Lecture 9 Quiz

Started: May 3 at 7:20pm

Quiz Instructions

Please choose the best answer for each question.

Question 1	1 pts

In the geometric derivation of the balanced SSFP signal, what 2 concepts do we use?

○ The assumption that magnetization length does not change and phase cycling

○ A matrix propagation followed by matrix inversion

○ The assumption that the magnetization length does not change, and the Bloch equation

○ Quadratic phase increment and the Bloch equation

Question 2	1 pts

In the geometric derivation, the ellipsoid upon which the magnetization lies between RF pulses

○ Has height M0/2 and maximum width (M0/2) sqrt(T2/T1)

○ Has height of M0 and maximum width (M0/2)sqrt(T2/T1)

○ has height of M0 and maximum width M0 sqrt(T2/T1)

○ Has height M0/2 and maximum width M0 sqrt(T2/T1)

Question 3

1 pts

In the signal-vs-frequency plot for balanced SSFP, at a moderately high flip angle, the nulls are spaced apart by a frequency of

○ 1/TR

○ 2/TR

○ 0.5/TR

○ 2pi

Question 4

1 pts

The effective flip angle, β, in balanced SSFP is useful because

○ It enables derivation using matrix inversion

○ It incorporates the flip angle and precession to simplify equations

○ It includes precession from multiple sources

○ It reduces the dark band artifact

Question 5

1 pts

The balanced SSFP signal is maximized for a precession phi such that

○ phi = 180 degrees

○ phi = 0

○ phi is such that the magnetization reaches the widest point of the ellipsoid

○ phi is such that the magnetization reaches the widest point of the ellipsoid, and if not possible, then when phi = 0

Question 6   1 pts

The signal on a gradient-spoiled sequence (such as FISP, GRE, GRASS or FFE) is approximately

○ The average magnitude of the balanced-SSFP frequency response, just after the excitation

○ The average magnitude of the balanced-SSFP frequency response, midway between RF pulses

○ The complex average of the balanced-SSFP frequency response, midway between RF pulses

○ The complex average of the balanced-SSFP frequency response, just after the excitation

Question 7   1 pts

Reversed gradient spoiling (PSIF, CE-FAST, T2-FFE, etc), compared to normal gradient spoiling

○ plays the spoiler before sampling, leading to more T2 contrast

○ samples both before and after the spoiler gradient

○ plays the spoiler before sampling, and has better refocusing properties

○ has identical signal distribution

Question 8   1 pts

Which statement is correct about RF-spoiled sequences:

○ They use a gradient spoiler in combination with quadratic RF phase increment to achieve pure T1 contrast

○ They use a gradient spoiler in combination with quadratic RF phase increment to achieve T2/T1 contrast

○ They use a gradient spoiler to achieve T2/T1 contrast

○ They use quadratic RF phase increment to achieve pure T1 contrast

Question 9   1 pts

An advantage and disadvantage of gradient-spoiling compared to balanced SSFP are

○ better contrast but worse motion sensitivity

○ no dark-band artifacts but lower signal

○ no dark-band artifacts but better motion insensitivity

○ better contrast but lower signal

Question 10   1 pts

At the Ernst angle, the signal from RF-spoiled sequences

○ is maximized, and less than both GRE or bSSFP signals

○ is maximized, and greater than both GRE or bSSFP signals

○ is maximized, and equal to both GRE or bSSFP signals

○ is maximized, for all three sequences

Quiz saved at 7:21pm   Submit Quiz