



## Published White Paper

### ICRA 101: Tools for Infection Control in Hospital Construction, Renovation, and Maintenance

Infection Control is a key element in risk analysis for medical centers. Hospital Affiliated Infections (HAI) are a major problem as related by confirmed reports that you're more likely to die from an HAI than the initial reason you entered medical care. HAIs are a major focus of Joint Commission with hospitals and hospital contractors being familiar with the Infection Control Risk Matrix (ICRA) for Infection Control during construction, renovation, and maintenance. This work at medical centers presents an increased HAI risk because it allows contaminants into patient areas.

#### What is Infection Control for Construction, Renovation, and Maintenance?

Many factors come into play with infection control during construction. One of those is "dust containment". Dust and other materials from working in ceilings or walls can contain contaminants that cause HAIs. Simply opening a ceiling tile or wall may introduce contaminants to patient areas. Many procedures and products have been introduced. Each has various merits and short comings. The desired results are to protect patients from HAIs and make the containment of HAI contaminants have the least effect on maintenance and construction costs. Infection control is containing these contaminants and to making sure they are not introduced or re-introduced into the space.

#### The Evolution of Infection Control Tools

Infection control started with segmenting areas. Ideally segmenting off the area under construction would involve a fixed wall and separate air handling system. This process is still used in large areas where isolation for a longer time period is necessary. Separation walls and separate air handling units are effective but costly. Many general contractors figure in this cost to larger time consuming projects.

Segmenting using a "tenting off" process is applicable for smaller and short term projects. "Tenting off" an area is less costly, less time consuming, and does not normally support separate air handling systems. This process involves adjustable poles and plastic. Some configurations of build to suit tents are called ICRA tents. Again (similar to fixed wall solutions) this tent segmenting is labor intensive and expensive.

Many shorter duration construction, remodel, and maintenance tasks present an HAI risk similar to longer duration construction projects. Allowing the dust, dirt, debris, and its associated infection risk back into the patient space greatly increases the risk of an HAI. This has resulted in procedures that limit the amount of space that can be opened at one time (one tile per fifty square feet) and the amount of time it can remained opened. This has a positive result in reducing the overall risk but does not meet increasingly stringent regulations.

Initial developments used for smaller areas and shorter term tasks were "mobile tents or tents on wheels." This was an adaptation used by many medical centers and contractors as an attempt to reduce risk, comply with regulations, and become more productive. These portable containment systems collected the dust, dirt, and debris inside the tent for future disposal. These early products were initially soft vinyl or plastic units. Later some carts developed were called "dust buggies."

Infection control regulations (Federal, State and Joint Commission) then began requiring that the possible contaminates be captured and filtered out. These involved utilizing a negative air machine (NAM) attached externally to the tent or tent on wheels. This NAM contained a HEPA Filter to insure that 99.97% filtering of the contaminated air occurred prior to the air being reintroduced into the space. While this was a better solution, it was still labor intensive. The amount of labor required was significantly larger than doing the work without containment. Many leading contractors and hospitals note that the labor increased by a factor of 600 percent when comparing tasks with no containment and those using tent products.



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Many products and process developed around these tent products in the early 2000s. Several companies developed products that had strengths and weaknesses. The key needs of increased productivity and patient protection remained unmet. Many leading medical centers and contractors had to make tough decisions related to leaving ceiling and wall areas open for longer than the recommended amounts of time because the labor costs to perform simple tasks (testing duct smoke detectors, installing network cable, inspecting fire stops, etc.) greatly drove up their maintenance and construction costs.

### **Infection Control Priorities for Hospital and Hospital Contractors**

When asking contractors and medical centers for their priorities, they noted patient protection; labor productivity; Joint Commission regulations; rugged long lasting solutions; easy to clean; safe to use; electrically grounded to reduce static that can damage equipment and trap contaminants; third party filter integrity and air cleanliness (Class V air); and configurable to meet their specific set of tasks (electrical, mechanical, plumbing, etc.). Many of the available tools fit one or more of these needs, but most fell well short.

Most products offered in this market are made of soft or hard plastic. While plastic products may meet the Joint Commission requirements they are not a long lasting solution. Many users note the requirement to replace the soft tent "skin" portion of these products yearly. This product type's strength in being collapsible and easy to store is offset by the skin replacement; missing zipper, clips, and snaps; and the time spent setting up and moving. This adds extensive costs and labor. Cost and productivity are compromised. Add to this the static generated by moving air over plastic and you can be trapping contaminants onto the plastic instead of removing them via the HEPA filter. Contaminants then either must be removed by a vacuum process or they will be stored with the carts and could be later introduced into other areas.

### **Today's Tools for Infection Control**

Recently products were introduced into this market under the Dust Buggy or HEPACART names. These products are safe (made from aluminum with rugged welded box frame construction), easy to clean, and electrically grounded. Aluminum is light weight but strong and easy to clean with most hospital cleaners. Many second time purchasers of mobile dust containment carts have moved to these products because they meet their noted needs. The overall cost of ownership is lower due to their reduced time to move from spot to spot for short duration projects. Add this to the aluminum construction and embedded negative air machine and these products are a better long term solution to mobile dust containment during construction, renovation, and maintenance. Many users report these newer carts are so much more effective that they pay for their added cost during their first usage.

### **Job Specific Infection Control Tools**

Many options are now available for these new type mobile dust containment products. These options have resulted from the specific needs of medical centers and medical center contractors. These include pass through slips so cable, conduit, and tools can be passed into the cart without exiting; fire retardant curtain material for welding or soldering; lights; tool boxes; windows; laptop shelves; and various height curtains. Options with locking doors and tops are available for using the carts for storage similar to a job box or storing materials when not in use to maximize storage areas. Different size mobile carts including short models with end doors for more mobility and larger ones with wider profiles for mechanical and plumbing contractors are available. The varying models, configurations and options make each cart a better value to the user. Specific application carts vary for ceiling access versus wall access.



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### Infection Control Future

Infection control requirements for construction, renovation, and maintenance now can be met with new tools that meet the medical center and medical center contractor's noted needs- protecting patients and productivity. This market segment has moved forward significantly and a simple web search of dust buggy, HEPACART, infection control cart, and mobile dust containment will educate the user and let them make the most informed decision. From these developments will come more tools that focus on the need to protect both patients and productivity because the enforcement of infection control standards is increasing. The standards will become more strict. Infection control tools will continue to improve to meet the needs of hospitals and hospital contractors.

HEPACART Inc. based in Shawnee, Kansas (Kansas City metro area) is the leading manufacturer of high quality dust containment solutions for hospital construction, renovation, and maintenance. HEPACART offers multiple types of HEPACARTs with various sizes and options. HEPACARTs that provide only containment without HEPA filtering sometimes use the brand, Dust Buggy. All options developed by HEPACART were the direct result of a user's request to configure the cart that would make them most productive. Recent custom request like pass thru slips and multiple tile adapters are now standard options. Custom work is also available because productivity is one of our key goals.

HEPACART was developed from hospital work required by its sister company, TED Systems LLC. TED Systems provides security, access, video, fire alarm, sound, and nurse call products and services. TED Systems searched for a product that would protect patients, be efficient to reduce interruption to the hospital staff, and meet the labor schedule. All market products were evaluated- none met the criteria.

The result was the manufacture of our initial HEPACART.

HEPACART has since grown to various types, sizes, and options to better support our growing list of hospital clients and hospital contractors. HEPACARTs are in use at Massachusetts General Hospital, MD Anderson, children's hospitals in Chicago, Washington DC, Ft. Worth, among other hospitals in the United States and Canada.

"HEPACARTs protect patients and productivity." For more information about HEPACART Inc.

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Please consult the Infection Control Program for each medical facility for their specific infection control program, policies, and procedures.