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## **Cell phones and brain tumors: a review including the long-term epidemiologic data.**

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**BACKGROUND:** The debate regarding the health effects of low-intensity electromagnetic radiation from sources such as power lines, base stations, and cell phones has recently been reignited. In the present review, the authors attempt to address the following question: is there epidemiologic evidence for an association between long-term cell phone usage and the risk of developing a brain tumor? Included with this meta-analysis of the long-term epidemiologic data are a brief overview of cell phone technology and discussion of laboratory data, biological mechanisms, and brain tumor incidence. **METHODS:** In order to be included in the present meta-analysis, studies were required to have met all of the following criteria: (i) publication in a peer-reviewed journal; (ii) inclusion of participants using cell phones for  $\geq 10$  years (ie, minimum 10-year "latency"); and (iii) incorporation of a "laterality" analysis of long-term users (ie, analysis of the side of the brain tumor relative to the side of the head preferred for cell phone usage). This is a meta-analysis incorporating all 11 long-term epidemiologic studies in this field. **RESULTS:** The results indicate that using a cell phone for  $\geq 10$  years approximately doubles the risk of being diagnosed with a brain tumor on the same ("ipsilateral") side of the head as that preferred for cell phone use. The data achieve statistical significance for glioma and acoustic neuroma but not for meningioma. **CONCLUSION:** The authors conclude that there is adequate epidemiologic evidence to suggest a link between prolonged cell phone usage and the development of an ipsilateral brain tumor.

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