Introduction:. We studied 10 randomly selected, identical phantoms used in the American College of Radiology (ACR) MRI accreditation program and compared signal intensity means and standard deviations to corresponding values obtained by 4 measurements in an identical reference phantom. We report on the differences observed.
Methods: Phantoms were scanned on a GE Signa 1.5 T scanner and head coil using the protocol specified by the ACR for its accreditation program. Signal intensities were measured using Signa software (version 5.4.2). A random sample of 10 MR phantoms was scanned, and the signal intensities of two regions in the first slice were measured. A reference phantom was scanned 4 times to establish the uncertainty of measurement. We performed a t-test on the random and reference samples to determine P values for the hypothesis that there is no significant difference between the means of the two samples.
Results/Discussion: We find an uncertainty in measurement of 4-6%. P values range from 20-80%, indicating no convincing evidence for a difference between sample means. Therefore, variations in the data are attributable to uncertainties of measurement rather that variation of the phantoms themselves.
Conclusions: Measurements showed a high degree of consistency from phantom to phantom. Variations in measured quantities may be attributed to measurement uncertainties.
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