poor instructions = more movement
- Clear communication is essential
- Reduces artifacts

Best Practice

- Prepare scalp properly
- Position patient comfortably
- Remove interfering items
- Give clear instructions

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4. Pre-Recording Equipment Checks

Verify

Impedance Levels

- **Impedance levels:** Essential for quality
- Check all electrodes
- Target: <5 kΩ (ideal)
- Acceptable: <10 kΩ
- Document impedance levels

Electrode Connections

- **Electrode connections:** Ensure all connected
- Verify all electrodes connected
- Check for loose connections
- Test connections
- Fix problems before recording

Amplifier and Filter Settings

- **Amplifier and filter settings:** Verify correct settings
- Sensitivity: 7.5–10 μV/mm (routine)
- LFF: 0.5–1 Hz (routine)
- HFF: 35–70 Hz (routine)
- Notch: Off (unless needed)

Sampling Rate and Timebase

- **Sampling rate and timebase:** Verify correct settings
- Sampling rate: ≥200 Hz
- Timebase: 30 mm/s (routine)
- Verify settings match protocol
- Document settings

Best Practice

- Check all equipment before recording
- Verify all settings
- Document equipment status
- Fix problems before starting

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5. During Recording

Monitor

Patient State

- **Patient state:** Essential for interpretation
- Wake, drowsy, sleep
- Document state changes
- Note transitions
- Important for interpretation

Artifacts

- **Artifacts:** Identify and document
- Movement artifacts
- Muscle artifacts
- Eye movement artifacts
- Other artifacts

Electrode Stability

- **Electrode stability:** Monitor continuously
- Check for electrode pops
- Monitor impedance
- Watch for disconnections
- Fix problems immediately

Provide Instructions

Eye Opening/Closure

- **Eye opening/closure:** Test reactivity
- "Open your eyes" (test alpha reactivity)
- "Close your eyes" (restore alpha)
- Document reactivity
- Essential for background assessment

Activation Procedures

- **Activation procedures:** As indicated
- Hyperventilation (if appropriate)
- Photic stimulation (if appropriate)
- Sleep (if indicated)
- Follow protocols

Best Practice

- Monitor continuously
- Provide clear instructions
- Document patient state
- Address problems immediately

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6. Post-Recording Tasks

Safely Remove Electrodes

- **Safely remove electrodes:** Patient comfort
- Remove gently
- Clean skin if needed
- Check for skin irritation
- Ensure patient comfort

Clean Equipment

- **Clean equipment:** Infection control
- Follow disinfection protocols
- Clean electrodes properly
- Clean cables
- Store equipment properly

Document

Patient Cooperation

- **Patient cooperation:** Important for interpretation
- Good, fair, poor cooperation
- Movement during recording
- Instructions followed
- Affects interpretation

Technical Issues

- **Technical issues:** Document all issues
- Equipment problems
- Electrode problems

- Interruptions
- Resolution of issues

Events During Recording

- **Events during recording:** Document all events
- Seizures
- Patient behaviors
- State changes
- Clinical observations

Best Practice

- Remove electrodes safely
- Clean equipment properly
- Document all relevant information
- Complete documentation

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7. Common ABRET Exam Traps

Trap 1: Skipping Patient Instruction

- **Reality:** Instructions are essential
- **Trap:** May skip instructions to save time
- **Solution:** Always provide clear instructions
- **ABRET focus:** Patient preparation requirements

Trap 2: Ignoring Comfort and Positioning

- **Reality:** Comfort affects cooperation
- **Trap:** May not ensure patient comfort
- **Solution:** Always position comfortably
- **ABRET focus:** Patient care

Trap 3: Failing to Document Cooperation

- **Reality:** Cooperation affects interpretation
- **Trap:** May not document cooperation
- **Solution:** Always document cooperation
- **ABRET focus:** Documentation requirements

Trap 4: Proceeding with Poor Impedance

- **Reality:** Poor impedance = poor data
- **Trap:** May proceed with high impedance
- **Solution:** Fix impedance before recording
- **ABRET focus:** Quality standards

Trap 5: Not Checking Equipment Before Recording

- **Reality:** Equipment checks are mandatory
- **Trap:** May skip equipment checks
- **Solution:** Always check equipment first
- **ABRET focus:** Pre-study checks

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8. Case-Based Example

Scenario

Clinical Setting: Routine EEG recording
Problem: EEG contaminated with movement artifact
Observation: Excessive movement throughout recording
Question: What is the root cause?

Root Cause

- **Inadequate patient instruction**
- Patient not properly instructed
- Patient didn't understand what to do
- Patient uncomfortable or anxious
- Poor communication

Corrective Action

- **Re-explain procedure and reposition patient**
- Explain procedure clearly
- Reposition for comfort
- Address patient concerns
- Improve communication

Teaching Point

- **Communication is part of EEG technique**
- Good communication = good data
- Poor communication = poor data
- Communication is essential skill
- Must communicate effectively

ABRET Application

- Given artifact problem → consider preparation
- Given movement artifact → check instructions
- Given poor quality → review preparation steps
- Must know preparation requirements

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9. Exam Readiness Checklist

Use this checklist to verify your understanding:

- ☐ Can perform patient preparation (clean scalp, positioning, instructions)
- ☐ Can verify technical settings (impedance, filters, sensitivity, sampling)
- ☐ Can monitor recording quality (patient state, artifacts, electrode stability)
- ☐ Can document procedural details (cooperation, issues, events)
- ☐ Understand that quality begins before electrodes
- ☐ Know that patient cooperation affects quality
- ☐ Recognize that preparation errors cause artifacts
- ☐ Know that good preparation prevents poor data
- ☐ Can identify common preparation errors
- ☐ Understand that communication is essential
- ☐ Know that equipment checks are mandatory

- [ ] Can apply standardized workflow

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10. Internal Cross-Links

Standards

- **Patient Safety:** Safety considerations in preparation
- **Quality Assurance:** Equipment checks and maintenance

Workflow

- **Electrode Placement (10-20):** Where electrodes are placed
- **Electrodes & Impedance:** Impedance requirements and checks

Patterns

- **Artifacts:** How preparation affects artifacts
- **Background Activity:** How preparation affects background

Cases

- **Procedural error cases:** Cases involving preparation errors
- **Artifact prevention cases:** Cases requiring good preparation

Quizzes

- **Recording procedure MCQs:** Questions on preparation and procedures
- **Patient preparation questions:** Questions on patient preparation
- **Equipment check questions:** Questions on pre-study checks

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Study Tips

1. **Memorize preparation steps:** Patient assessment, scalp preparation, positioning
2. **Learn equipment checks:** Impedance, connections, settings, sampling
3. **Know monitoring requirements:** Patient state, artifacts, electrode stability
4. **Understand documentation:** Cooperation, issues, events
5. **Remember the principle:** Good preparation prevents poor data
6. **Know the traps:** Skipping instructions, ignoring comfort, poor impedance
7. **ABRET focus:** Expect questions on preparation steps, equipment checks, and documentation

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End of Study Guide

For additional practice, complete quiz questions tagged: patient-preparation, recording-procedures, artifacts