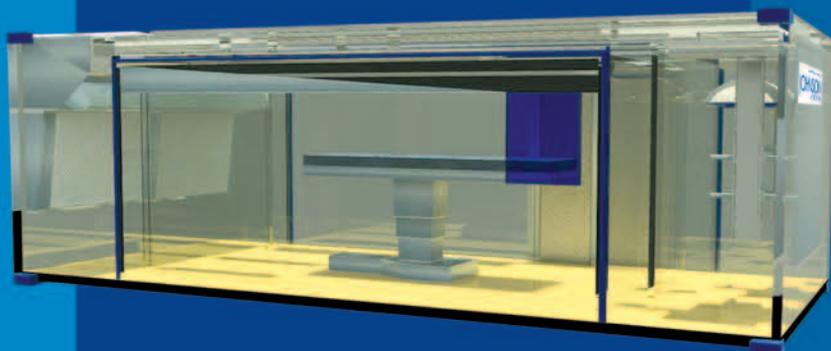
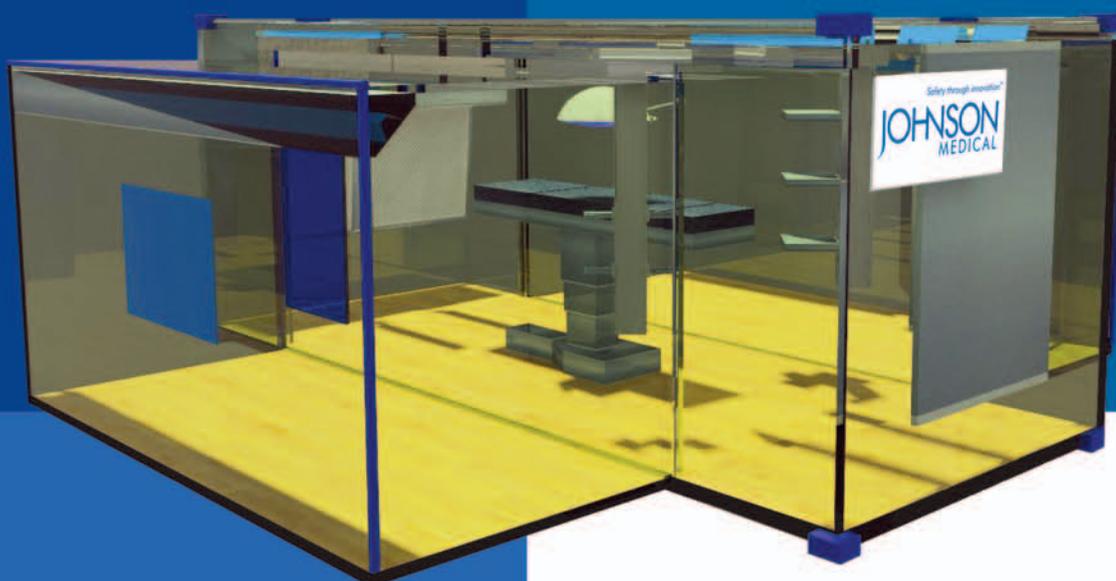
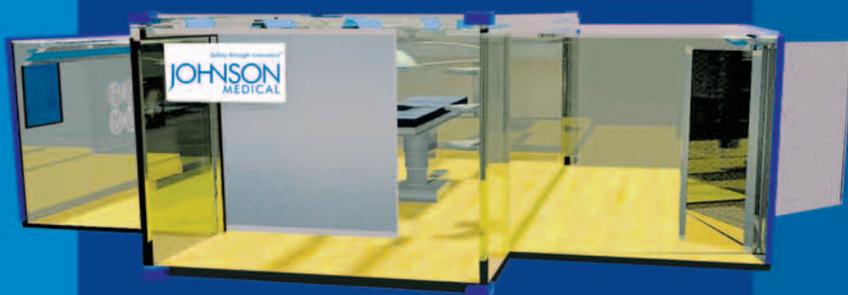


[www.johnsonmedical.com](http://www.johnsonmedical.com)



# Mobile, Modular & Expandable Healthcare Solutions



*Safety through innovation™*

**JOHNSON**  
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# Off-Site Engineering Solutions

Johnson Medical unveiled its mobile surgical unit in 1998. It was the first of its kind in the world at the time. It was promptly installed in one of the largest public hospitals in Kuala Lumpur. Today, Johnson Medical offers a whole range of mobile, modular and expandable healthcare solutions that include:

- 1) Offsite Engineering Solutions
- 2) Modular and Expandable Healthcare Solutions
- 3) Mobile Healthcare Solutions
- 4) Mobile Imaging and Diagnostic Solutions

## What the Press Said:

"Malaysia makes first of its kind mobile surgical unit"

- The New Straits Times, November 1998

"KL Hospital can now operate virtually anywhere"

- The Sun, November 1998

"Mobile Surgical Unit Makes its Debut"

- NST, Singapore, November 1998

"Mobile Operating Theater Unveiled - Units Can be set up in disaster areas"

- The Star, November 1998

"Manufacturer develops Asia's first mobile surgical unit"

- Hospital Product Asia, January 1999

"Free Wheeling Theaters - An innovation to bring care to rural areas"

- Asia Week, February 1999

"Surgery Goes Mobile"

- The Borneo Post, November 2000

"New OTs to ease Queen Elizabeth Hospital's backlog in surgical cases"

- New Sabah Times, November 2000



Undertaking the construction of a new medical facility, or starting major renovation works on the existing one, whether private or government owned, is always associated with a significant financial investment. In addition, a project of such a scale requires detailed planning and coordination of numerous contractors to ensure that the project meets the facility's needs, stays on schedule and within budget, and causes minimal disruption to ongoing operational activities.

When medical facilities embark on renovation or expansion projects, the usual challenges involved in design and construction are further aggravated by the risks associated with the existing building condition, the logistics of construction in a tight space and, often, continued occupation of the building or relocation during the course of renovation.

It is imperative, therefore, that such projects are managed to minimize costs and time of completion.

## Alternative Solution to Hospital Construction

The traditional approach to constructing a small hospital or a permanent hospital extension is to erect a concrete building. This is almost always a major and prolonged project, taking as long as 12 to 24 months to complete 5 operating theaters. The project management is very complex too, involving coordination of more than 10 different subcontractors including electrical, firefighting, air conditioning, piping, architectural, security, various medical equipment and medical gas suppliers. Often, these projects run a very high opportunity cost too.

By taking a container or cabin approach with Johnson Medical Offsite Engineering services, it is not only possible to reduce the overall cost but the lead time can be reduced by 70%. The offsite engineering modules from Johnson Medical can be built to accommodate any basic hospital service, from A&E and ICU to OT services. Several units can be linked together to form an entire department and a complete solution.

## Benefits

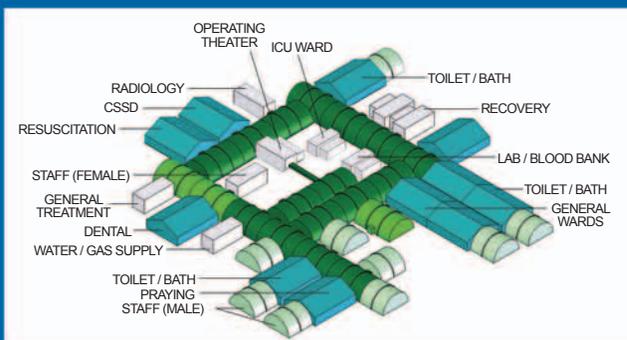
Benefits of using Johnson Medical Offsite Engineering Solutions instead of permanent hospital construction include:

- Full configuration and layout customizability to maximize total usable space and to cater for the facility's patient flow system while complying with required architectural layouts.
- Complete pre-fabrication of all modules to reduce installation at site, hence minimizing onsite disruption to operations, staff and patients.
- Significant construction-time reduction to decrease the revenue-impacting downtime.
- Minimal need for civil works to reduce pollution of the facility's environment and the obstruction of the existing facilities such as car parks.
- Easy facility extension by simply adding additional modules.
- A single contractor (Johnson Medical) takes the full turnkey responsibility for all architectural, mechanical and electrical works, making it easier for the facility to manage the project, and offering a peace of mind that a single expert is looking after all aspects involved in the project.
- Guaranteed compatibility of all fixed medical equipment.
- Capability to relocate a part or all of the modules to reconstruct the same extension in a different location.
- Simple warranty and service contract with a single vendor.

# Modular and Expandable Healthcare Units

Johnson Medical Modular and Expandable Healthcare solutions offer a unique combination of high performance, outstanding mobility, functionality, and superior customizability. Depending on the customer requirements, they can be built to suit different applications, such as becoming Mobile Field Hospitals and Temporary Healthcare Facilities. Both consist of mobile ISO containers that are docked together.

## Mobile Field Hospital



Natural disasters and war activities are at all time high with increased intensity and severity of human loss. Until now the solution has been to evacuate the injured and transport them to a medical care facility. Johnson Medical takes the opposite approach and utilizes its immediately deployable modular and expandable healthcare units to deliver high quality medical services to stricken areas.

Common users of Johnson Medical modular and expandable healthcare units are the UN, WHO, military forces, NGOs and all other organizations embarking on disaster and war relief efforts needing:

- Exceptional mobility for easy and rapid transportation to remote locations and across continents.
- Heavy duty durability and interoperability/integration with the existing structure.
- Modularity and the ability to operate independently.
- High demand for technology advancement and compliance to quality and safety standards and/or NATO conformity.

## Temporary Healthcare Facilities



Mobile OT Cabin

The priority during the renovation of any healthcare facility is to ensure that disruption to the day-to-day medical services is as minimal as possible. In addition, many hospitals today are operating at or above full capacity and therefore when they embark on renovation or extension projects, they cannot afford to vacate any areas. The result is that patients are usually sent to other hospitals in the vicinity, and at worst, the much needed renovation is postponed, often indefinitely.

By using Johnson Medical modular and expandable units, hospital services can be docked to the main hospital during the length of the renovation. This expandable module can host mobile OTs, ICUs/CCUs/HDUs, cardiac cath labs, X-ray rooms or A&E resuscitation areas. Utilizing these modules, hospitals can operate as usual, with no disruption to the patient flow. A prefabricated container-based hospital can be transported by trucks, tractor-trailers, trains, ships, planes or helicopters and can be easily assembled at site and dismantled for relocation.

All major procedures can be readily performed in an ISO container-based hospital. It is an autonomous system that maintains a complete medical infrastructure similar to the Johnson Medical Operating Theatre. Patients are guaranteed the same high quality treatment as they would receive from a conventional hospital.

The infrastructure of a Johnson Medical container-based hospital is fully designed according to ergonomic principles to reduce accidents, maximize usable space and ensure the comfort of the medical professionals and patients.

# Mobile Healthcare Units

One of the greatest challenges of developing countries in Asia is delivering basic healthcare services to rural populations, especially in scattered locations. Shortages of qualified healthcare personnel, high cost of construction and long periods of project completion have made building permanent healthcare structures unfeasible in many of these places.

The Johnson Medical Mobile Solutions host mobile clinics, dental units and mobile dialysis centers to provide a reliable and economical solution to this problem.

Our design concepts work around the following issues:

- The medical requirements aspect, which main contractors usually do not understand well.
- The ease and time factors necessary for transportation and re-location.
- The environment conditions such as weather, temperatures and humidity level of respective countries.
- Customer's key requirements, concerns and expectations, whether they address budget, safety, reliability, time, quality or equipment brand-preference.

The proposed layout is always congruous to all customers' needs. Depending on a customer's preference, the components and equipment can be sourced either locally or from international companies.

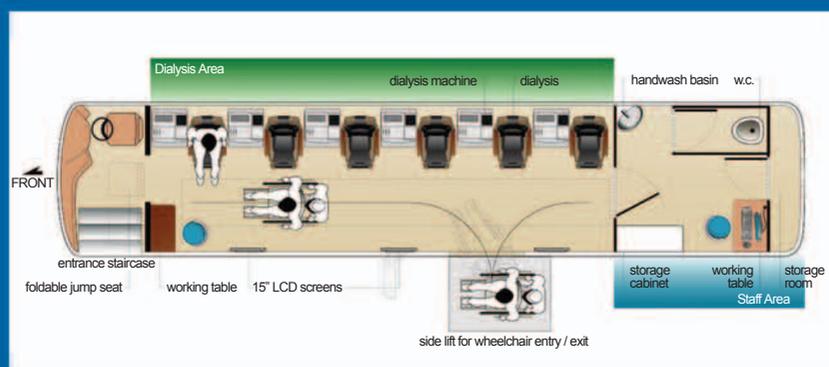
JM Mobile Healthcare Solutions are suitable for transportation in a variety of vehicles and ensure the comfort of the medical staff and the patients.



Mobile Clinic

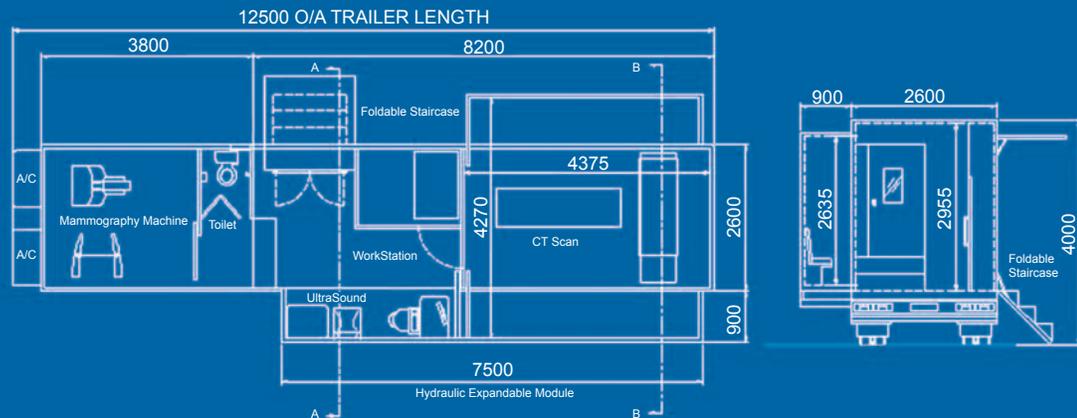


Mobile Dialysis Bus



Mobile Dialysis Bus Interior

# Mobile Imaging and Diagnostic Units



## Mobile Diagnostic Equipment

An increasing number of hospitals and group purchasing organizations have been contracting for mobile services that bring diagnostic equipment to hospitals, allowing them to outsource the procedures and avoid large capital investments.

With Johnson Medical Mobile Imaging and Diagnostics Solutions hospitals that do not have the patient demand to justify the investment in expensive, high-technology equipment—such as lithotripters, magnetic resonance imaging (MRI) systems, and cardiac catheterization laboratory equipment—necessary to provide a full range of services to the patients, can create "joint ventures" and share the capital investment in, and the use of sophisticated imaging and diagnostic solutions.

Joint ventures in mobile healthcare equipment help organizations cope with the increasing costs of technology, insufficient density of population in an area and the need for high quality medical care.

Our mobile and diagnostics imaging equipment is easily and safely transferable from one hospital to another in a specially designed trailer.



## Mobile Imaging Equipment

The increasing demand for digitization among hospitals and outreach facilities coupled with the high price of imaging equipment has also spurred the growth of the mobile medical imaging industry. There is a great demand for state-of-the-art mobile equipment for emergency rooms, out-patient departments and operation theaters.

Mobile equipment is gaining prominence in the field of computed tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET). A trend of deploying mobile imaging equipment, which is transferable from one hospital to another in a specially designed trailer, is also on the upswing.

# Offsite Engineering

## Solutions in Practice



**1** In 1998 one of the largest public hospitals in Malaysia had an immediate need for a mobile surgical unit to enable its main operating theaters at the accident and emergency department to undergo much needed renovations. Johnson Medical had developed the requested mobile surgical unit and installed it on the hospital grounds in under 6 months. The unit was subsequently used by the hospital's Emergency Services Department to temporarily host an additional operating theatre requested by the Malaysian government as a measure of extra vigilance during the hosting of the Commonwealth Games in 1998.

The unit, the first of its kind in the world at the time, featured a standard size operating theater providing a unique combination of high performance, rich functionality and high mobility. It incorporated several new patented designs to improve functionality and raise safety standards so as to be able to host very complicated surgeries.

Mobile surgical units can be manufactured using almost exclusively local resources. They consist of three separate ISO-size containers housing the main OT, separate induction and disinfection rooms and a store for sterile goods that are docked together using a specially designed docking channel to ensure a secure fit.

Container-based medical services can be configured to house X ray rooms, ICU wards, preparation rooms, etc.



**2** A leading private hospital in Kota Kinabalu, Malaysia was operating well above its capacity of 700 beds. The OT department consisted of 4 main OTs and a minor fifth. The entire department had suffered considerable wear and tear over the years, and was overcrowded with supplies and patients. A proposed new building extension across the road would provide 14 new operating theaters when completed but it could not be ready for 3-4 years.

Johnson Medical offered a container based OT approach to be utilized while the hospital was renovating its existing OTs and prior to relocating to the new building. Three new container-based operating theaters were successfully docked to the main building OT department on the second floor, in 6 months. This allowed for immediate decanting to ensure the existing OTs could undergo phased renovation without disturbing the medical services or interfering with the traffic flow around the hospital. Subsequently, the Johnson Medical mobile OT provided additional capacity to the main OT department.



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