

Cardiac Pacemakers and Residential Microwave Appliances

Public concern over the use of cardiac pacemakers in the vicinity of microwave ovens has been attributed to a reported incident in the early 1970's ⁽¹⁾. While the report generated much media attention and public controversy, it was later reported ⁽²⁾ that this original article had limitations and required careful interpretation. The article did not establish a clear link between the pacemaker and microwave "radiation" or determine the actual leakage level from that oven. Nevertheless, to help protect themselves from the perceived risk of liability it became common practice for many businesses and institutions to post signs warning people wearing pacemakers of the presence of microwave ovens.

Many electronic devices can be subject to faulty operation if not properly shielded to prevent radio frequency interference (RFI). While some very early pacemakers were designed without RFI shielding, most or all pacemakers manufactured since the mid-1970's include such shielding. A series of studies conducted to determine the maximum threshold of interference for safe operation indicated that newer models could withstand levels well above 1 mW/cm² ⁽³⁾. As a result, an editorial was published by medical professionals stating that the pacemaker interference issue "does not at this time constitute an important clinical problem." ⁽⁴⁾

Most or all residential microwave ovens manufactured since the mid-1970's are designed to limit microwave leakage to under 1 mW/cm². To ensure that this limit is maintained, the Underwriters Laboratories safety standard for microwave cooking appliances requires that microwave emissions do not exceed 1 mW/cm² from any point 5 cm or more away from the external surface under normal operating conditions ⁽⁵⁾. Therefore, the risk to pacemaker wearers in the vicinity of an operating microwave oven is almost non-existent since the emissions do not exceed the threshold necessary to cause interference.

Although UL standards have not yet been established for "microwave laundry appliances," it is anticipated that the same standards for emissions as are currently applied to microwave cooking appliances will eventually apply for microwave clothes dryers. Such appliances currently under development are designed with these standards in mind. Therefore, the risk to pacemaker wearers in the vicinity of microwave clothes dryers is no different than for microwave ovens.

References

1. G.R. King, et al, J.A.M.A., 212, pg. 1213, May 18, 1970
2. J.A.M.A., 214, pg. 1328, Nov. 16, 1970
3. J.M. Osepchuk, "Debunking a Mythical Hazard", Microwave World, Vol. 2 No. 6, Nov/Dec 1981
4. J.A.M.A., 227, pg. 1412, March 25, 1974
5. UL Standard for Safety, "Microwave Cooking Appliances", UL 923, Section 34.1, Aug. 10, 1990

