

# NeuroTrace Study Guide

**Domain:** Domain II – Performing the EEG Study

**Section:** Special Protocols (Neonatal/ICU/ECI)

**Style:** Protocol-specific, age-adapted, exam-oriented

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## 1. Core Principles (Must Know)

### Special Populations Require Special Protocols

- **Special populations require adapted protocols**
- Neonatal, ICU, and ECI patients have unique needs
- Protocols must be age-appropriate and condition-specific
- Understanding special protocols is essential

### Age-Specific Considerations

- **Age-specific considerations are critical**
- Neonatal patterns differ from adult patterns
- Electrode placement adapts for head size
- Normal patterns vary with age

### Key Principle

- **Special protocols ensure appropriate care for special populations**
- Adapt techniques for age and condition
- Understand age-specific normal patterns

### Practical Application

- Learn neonatal protocols
  - Understand ICU continuous monitoring
  - Know ECI considerations
  - Adapt techniques appropriately
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## 2. Neonatal EEG Protocols

### Electrode Placement

- **Modified 10-20 system:** 9-11 electrodes (reduced array)
- **Appropriate spacing:** For smaller head size
- **Standard locations:** Adapted for head size
- **Measurements:** Use nasion, inion, preauricular points

### Recording Parameters

- **Sensitivity:** Higher sensitivity (lower  $\mu$ V/mm) for lower amplitude
- **Timebase:** May use slower paper speed
- **Filters:** Standard (0.5-70 Hz) typically appropriate
- **Duration:** Longer recordings often needed

### Normal Patterns

- **Trace alternant:** Alternating activity and quiescence (quiet sleep, term neonates)
- **Discontinuous pattern:** Periods of activity and quiescence (premature neonates)

- **Active sleep vs quiet sleep:** Different from adult sleep stages
- **Age-dependent:** Patterns change with conceptual age (gestational + postnatal)

#### Key Rule

- **Neonatal patterns are age-specific and state-dependent**
  - Understand conceptual age
  - Recognize normal neonatal patterns
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## 3. ICU Continuous Monitoring

#### Purpose

- **Continuous monitoring detects seizures and patterns**
- Nonconvulsive status epilepticus detection
- Pattern recognition (burst-suppression, periodic discharges)
- Treatment monitoring

#### Setup

- **Electrode placement:** Standard or modified based on patient condition
- **Recording duration:** Continuous (hours to days)
- **Monitoring:** Remote or bedside
- **Alerts:** Automated or manual pattern detection

#### Common Patterns

- **Burst-suppression:** Periods of activity alternating with suppression
- **Periodic discharges:** PLEDs (lateralized), GPDs (generalized)
- **Ictal patterns:** Evolving rhythmic activity
- **Rhythmic delta activity (RDA):** Focal or lateralized

#### Event Detection

- **Ictal patterns:** Evolving frequency, amplitude, distribution
- **Status epilepticus:** Continuous or prolonged seizure activity
- **Pattern changes:** Indicating clinical changes
- **Immediate notification:** For concerning patterns

#### Key Rule

- **ICU monitoring requires immediate notification of concerning patterns**
  - Know when to notify medical team
  - Understand ICU-specific patterns
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## 4. ECI (Epilepsy Monitoring Unit) Protocols

#### Purpose

- **ECI protocols optimize seizure capture**
- Long-term monitoring for seizure characterization
- Pre-surgical evaluation
- Medication adjustment monitoring

#### Setup

- **Extended recording:** Days to weeks

- **Video-EEG:** Synchronized video and EEG
- **Activation procedures:** Sleep deprivation, medication reduction
- **Patient safety:** Seizure response protocols

### Key Considerations

- **Seizure safety:** Protocols for seizure management
- **Medication management:** May reduce medications
- **Activation:** Aggressive activation procedures
- **Documentation:** Detailed event documentation

### Key Rule

- **ECI protocols optimize diagnostic yield**
- Understand activation strategies
- Ensure patient safety

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## 5. Age-Specific Modifications

### Neonatal Modifications

- **Fewer electrodes:** 9-11 typical
- **Higher sensitivity:** Lower amplitude signals
- **Longer recordings:** May need extended time
- **Parent presence:** For comfort and safety

### Pediatric Modifications

- **Standard electrode count:** Full 10-20 system
- **Age-appropriate patterns:** Slower PDR, more prominent sleep spindles
- **Child-friendly environment:** Comfort measures
- **Parent/caregiver presence:** As appropriate

### Key Rule

- **Adapt protocols for patient age and condition**
- Understand age-specific norms
- Ensure patient comfort and safety

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## 6. Documentation for Special Protocols

### Required Documentation

- **Protocol used:** Neonatal, ICU, ECI
- **Modifications:** Any deviations from standard
- **Patient condition:** Relevant clinical information
- **Patterns observed:** Age-appropriate interpretation
- **Events:** All clinical events and EEG correlates

### Key Rule

- **Document protocol-specific information**
- Note any modifications
- Include age-specific considerations

## 7. Exam Readiness Checklist

Use this checklist to verify your understanding:

- Understand neonatal electrode placement (9-11 electrodes, modified 10-20)
  - Know neonatal normal patterns (trace alternant, discontinuous, active/quiet sleep)
  - Understand ICU continuous monitoring setup and purpose
  - Can identify ICU patterns (burst-suppression, PLEDs, GPDs, RDA, ictal)
  - Know when to notify medical team during ICU monitoring
  - Understand ECI protocols (extended recording, video-EEG, activation)
  - Know age-specific modifications (neonatal, pediatric)
  - Understand conceptual age (gestational + postnatal) for neonates
  - Can document special protocol information
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## 8. Internal Cross-Links

### Workflow

- **Recording Procedures:** Special protocols in workflow
- **Patient Safety:** Safety in special populations

### Patterns

- **Neonatal patterns:** Age-specific patterns
- **ICU patterns:** Continuous monitoring patterns

### Quizzes

- **Special protocols MCQs:** Questions on neonatal, ICU, ECI protocols
  - **Age-specific questions:** Questions on modifications
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## Study Tips

1. **Memorize neonatal protocols:** Electrode count, patterns, age considerations
  2. **Learn ICU patterns:** Burst-suppression, periodic discharges, ictal patterns
  3. **Understand ECI protocols:** Extended recording, video-EEG, activation
  4. **Know age-specific norms:** Neonatal vs pediatric vs adult
  5. **Practice pattern recognition:** ICU and neonatal patterns
  6. **Understand notification protocols:** When to notify medical team
  7. **ABRET focus:** Expect questions on special protocols, age-specific patterns, ICU monitoring, and neonatal EEG
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### End of Study Guide

For additional practice, complete quiz questions tagged: *neonatal, icu, eci, special-protocols, continuous-monitoring*