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www.reachmd.com  
info@reachmd.com  
(866) 423-7849

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Disaster Preparedness & Daily Operations in the ER

## DISASTER PREPAREDNESS

Welcome to ReachMD's Medical Focus Series. This month ReachMD explores our nation's progress in Disaster Medicine and Public Health Preparedness.

Some 2 million people acquire bacterial infections in US hospitals each year and 90,000 of those patients die as a result. It seems the very facilities built to heal actually need to be treated themselves. Our guest today will explain how many recommendations for disaster preparedness may also improve daily operations and patient safety. You are listening to a special segment on disaster preparedness on ReachMD XM 157. I am your host Dr. Larry Kaskel. Joining me today is Dr. Mark Smith, Chairman of the Department of Emergency Medicine at Washington Hospital Center and Director of the ER One Institute.

**DR. LARRY KASKEL:**

Dr. Smith, welcome to the show.

**DR. MARK SMITH:**

Thank you for having me.

**DR. LARRY KASKEL:**

I know that you are the director of a project that is designing and building emergency rooms and hospitals that are disaster ready. Can you tell us a little bit about that?

**DR. MARK SMITH:**

Our location here in Washington DC makes us responsible for providing care in a city which is a prime target of terrorist attacks which solely suffered, of which two such terrorist attacks one on September 11 with the attack on the Pentagon and then another a month later with Anthrax attacks. Our hospital played a major role in responding to both; we were the busiest emergency department and the biggest

hospital actually by a factor of 3 in the District of Columbia. So this whole area of emergency preparedness is something that we have taken extremely seriously. In fact, our board of directors declared today a course procedure direction for the institution. I think we are one of the only hospital I know that has actually selected emergency preparedness and recognized its importance to the community that the hospital serves.

**DR. LARRY KASKEL:**

Mark, what are some of the innovations from this project that you think if were incorporated into newly built or renovated hospitals would really improve the operation of those hospitals?

**DR. MARK SMITH:**

I think it is important to ask how you conceive emergency preparedness, is it a kind of separate stream that you set up systems and open up and design spaces that are to be used only during a mass casualty incident or do you try to design spaces and put process in place that are also useful during daily operations as well and it is the latter the kind of doctrine of daily routine that we have striven so hard with direction to take for a number of reasons. First of all, it is very hard to justify spending lots of money on an empty space that is in use only, except in rare instance, it is also very hard to know that that space and those systems are going to work if they are not being constantly tested in the crucible of daily experience and so we have always striven for strategies to put into place designs and systems that are strong enough and robust enough to work during a mass casualty incident, but work and help out and are useful during day to day operations as well.

**DR. LARRY KASKEL:**

If we focus on infection control, what strategies and recommendations that came out of project ER One can help with that?

**DR. MARK SMITH:**

Well, the two key strategies there are one of a clear focus on ventilation systems and with attention to the number of negative pressure isolation room that you are building, our recommendation is that every room in the emergency department should have that capability of being a negative pressure isolation room. We are also conditioning the air coming in with hyperfiltration and UV light to make sure that any air that is re-circulated is not spreading contamination and that is something that is useful not only in the extremely rare a never event like small pox, but is also useful for regular influenza, for avian flu influenza, for multi-drug resistant tuberculosis. Another recommendation and we are testing out, and we think that hospitals need to pay a lot more attention to surface contamination with microbes, we know, for example, that one of the most serious hospital acquired or healthcare associated infections is *Clostridium difficile*, and we do know that those spores do exist and survive on surfaces and so we are looking at strategy to try to mitigate that, one of which is the use of antimicrobial or immune surface technology, copper or silver-impregnated coatings. We are actually testing that whether these do reduce the bacterial load. We do not know for sure they do, but we want to be trying it out and testing it out.

**DR. LARRY KASKEL:**

Mark, what about that old fashioned thing I heard of washing hands? I heard that helps.

**DR. MARK SMITH:**

Washing hands is the core foundation, but I think that like most things, things are multiply determined. We want hand washing with soap and water and hand washing with the antiseptic solutions that we have virtually in every room right now cuts things down dramatically, but if you have ventilation systems that spread disease then your hand washing will not be sufficient.

**DR. LARRY KASKEL:**

What about just private rooms instead of shared rooms in the hospital, not necessarily the emergency room?

**DR. MARK SMITH:**

That is clearly the trend now and I think virtually every new hospital that is being built is being built to the private room specifications. We still have a strong base of hospitals in this country that have a lot of semi-private rooms and it is one of these things that if your choice is between no care or care to semi-private room, we are obviously going to opt for care in the semi-private room.

**DR. LARRY KASKEL:**

Are there any studies that have shown that the extra costs of single rooms actually pay off?

**DR. MARK SMITH:**

They certainly pay off from a patient satisfaction perspective and I am not familiar with any that discuss the reduced spread of hospital-acquired infections by using single rooms as opposed to shared rooms, but there may well be that in the literature.

**DR. LARRY KASKEL:**

Mark, there are new rules coming out of Medicare, Medicaid, where they are actually making the hospital responsible for their mistakes. They are not going to pay for infections that are acquired in the hospital. Do you think your designs are going to help with that?

**DR. MARK SMITH:**

I certainly hope so. I do think though it is not just the facility designed that is required in order to reduce infection, there are two other things that I would call our attention to and are good examples of where systems that were designed to work in the mass casualty situation help the daily operation are in training systems and in our information infrastructure. So let us talk about training for a moment. Training is really the great unsolved problem in disaster preparedness because you are asking people to do things that they typically do not do during daily operations, may be use equipment they do not know how to use and take care of situations that they are not used to taking care of. So how do you solve that when there is basically no excess capacity in a hospital right now where there is staff turnover. We developed at our institution an online training system in its own learning management case that we developed for emergency preparedness. It was so successful that we at clinical department and administrative department <\_\_\_\_> for nonemergency situations

and as of last January there are 25,000 employees in MedStar Help which is the parent corporation of Washington Hospital Center. They switched to this learning management system that has robust capability, capability we built for emergency preparedness and now we are using in daily operations.

**DR. LARRY KASKEL:**

Well, I read an article in a recent Wall Street Journal that hospitals are using a SWAT team approach known as antimicrobial stewardship programs.

It is really a software program that really starts in the ER that takes into account all of the bugs in that hospital and the particular resistances in that hospital and gets everyone involved from the microbiologist, the Infectious Disease Department, the Emergency Room Department so they actually pick the right antibiotic and the computer actually tells them which one they can and so kind of avoids this kind of shotgun approach in the emergency rooms.

**DR. MARK SMITH:**

I think being cognizant of the particular resistance pattern that are occurring in your hospital as opposed to occur nationally because all medicine is local, strikes to me as something that would be very beneficial to patient care. I would also add, having a robust information infrastructure that underlines the infection protection, I think it is really important. We just for the process of sun shining data which sounds like the program you are describing is an example of can have tremendously beneficial effect. Just recently, we deployed a single information field that is on our hospital information system throughout the hospital that is maintained by infection control that tells everybody looking at it whether this patient has had in the past MRSA or C. diff and it has raised the level of alertness of the staff as well as the bed board people, the people making bed assignments, and our infection control director thinks that this is already in one month having an impact of having patients not being placed in rooms with other patients they should not be placed in and just by elevating and sun shining information through an information system, you I think can have a major effect because the hospitals are very complex systems.

**DR. LARRY KASKEL:**

When all the evidence is in, do you first see a design standard that will actually eliminate shared hospital rooms barring extraordinary hardships such as a natural disaster or terrorist attack?

**DR. MARK SMITH:**

I am not on any of the AIA Healthcare <\_\_\_\_> committees. As I said before, that does seem to be the way things are going and whether they get incorporated in standard, I suspect they probably will if they are not already.

**DR. LARRY KASKEL:**

What is the financial cost of really trying to raise the bar so you can be disaster prepared? Is it that expensive?

**DR. MARK SMITH:**

There is an incremental cost in this short run, but I would probably say that total cost of ownership and the total return in investment actually makes it a net plus in the end and not a net dollar minus.

**DR. LARRY KASKEL:**

Do you think all hospitals should be designed to that standard?

**DR. MARK SMITH:**

All medicines and local hospitals have to know what their own threat spectrum the hazard vulnerability analysis shows, but I think that by designing hospitals with scalability in mind with specialized capability in mind for the extraordinary situation, they can actually enhance their daily operations.

**DR. LARRY KASKEL:**

Let us talk a little bit more about the project on Emergency Room Department. It has been open for a while and have you seen a decrease in infection rates? Is it being measured?

**DR. MARK SMITH:**

Obviously, ER One Project has been open since April 1. It is a 10-room 20-bay extension, we actually had to compromise and put two patients in a room because of the pressure of patients that we have; we are the busiest emergency department in the nation's capital and we were letting the systems fail and we were about to start measuring. It is very difficult to get good data on infection. It is especially difficult to know whether people acquire an infection in the emergency department or not, so that we are going to be using surrogate markers for infection. We are going to be doing or swabbing countertops and walls and looking to see if the microbial load with the systems we had put in place is less than in our old space that has not had the same type of surface coverings there. We are going to be measuring things, but showing reductions of infection at least in the emergency department setting is going to be very very difficult to do.

**DR. LARRY KASKEL:**

If we move away from infection and just talk about communications, what have you done that actually has an impact in daily operations from the project ER One?

**DR. MARK SMITH:**

We recognize as I said the systems that almost always failed during these events are the information systems and the communication systems, and I will give you two examples of things where we were extending our current information system to provide a phenomenal communication tool and solve the family reunification problem. If the problem that families had say in New York on 9/11 when they would rush from hospital to hospital trying to find their loved ones because there was no central repository of who was in which emergency department. By combining that information, and we are going to be doing in the District of Columbia over the next six months and we are going to have seven hospitals contributing their emergency department data that the Department of Health or Department of

Human Services or District Government would be able to locate a patient for a family member in time of need. This is one example of information communication. Another is the whole problem of notification of how do you get notified that an event is occurring, people carry pager, they carry cell phones, they have a home phone, they have a work phone and we have just recently purchased a very elegant piece of middle wear that enables all of our staff to have all of their contact information placed and we can activate an access four or five contact numbers at once. This is something we are going to be using not only during the mass causality incident, but we are going to be using it in day-to-day operations by having people in contact groups and be able to contact folks in time of need whether there is no emergency or just a general announcement that there is a grand rounds going on, we think that is going to be very helpful.

**DR. LARRY KASKEL:**

Well, Dr. Mark Smith, the Chairman of the Department of Emergency Medicine at Washington Hospital Center and Director of the ER One Institute, thank you very much for talking with me today.

**DR. MARK SMITH:**

Thank you. It has been a pleasure.

I am Dr. Larry Kaskel and you have been listening to a special segment on disaster preparedness on ReachMD XM 157. We would love to hear from you, so please visit our website at [www.reachmd.com](http://www.reachmd.com) which features our entire library of shows with on-demand podcast. You can also reach us by phone now with comments or suggestion at 888-MDXM-157 and thanks for listening.

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