tions or other auditory or visual disturbances that occur up to 20 minutes before the headache starts. According to Lawson, migraines are an electrical disturbance in the visual center of the brain, a phenomenon known as cortical spreading depression. This wave of neuron activity travels very slowly, causing the hallucinations or other warning signals, and when it reaches the front of the head, the headache begins. To prevent the headache, Fischell proposed trans-cranial magnetic stimulation (TMS), in which a weak electrical current is induced in the brain using a rapidly changing magnetic field, to prevent the propagation of the electrical wave. The patient would use the TMS device as soon as they noticed anything strange in their vision or hearing, and hopefully, the device would prevent the migraine itself. Lawson’s challenge was to cut down an existing 40-pound TMS device by 95%, to approximately two pounds. After several prototypes of the device, it was ready for clinical trials. Now Neuralieve, the company that took over the project, is working to get the device on the market, and Lawson has become a consultant for the project.

A second device, which is now in clinical trials, aims to make breast cancer surgery more convenient and cost-effective. In typical lumpectomies, where a tumor is removed from the breast, a mammogram has to be performed beforehand to identify the location of the tumor, and the surgeon often marks this location with a felt-tip marker. With Lawson’s device, however, a small magnet, 1 millimeter in diameter and 2 centimeters in length, is inserted into the tumor before surgery. During surgery, the device detects the magnetic field emanating from the tumor and makes beeps of various pitch depending on how close the pointer is to the magnet. This allows the surgeon to locate and remove the tumor quickly and accurately. The results of clinical trials so far have been promising. After the