

A long road to the Breast Center's new MRI

By **ERIC LEVIN**
of *The Montclair Times*

Glenn Hersh understood that buying a state-of-the-art magnetic resonance imaging (MRI) machine wouldn't be like hitting "1-Click" on Amazon. When he and his wife, Dr. Nancy Elliott, medical director of the Montclair Breast Center, ordered the nearly 12,000-pound GE Signa EXCITE 1.5-Tesla High Definition MRI system with Volume Imaging for Breast Assessment (VIBRANT) technology, they knew they were saying an almost \$2 million mouthful. They even knew they were signing on for an 18-month financial, logistical and regulatory flume ride.

What they didn't know was that the process would take 2 1/2 years and cost \$850,000 to expand the center's premises to house the MRI — almost twice Hersh's initial estimate.

Most of all, they didn't know that 10 feet would prove to be too far to walk to the bathroom. Satisfying New Jersey regulatory code on that score would be the thing that drove them up the wall — a wall for which they would need a variance from Montclair and an extra \$150,000 to build. Turns out the bathroom for an MRI suite has to be *in* the suite, not in an adjacent hallway, even if that bathroom is just 10 feet away.

In the spring of 2002, Elliott and Hersh, who is the center's chief operating officer, had set out to complete their vision of the Montclair Breast Center as a "complete breast hospital," as Hersh described it. Instead of a woman being bounced from specialist to specialist and waiting days or weeks for test results and follow-up appointments, the MBC's goal, he said, is to gather under one roof all the disciplines and technologies needed to speedily diagnose and treat breast cancer.

"Early detection can mean the difference not only between life and death but between chemotherapy and no chemotherapy," said Elliott. About 7,000 women are diagnosed with breast cancer a year in New Jersey.

The problem in early detection is that healthy breast tissue varies in density from woman to woman. Mammograms are not good at distinguishing between healthy breast tissue that is densely fibrous and malignancies, both of which look white on the X-ray film. An ultrasound scan can resolve the difference in many cases, Elliott said, but despite some false positives, the most definitive test is the MRI.

"That was the only thing we were lacking," said Hersh.

Getting an MRI machine is something like having a baby. There's more to it than meets the eye, and a lot of things have to be made ready before the new arrival

can be brought home.

Otto Von Eilbergh, a consultant to GE Medical Systems, supervised the installation of the MRI in the Breast Center's building at 37 North Fullerton Ave. Figuring out how to get a 6-ton, 8-foot-long cylindrical magnet into a room on the ground floor was the first challenge. Since the ceiling was too low to accommodate the magnet and all the wiring and vents and ductwork needed around it, the foundation had to be dug down about a foot to lower the floor.

The front of the building had to be opened up so the magnet — by far the biggest part of the system — could be slid into its new home. But since the front wall also holds up part of the three-story structure, supporting beams had to be installed around the opening before the wall could be removed.

MRI machines generate intense magnetic fields. The 1.5 Tesla rating of the MBC's unit creates a field about 30,000 times more powerful than that of the Earth. To reach that level, the wound wire core has to be cooled to within about 4 degrees Kelvin of absolute zero, which eliminates electrical

Staff photos by Adam Anik

DROP-IN: The 6-ton MRI magnet was delivered to the Montclair Breast Center last month for Medical Director Nancy Elliott, M.D., and her husband, Chief Operating Officer Glenn Hersh.

resistance and makes the wires superconductive.

Did anybody say humongous refrigeration equipment? No MRI can operate without it. Now, where to put it? The roof! So it's just a matter of building a false chimney to contain the "chiller" lines to get the cryogenic fluid — liquid helium — from the thermos-like structure of the magnet up to the roof and back. Not to mention the safety venting that allows the pressurized liquid helium to be released harmlessly in an emergency.

MRIs make a hammering sound as the magnetic field is manipulated. That required acoustic insulation of the room around walls, floor and ceiling. Vibration has to be damped as well. Then there are the radio-frequency waves that the machine generates to help the magnetic field create an image. These RF waves have to be contained in the MRI room. And the MRI itself has to be protected from moving metal objects, such as trucks and cars, passing near enough to disrupt the magnetic field.

Solution: Fully line the floor, ceiling and walls of the MRI room with thick copper. Then line it again with steel.

Hersh said he loved standing inside the gleaming copper room before the protective steel and the sheetrock and the wallpaper went on.

Two months in advance, Von Eilbergh arranged for a crane and

riggers, from a Brooklyn company that specializes in moving heavy medical equipment. The big magnet arrived last month on a flatbed truck from the GE factory in North Carolina. The control equipment arrived from another GE plant in Milwaukee.

It took about four hours to maneuver the magnet from the flatbed to the MRI room and position it on top of the floor bolts, level it and fasten it down. A one-story room had been added to the front of the building. Its roof was left open. The crane lowered the magnet through the opening, and after the magnet was slid into place, a temporary wood-panel roof was put on by the end of the day.

For the past month, an enormous amount of wiring and finishing work has been going on around the magnet. The MRI suite is scheduled to open in mid-January. The system makes a quiet chirp, chirp, chirp, like a chick in its nest, indicating that the cryogenics are circulating properly and that all is well. Yes, it's a 6-ton chick in a steel and copper nest, but Hersh and Elliott couldn't be prouder of their baby.

