

# ALS

- Less common than AD
- <5.4 Million people worldwide affected
- Loss of voluntary muscle movement – deterioration of nerves of brain and spine
- Electrical occupations 5X as likely to develop ALS (Savitz 1998)
- Other observational studies with similar associations

## Mobile Phone Emissions and Human Brain Excitability

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**Objective:** To test—via Transcranial Magnetic Stimulation (TMS)—the excitability of each brain hemisphere after ‘real’ or ‘sham’ exposure to the electromagnetic field (EMF) generated by a mobile phone operating in the Global System for Mobile Communication (GSM).

**Methods:** Fifteen male volunteers attended two experimental sessions, one week apart, in a cross-over, double-blind paradigm. In one session the signal was turned ON (EMF-on, real exposure), in the other it was turned OFF (EMF-off, sham exposure), for 45 minutes. Motor Evoked Potentials (MEPs) were recorded using a paired-pulse paradigm (testing intracortical excitability with 1 to 17 ms interstimulus intervals), both before and at different times after exposure to the EMF. Short Intracortical Inhibition (SICI) and Facilitation (ICF) curves were evaluated both on the exposed and non-exposed hemispheres. Tympanic temperature was collected during each session.

**Results:** The intracortical excitability curve becomes significantly modified during *real* exposure, with SICI being reduced and ICF enhanced in the *acutely* exposed brain hemisphere as compared to the contralateral, non-exposed hemisphere or to sham exposure. Tympanic temperature showed no significant main effect or interactions.

**Interpretation:** These results demonstrate that GSM-EMFs modify brain excitability. Possible implications and applications are discussed.