Advanced Fetal CNS MRI Techniques
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1. The most successful strategy in acquiring DTI data in non-sedated fetuses - so far - is
   A. Limiting acquisition time to 2 minutes
   B. Using navigator echoes/respiratory gating
   C. Using high angular resolution diffusion (HARDI)
   D. Using b-values over 1000s/mm²

Correct Answer: A

Reference:

2. Which fetal position/condition is most beneficial for advanced fetal MRI methods?
   A. Oligohydramnios and cephalic/vertex presentation
   B. Polyhydramnios and breech presentation
   C. Oligohydramnios and breech presentation
   D. Polyhydramnios and shoulder presentation

Correct Answer: A

Reference:

Sedating the Neonate: What We Need to Know
Richard B. Parad, MD, MPH

1. Which anaesthetic agent was NOT recently reported by the FDA to cause apoptosis, neurodegeneration and impair memory, learning and motor skills in rodents and primates?
   A. Dexmedetomidine
   B. Propofol
   C. Ketamine
   D. Servoflurane

Correct Answer: A
Rationale:
The FDA is warning, based on meta-analyses of animal studies, that the rapidly developing brain (fetal exposure in pregnant women and children under age 3) avoid exposure to these drugs for more than 60 minutes.

Reference:
http://www.fda.gov/Drugs/DrugSafety/ucm532356.htm

2. What success rate was reported for a recent “feed and sleep” protocol used in newborns undergoing MRI
   A. 25%
   B. 50%
   C. 75%
   D. 95%

Correct Answer: D

Rationale:
A careful protocol to avoid the need for sedation allowed for a high success rate in obtaining acceptable images.

Reference:

Neonatal Brain MR Protocols
Beth M. Kline-Fath, MD

1. What is an important factor that must be considered when performing standard sequences in the neonate?
   A. The water content of the brain is low and the protein and lipid contents high.
   B. The water content of the brain is low and the protein and lipid contents low.
   C. The water content of the brain is high and the protein and lipid contents high.
   D. The water content of the brain is high and the protein and lipid content low.

Correct Answer: D

Rationale:
The neonatal brain is higher in water than the adult brain and is relatively unmyelinated. Therefore, the correct answer is D. Because of this, the TR for the T1 and T2 imaging must be increased. A, B and C are therefore incorrect.

Reference:
2. With regard to imaging neonates, which is the safest and best technique to perform an MR exam?
   a. Sedate with general anesthesia
   b. Provide sedation with oral chloral hydrate
   c. Administer IV fentanyl
   d. Scan swaddled tightly after feeding

Correct Answer: D

Rationale:
The best technique for MR imaging in the neonate is to feed and swaddle. So the answer is D. A is incorrect as general anesthesia has been associated with neuronal cell death in the neonate. Oral chloral hydrate can result in sedation last for more than 12 hours and increased bradycardic events so B is incorrect. IV fentanyl has a high risk for respiratory depression and would not be preferred for sedation in the neonate so C is incorrect.

References: