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## Radiology Hits the Road

*Mobile radiology in rural America*

By Bob Stott

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The sun is barely holding onto the lip of the horizon when Brian's last patient – an old corn farmer with emphysema, who only lets the technologists call him "Colonel" – dresses himself and shuffles away from the imaging trailer and into a weathered pick-up truck that might be just as old as he is.

The buzz of scheduled patients and curious onlookers surrounding the trailer in the church parking lot at noon has died down to none at all. Almost suppertime, the main street is empty, and Brian can only hear the roar of crickets.

In the trailer, Jennifer shuts down the MRI system, packs away the extra equipment into drawers, and locks any moveable exam chairs and tables securely into place. Brad cleans away the leftover trash from the waiting room into the waste bin, and returns it to the closet.

From the driver's seat, Kelly calls back, "You guys ready to get out of here? It's 63 miles back to the hospital and I want to be home in time for 'Survivorman'."

Jennifer lies down on the couch in the waiting room, and is soon rocked to sleep by the motion of the trailer, rumbling down the deserted main street out of town. In the kitchen area, Brad makes himself some tea and settles into the recliner facing the window with his latest novel, watching the stars coast by in the dark.

### The Imaging Frontier

Far from urban medical centers boasting the latest innovations in medical imaging, rural towns seem neglected in the overall scheme of the imaging revolution, the flood of technology usually trickling down to these isolated populations last of all.

Many small towns scattered throughout the Midwest lack the sheer number of patients that would warrant purchasing the state-of-the-art imaging equipment found in urban facilities. Other small-town hospitals lack the facility space and funds needed for necessary renovations to upgrade their imaging suites to meet the emerging need.

Yet the demand for advanced imaging persists, especially with the gradual nationwide push toward electronic medical records and the explosion of American "suburbia".

As former farmlands outside of major Midwest cities continue to be transformed into housing developments, expansive outlets, shopping malls, and adjacent industrial parks, fewer people are returning to urban medical centers to maintain regular imaging appointments – a costly lapse in healthcare coverage.

With this demographic in mind, many medical centers and freelance services have initiated programs intended to bring state-of-the-art imaging directly to the patient.

While not necessarily a new idea, mobile imaging has experienced various leaps and bounds in the 30 years since its inception, and continues to find new niches in the imaging industry through which to reassert its valued mobility.

A few years ago, due to the advent of low-bore open MRI scanners, many healthcare experts expected to see the gradual decline and imminent disappearance of mobile MRI units altogether.



*@istockphoto.com/Jill Fromer*



*The mobile technologists for the mobile mammography unit for Methodist Medical Center (Methodist Medical Center)*



*A Methodist Medical Center mobile technologist uses the 'Mammovan' mammography unit. (Methodist Medical Center)*

However, the versatility of portable scanners and the continued expansion of populations away from better-equipped urban centers have allowed mobile imaging a vast frontier of applications to fill in the rural healthcare pitfalls.

### Familiar Faces in Town

Cutting through back roads without street signs and down seemingly forgotten highways, overgrown with thistle at the edges from irregular traffic patterns, today's mobile imaging trailers are becoming a recognizable sight at many of the little Midwest towns, tucked in between corn and wheat fields.

Rumbling into these rural communities on roads that are sometimes not even marked on a map, mobile technologists are finding something in these hidden villages that is missing from the daily contact of urban hospitals: a significant population without access to advanced imaging.

Working in coordination with local health clinics or churches, mobile technologists offer a specialty service that may not be available at the town hospital, or is not priority enough for townspeople to make the long journey to the better-equipped city hospitals or other urban healthcare facilities.

Bringing an ultrasound, MRI or digital mammography system into a town that tends to rely solely on X-ray imaging for a final diagnosis can open enormous potential for further analysis of a local patient's mystery condition.

"We have nine dedicated mammography technologists who all rotate on the 'mammovan', working together two at a time – six of the technologists have their Class B [Commercial Driver License] to enable them to drive the van," says Kelly Frick, RT(R)(M)(BS), the breast health navigator of the Central Illinois-based Methodist Medical Center.

Their mobile mammography units perform 2,500 to 3,000 mammograms a year with the van going out an average of three times a week to various towns throughout central Illinois.

Utilizing the GE Healthcare 2000D digital mammography unit on the Methodist mammovan, the technologists target an underserved female population that may be at heightened risk for breast cancer due to negligent screening protocols.

"We [also] offer grants through the Susan G. Komen for the Cure, as well as through the Methodist Foundation to assist uninsured and underinsured women in getting a mammogram," says Frick.

Imaging technologists are also common sights in the sprawling suburbs, setting up their mobile units in shopping mall parking lots, adjacent to small clinics or larger family physician practices, allowing scheduled patients a short drive and examination, as opposed to a day-long excursion into the city.

These endeavors by urban hospitals and local facilities to service a largely neglected demographic have prompted some of the larger suburban corporations, set up in the expansive industrial parks, to assist in the push for better imaging practices, investing themselves in their employees' lives and creating a tighter bond with the workforce.

"With our two diesel vans that go throughout the state, we work in just about every little hamlet in Oklahoma," says Larry Killebrew, MD, director of the Oklahoma City-based Oklahoma Breast Care Center.

"This mobility also allows us, for example, to visit a school and screen all the teachers, or a major corporation and screen all the women there. Working with small-town hospitals that don't have this technology often become the hub or the site where we go for screenings."

"Also, with large corporations, the employers like to keep their employees onsite if possible, because in order to get a mammogram, historically, a patient would take a day off work, whereas if we're on-site with the mobile vans, they could be done in 15 minutes. So, it's a dramatic cost savings, especially if the corporation is employing several hundred women."



*The waiting room inside the mobile mammography unit at Oklahoma Breast Care Center offers a warm, comfortable atmosphere. (Methodist Medical Center)*



*The mammography system on Methodist Medical Center's 'Mammovan' (Methodist Medical Center)*

### An Inside Look

While the population push away from urban centers has certainly done its part to spur on the efforts of mobile imaging, special consideration must be given to the advances made on both vehicles and imaging equipment design that allow technologists to reach these isolated residents.

Less cumbersome imaging systems made possible by built-in shielding, and a more durable trailer design, have allowed hospitals to bring specialty imaging – such as PET/CT and MRI – beyond urban boundaries, and still offer the same functionality as fixed-site systems.

However, the mobile imaging units also have to supply the basic comforts of a fixed facility to its patients, and set aside for the road-weary technologist a temporary home away from home.

“The van we use is 44 feet long and is, basically, a self-contained vehicle,” says Killebrew. “The technologists, if they go out more than 100 to 150 miles from the hospital, will frequently spend the night out. It’s not uncommon for them to spend the night in one of these towns where they will be doing the imaging, and either start back to the hospital in the morning, or continue imaging the next day.”

“And, the van we take out there is a large diesel van, with an interior design that reflects our primary center in Oklahoma City, so it’s very much like the patient is walking into our facility when they step into these vehicles,” he says.

While many hospital mobile imaging units operate significantly closer to the base hospital center, the same demands are made for comfort and convenience, for both the patient and the technologist.

Operating as an independent representative of the base hospital, the mobile imaging units are usually prepared for any number of demands made on them by the patients, from something as necessary as faxed copies of their medical records from a family physician to heating up some tea in the waiting room to relax them as they await the results of their scan.

“We only travel within 50 to 70 miles of the hospital, thus there are no overnight stays,” says Frick. “[However,] the van is equipped with a TV, stereo, microwave, refrigerator, copier, and fax machine. We also offer patients two dressing rooms and a couch in a small entry waiting room.”

One company, in particular, that has begun taking the mobile imaging industry by storm is Wis.-based OshKosh Specialty Vehicles, a manufacturer of specialty trucks and truck bodies for defense, industrial, and fire emergency applications.

Forging a name for itself during World War II as a builder of defense trucks, OshKosh has expanded its services to various fields requiring heavy-duty trucks, including jobs ranging from highway snowplows, to emergency rescue vehicles, to mobile military bases.

In 2006, OshKosh acquired AK Associates, a medical systems installation company, which had already spent more than a decade in the business of upgrading medical trailers for major medical equipment manufacturers, as well as shared mobile medical service companies.

Combining advanced mobile imaging installation with resilient truck designs to combat any number of environmental obstacles, OshKosh Specialty Vehicles has developed itself into a certified manufacturer of mobile MRI, PET/CT, catheterization laboratory, and mammography trailers.

With state-of-the-art imaging systems from Wauskesha, Wis.-based GE Healthcare, Malvern, Pa.-based Siemens Medical Solutions USA, Bothell, Wash.-based Philips Medical Systems, and Tustin, Calif.-based Toshiba Medical, the OshKosh Specialty trailer is designed to handle any number of mobile imaging requirements, as well as the capability to reach isolated populations in need.

### Bridging Healthcare Gaps

While major urban hospitals are usually the first to begin mobile imaging programs in order to reach satellite clinics and facilities in rural towns, the increased availability of freelance radiology services has also opened the market to independently owned imaging vehicles.

The growing availability of imaging vehicles has fostered opportunities with various private facilities where onsite imaging capabilities, without the added cost of installation, have unique benefits.

Businesses, such as Oklahoma City-based Mobile Coach Specialties, construct smaller, predominantly X-ray-equipped vehicles than many hospitals and competing services, catering to a very specific clientele – namely prisons and hospice care facilities.

Onsite X-ray services at prisons could eliminate the necessity in transporting injured prisoners to an imaging center, especially given the additional manpower that is required to do so, while mobile X-ray units at hospice care facilities do away with costly ambulance services and unnecessary ER visits.

Additionally, these independent imaging vehicles can assist overworked hospital imaging centers straining to meet their quota of patients, without the need for adding another imaging unit to the facility.

When rural hospitals accumulate the funds and the space to install a new digital imaging unit or initiate other upgrades to their imaging suite, there is still a considerable period of downtime when patient imaging will have to be outsourced to other hospitals, which is both inconvenient and costly to the hospital.

By contracting any number of these modality-specific vehicles, the hospital can forego transferring patients and losing its client base during the renovation period.

As the pace of medical technology quickens and urban medical centers are finding themselves anxiously pushed into the digital age, it would seem that there is a widening gap between rural and urban healthcare.

While experts may have speculated years ago that the emergence of mobile imaging would be a short-lived phenomenon, it appears that these businesses are making a sizeable niche for themselves, servicing an often unacknowledged population, offering them the same access to imaging resources as any city resident.

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