

## How Electric Appliances and Tools Affect Pacemaker Function



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According to new research in the journal *Circulation*, the ability of pacemakers to regulate patients' heartbeats may be impacted by electric and magnetic fields (EMF) emanating from everyday household appliances and electrical tools. While holding the appliance or tool at a forearm's length distance (greater than 12 inches) can limit the risk of electromagnetic interference, researchers say further measures might be needed in environments with strong EMF, such as engines used in the manufacturing industry.

Andreas Napp, MD, study author and cardiologist at RWTH Aachen University Hospital in Aachen, Germany, says that harmful interferences with pacemakers are "rare" using vendors' recommended device settings. "Dedicated device programming is an effective measure to reduce the individual risk of interference. For example, doctors can reprogram pacemakers to a lower sensitivity to reduce EMF susceptibility," the author explains.

Pacemakers are small battery-operated devices that help patients' hearts to beat in a regular rhythm. For this study, Dr. Napp and colleagues tested under different conditions the impacts of EMF exposure on 119 patients with pacemakers. The patients were exposed to an EMF similar to common exposure, i.e., EMFs at power grid frequencies (50Hz or 60Hz), then increasing the EMF until the researchers noted a pacemaker sensing failure.

Test results indicate that pacemakers are susceptible to EMF that can occur in everyday life in particular when programmed to maximum sensitivity or so-called unipolar sensing mode. Examples of EMF sources are power lines, household appliances, electrical tools and entertainment electronics.

"Electromagnetic interference with pacemakers can result in bradycardia, or a slow heart rate," Dr. Napp points out. "The risk of interference depends on many different factors, such as the settings of the implant or strength of the field source. In occupational environments, such as the manufacturing industry, an individual risk assessment for workers with a pacemaker is required due to the presence of a strong EMF."

Source: American Heart Association  
Image Credit: University Hospital Aachen

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