INTERFERENCE BETWEEN SURGICAL MAGNETIC DRAPES AND PACEMAKERS: A COMPARATIVE STUDY BETWEEN COMMERCIAL AVAILABLE DEVICES AND A NEW SHIELDED DRAPE

Authors: Chiasson H1, Zaphiratos V1, Drolet P1, Lapointe J2, Benzaquen B2, Fortier LP1. Maisonneuve-Rosemont Hospital, University of Montreal, Quebec, Canada
1 Department of Anesthesiology
2 Department of Cardiology

Background: Over 500,000 people in the United States have implantable permanent pacemakers (PMP) or defibrillators, and 115,000 new devices are implanted every year. Magnetic fields may interfere with the function of cardiac pacemakers. In the operating room, surgeons frequently use a sterile magnetic drape to hold their metal instruments while they operate.

Methods: We conducted a two-part study to evaluate the respective magnetic interference of common magnetic drapes and a new drape with shielded magnets with PMP. Following approval from IRB, 30 subjects with implanted PMP, were recruited for the first part of this prospective blinded trial. Under continuous electrocardiographic monitoring and cardiologist supervision, the commercially available drape currently used in our institution and a new shielded drape were applied in a blinded fashion to the chest area where the PMP was implanted. We looked for magnetic interference illustrated by the appearance of the magnet mode. Both drapes were moved and folded in an added effort to elicit interference. Following the pilot phase of the study, 20 more subjects were recruited to compare the new shielded drape to four drapes available on the market using the same protocol.

Results: From the first 30 subjects, 3 were excluded because the wrong control drape was used. For unfolded drapes, interference was observed in 17 patients with the commercial drape vs. none for the new shielded device (Fisher’s exact test p< 0.0001). When drapes were folded, two more patients (19/27) experienced interference with the commercial drape while 10 patients experienced it with the shielded drape (10/27), (Fisher’s exact test p=0.028). In the second part of the study, for the 20 subjects tested with 4 commonly available drapes and the shielded drape, interference was observed (drapes either unfolded or folded): Shielded drape; 0/20, Commercial 1; 18/20, Commercial 2; 5/15, Commercial 3; 3/20, Commercial 4; 1/20, Chi-Square; p < 0.001.

Conclusion: When applied unfolded on the participants, the new shielded drape did not create interference in any of the 27 subjects compared to 17/27 for the commercial drape currently used in our institution. Other commonly used drapes created interference at various rates. The practice of folding magnetic drape should be discouraged since all drapes can create interference with PMP in such circumstance.