Specific Absorption Rate

What is Specific Absorption Rate?

Specific Absorption Rate, often shortened to SAR, is an estimate of the the RF energy deposited into the patient while scanning that may result in body temperature rise. SAR is not an exact 'amount' of RF, nor a specific level of heating, but an estimate based on patient weight, orientation, pulse sequence, acquisition parameters, and scan time. Each MR vendor utilizes different modeling for estimating SAR, so there may not be a 1-to-1 comparison between scanners, but broadly several things regarding SAR are constant:

- SAR will increase with field strength
- SAR will be higher with pulse sequences that use a lot of strong RF pulses
- SAR will be higher if strong RF pulses are closely spaced
- SAR will be higher as the number of slices increases
- SAR will be higher with many consecutive pulse sequences

SAR and Scanning

On even relatively older scanners, SAR is tracked throughout the scan, typically in 15 minute intervals. If the scanner senses SAR limits being exceeded, scanning will be prohibited and a 'cool down' time will have to occur before scanning can resume.