for SAR calculations. The computerized MRI head models have a spatial resolution of 1-3 mm. A frequency-specific permittivity of brain tissue is used for the homogeneous head model. The tissue permittivities such as those given in **Table 5** are used to represent each tissue type in the inhomogeneous model. Common head-phone positions have been used to examine SAR distributions in the head. **Table 6** presents a list of computed SAR for cellular telephones operating between 800-1800 MHz. The antennas simulated include 1/4-wave, 3/8-wave, 1/2-wave, and internal structures. It is seen that, for most of the cases, the maximum SAR anywhere in the head is below established guidelines, except for the 900 MHz monopole and 1800 MHz 1/2-wave antenna. Note that these results do not exhibit any discernable effect of antenna type or length on induced SAR. Questions have been raised concerning the intercomparability of computational results using different models of the human head and the mobile telephone transceiver. A particularly vexing problem is the influence of tissue inhomogeneity and the size of volume element on SAR distribution in the model.

Table 6. Computer predicted SAR in anatomic phantoms exposed to wireless communication devices (Normalized to 600 mW output power).

Frequency (MHz)	Brain SAR (W/kg)	Peak* SAR (W/kg)	Antenna Type	Authors Date
835	1.10	1.48	0.22-Wave	Gandhi et al.
	0.68	0.74	3/8-Wave	[1994] or Gandhi[1995]
900	1.13	1.37	1/4-Wave	Gandhi et al. [1994]
900	<1.38	1.38	1/2-Wave	Dimbylow & Mann [1994]
900	<0.54	0.54	Internal	Jensen & Ratmat-Samii
	<1.20	1.20	Monopole	[1995]
	<2.28	2.28	Monopole	
1800	<2.88	2.88	1/2-Wave	Dimbylow & Mann [1994]

*Peak SAR averaged over 1-g of tissue anywhere in the head, including the ear.

There are also computer calculations of SAR using simplified models of the human head and idealized antennas [Dimbylow, 1993; Chen and Wang, 1994]. Again, depending on the model selected for computation, the induced maximum SAR vary considerably from model to