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# PATIENT-CENTERED HEALTH CARE

Within the healthcare sector we talk about solutions where you need reliable PCs with small footprints that are easy to clean with hospital detergents. The demand for medical PCs is increasing exponentially to meet the growing need for access to timely and accurate information. Advantech's medical products include medical certifications to meet specific safety requirements, both in terms of design (rounded corners), and electrical specifications (radiation and leakage currents). In reality, we go beyond the requirements. For example, designing isolated communication ports allows other devices to be connected to our medical products in a much safer fashion.

There is a growing trend in patient-centered healthcare. The bedside terminal is increasingly popular. Patients can surf the internet, send emails, make video phone calls, rent movies, or order meals. A stay in the hospital is more comfortable with better communications back home, especially important in countries where distances are too far apart for family members to pay regular visits. These terminals are also used by staff to access patient medical records like X-rays, monitor vital signs, and manage medications, while reducing errors and increasing efficiency. There is a lot to gain by improving efficiency, connecting systems and automating health care. Indeed, industry regulations are starting to mandate secure electronic patient records. As everything interconnects information becomes transparent.

With growing urbanization and an aging population, hospitals face handling more patients with fewer staff members. As such, it is a must for them to invest in automation and technology that improves efficiency and enhances services for patients and caregivers. Advantech cooperates with our "ECO" partners who write application software for patient monitoring, patient entertainment, and electronic medical records integration. We also work closely with our Alliance Partners like Intel® and Microsoft® on early development initiatives to quickly deliver the newest technologies to the market. Microsoft's Kinect technology has found a niche in rehabilitation centers and will continue to be adapted to other healthcare-related uses. Cooperative partnerships lead to quickly deployable, unique solutions.

Outside of Western Europe my team is also active in Eastern Europe, the Middle East and Africa. There are challenges to overcome in emerging markets with lower budgets and different thresholds for hygiene. In other markets, the need for digital healthcare may be understood, but often it is met with skepticism. And there are other markets looking for cost-conscious, inventive solutions, and best-in-design patient rooms. As always, Advantech will continue to build strategic partnerships, respond to the industry, serve advisory roles where needed, and deliver the best in services and solutions.

*Michael Bhagwandien*
Advantech Medical Sales Director Europe

# WIRELESS TECHNOLOGIES

## How they impact the future development of healthcare

*By John Koon, Publisher Medical Electronic Device Solutions*

The medical device market is heating up. The growth comes from the demand for services from the aging population and the ideas that healthcare problems can be solved by the fast changing wireless technologies worldwide. Three areas are gaining a great deal of attention and are experiencing rapid changes: Telehealth, (the concept of delivering healthcare services via telecommunication, sometimes called mobile health, mHealth or wireless health), Home Healthcare, and the use of handheld devices (iPhone, iPad, Android devices and the many versions of the Windows 8 tablet).

### Advancement of Wireless Technologies

The advancement of electronics in the last decade enables electronic design to be more compact, portable and easier to use. The smaller footprints of individual components, advanced manufacturing and packaging techniques enable medical devices to be very compact. Devices such as ultrasound units, insulin pumps, ECG monitors, blood pressure monitors and glucose meters are more portable than ever. Additionally, new wireless protocols such as Bluetooth, ZigBee, ANT and 4G further fuel the growth of new applications unthinkable before. Prevention and fitness has become a category all by itself with devices to monitor the conditions of athletes.

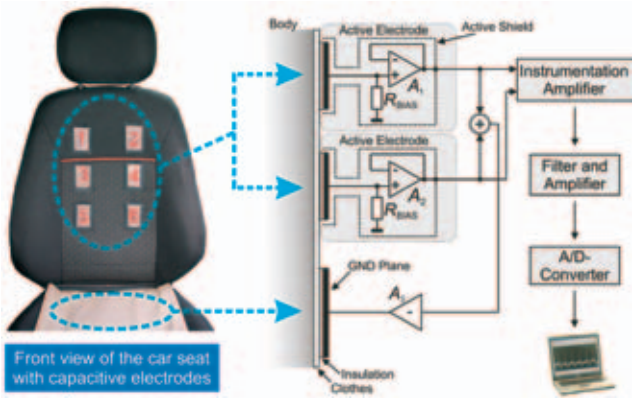
### Future Trends

### A. Telehealth, mHealth will grow at a rapid rate

Telehealth has become the wave of the future. Even in its infancy, more and more health organizations, including Highmark, Inc., one of the largest insurance companies on the east coast, are starting to use remote service to help patients cut down on doctor office visits and travel time. Developers are working on many new products to enable telehealth. One product is a remote stethoscope which will transmit the heart rhythm to the doctor remotely, allowing the caregiver to do basic diagnostics. Another product in its early stage is an iPhone with a special case design that turns it into an ECG device to measure heart rhythm. A caregiver can remotely receive and view the heart signals.

Multiple organizations including Qualcomm have been promoting the concept of wireless health and how it will enable "access" via mobile technology such as smartphones or other wireless devices, both in the USA and other countries. For example, Qualcomm initiated a program called Wireless ReachTM, which invests in projects that use mobile technology to benefit underserved communities by enhancing the delivery of health care and other areas such as education. Erica Whinston, Senior Manager, Wireless Reach™, Qualcomm, said, "3G and next-generation mobile technologies allow for connectivity anytime and anywhere. If harnessed appropriately, these technologies can be especially beneficial for remote communities that do not have access to the advanced health care that is available in urban centers."

Health monitoring is not limited to a fixed location. Ford Motor Company recently introduced Ford In-Car Health and Wellness which is a concept of health-on-the-go. The minivan equipped with a Ford SYNC AppLink has a built-in sensor in the driver's seat to monitor the vital signals of the driver. This information is transmitted via Bluetooth to the the driver's 3G/4G cell phone which connects with the caregiver.




▲ *Ford's In-Car Health System*

The Telehealth concept has transformed the practice of medicine. It has shortened the distance between the caregivers and those in need. "Access to services" is now a bit easier. Telehealth is expected to grow along with wireless technologies. Expect to see more connected healthcare devices come out. Note that devices will become smaller and more wearable, in some cases implantable. While access is easier, the need for reliable and secure end-to-end connection will remain a challenge.

## B. High-tech home healthcare will evolve

The wireless home healthcare market is expected to reach $4 billion in 2013 in the U.S. alone (http://mobihealthnews.com/7270/). So what applications make up the revenue? When a stroke patient is admitted to the Emergency Room (ER) in the hospital, the doctors will first attempt to save the person's life and keep him or her in a stabilized condition. The patient is now under observation to make sure there is no other complication. Depending on whether it is an Intensive Care Unit (ICU) or regular room, the daily cost can run between $500 and $10,000. So how long should the observation period be? If the patient is discharged from the hospital too soon, complications may occur and he or she will be readmitted to the ER again, a common problem today. The best solution is to proactively monitor the patient after discharge. Isansys recently developed a LifeTouch Patient Surveillance system which includes a compact, wearable ECG sensor/device which can be attached to the patient and allows the caregiver to monitor the heart ECG signals remotely.

▲ *LifeTouch ECG sensor*

The device communicates using the ANT protocol, with the nearby gateway unit connected to the internet. Other portable and home-use devices (for glucose/ blood/ oxygen monitoring) and ultrasound units are expected to grow rapidly and all these are contributing factors for the projected revenue growth.

Wireless technologies offer the aging population the chance to live independently with safety. For example, Grandcare Systems is a server (sometimes referred to as Point-of-care) connected to many sensor devices, which can be installed at a home via wireless communications including Bluetooth, ZWave and X.10. Depending on the configuration, the system can link with a blood pressure monitor, digital weight scale, motion sensor, mattress weight sensor, door sensor, pulse oximeter (by prescription only), and even a pair of shoes with built-in GPS. This comprehensive solution will be able to track and graph the day-to-day activities of the user and report to the caregiver an alert of any unusual pattern. The sleep pattern, blood pressure and weights are measured regularly; the system will know if the user locks the door or not as well as their whereabouts.

▲ *GrandCare Point-of-care system*

Other assisted living facilities may use an alarm system such as the Intel-GE Care Innovations' Link system. The home base station communicates with the wearable personal Link button via RF radio. When the senior needs help, he or she simply pushes the help button on the wearable unit and the caregiver will be informed of the request. A trained professional will provide a voice response via the home base unit.

▲ *Intel-GE Care Innovation Link unit*

Reimbursement is a very important part of healthcare. The paying parties such as the insurance companies and Medicare want to make sure the services are indeed performed before they are paid out or reimbursed. One of the reasons for CellTrak's growth is they offer a tracking solution to the healthcare professionals and agencies to schedule and communicate, making sure eligible services are paid. The solution provides a connectivity platform within the home that brings together various sources of data about a patient and ensures that the care to be delivered was indeed delivered. Expect more of these types of services to become available.

### C. Wireless technologies will propel use of mobile device in healthcare

Mobile Apps and the use of handheld devices in healthcare are growing rapidly. Many new applications are coming out that use smart phones to measure various vital signs including ECG signals and glucose levels

In the US alone, there are approximately 26 million people with diabetes costing $174 billion a year. Smart handheld devices including phones are used to manage diabetes. A smart wireless device that can remotely deliver insulin with accuracy to the body without a tube has also become available. Many more handheld smart devices will be developed in the upcoming years.

In terms of tablet use, the enthusiasm is equally great. The iPad already has many healthcare software apps today. Many medical schools actually use the iPad for their training and make loaners available from their medical libraries. While iPads seem to be getting all the attention these days, there are strong arguments that the Android tablet will be more successful in healthcare in the long run because of its open platform. Finally, another one to watch is the Windows 8 tablet, which has generated a great deal of interest in the healthcare market. Each platform will carve out its own niche in the market; the question is, over time, which will become the tablet of choice.

The use of tablets by doctors and patients in hospitals and clinics is expected to grow. More doctors are turning to tablets as the device of choice. Accenture, a leading consulting firm, predicts that tablets will become even more widely used in the healthcare environment over

time. Many patients complain that when they visit their doctor's office the time is short and they don't get the attention they deserve. They state that their doctors don't even look at them; during the visit doctors are busily entering data into their desktop computers. But this will start to change. The portable tablets enable doctors to face and interact with their patients while doing touchscreen entry. For patients, tablets allow them to enter personal information directly when they check in, which will save the steps of data entry normally required when converting data to the Electronic Medical Records (EMR). In some doctors' offices the tablets are stationed in the form of a kiosk similar to the systems used in fast food restaurants.

As more and more handheld devices become available, the need for seamless connection remains a priority. The reason that the iPad became a breakthrough product was because of its ease of use. Expect to see other tablets start to catch up. Finally, uses of wireless services will demand a more reliable solution. In a medical application, dropping calls is not acceptable. ■

## Conclusion

Wireless technologies in the medical device market will continue to expand in the next several years. Telehealth, home healthcare, and new use of smart handheld devices will drive the growth of healthcare in general. More devices will be connected together as reliable and secure end-to-end connection slowly evolves. Home healthcare will remain a fast growing market to meet the demands of our large aging population. And finally, point-of-care and handheld devices may go through what was experienced when the PC was first introduced—a lot variety and volume.

# KINECT EFFECT

## Reaches into hospitals and senior centers

**In the year since Microsoft launched Kinect for Xbox 360, the controller-free device has been adopted and adapted for a growing number of non-gaming uses, many of them in the healthcare field.**

**For the elderly, a fall is never just a fall. Marilyn Rantz's 80-year-old mother fell and broke her shoulder, and died within six months.**

"Falls lead to functional issues and other health problems, and can be a precursor to mortality," said Rantz, a University of Missouri nursing professor.

But what if technology could help prevent falls, and in some cases even prolong lives?

Rantz and her colleagues at the University of Missouri are researching just that, using Microsoft's Kinect to measure and monitor subtle changes in the gait and movement of older people. Using technology to measure the way people walk more completely and daily, can give healthcare professionals a chance to intervene sooner.

Helping seniors is just one of a growing number of healthcare applications for Kinect.

Doctors are using Kinect to help stroke patients regain movement. Surgeons are using it to access information without leaving the operating room and in the process sacrificing sterility. Healthcare workers are even using it to help with physical therapy and children with developmental disabilities or Attention Deficit Hyperactivity Disorder (ADHD).

"Honestly, what we know about here at Microsoft is but a tiny fraction of what is actually going on," said Bill Crounse, a medical doctor and Microsoft's senior director of worldwide health, referring to medical uses of Kinect.

Keen on encouraging the fast-growing wealth of non-gaming applications that have sprung up for Kinect, Microsoft released an academic and enthusiast software development kit for non-commercial projects in June and will release a similar kit next year for commercial uses.

Thus, the genesis of the so-called "Kinect Effect" – a term coined in the hallways and conference rooms of Microsoft to describe the device's increasingly widespread appeal and diversity of uses.

### Tiger Place

Tiger Place built by Americare, Inc., in cooperation with the Sinclair School of Nursing at the University of Missouri, is the first facility of its kind. It provides seniors with a place to live independently, but was also built with the intent to provide an environment for

interdisciplinary research to study aging and eldercare technology.

Several apartments in Tiger Place have a Kinect mounted near the ceiling in the living room, "With Kinect, we can gather – walking speed, stride length, step time, and we can see detailed trends over time to determine subtle changes and determine very early whether there is functional decline and fall risk," Skubic said.

The Kinect sensors were specially adapted for Tiger Place by Erik Stone, an electrical and computer engineering Ph.D. student at the university.

"Now, for $150, you can get a 3-D picture of the world. It's really rich, and it definitely moves things forward a lot more quickly than we were moving before," Stone said. "Based on the results we see, I think it's something we'll keep using."

Using Kinect and other kinds of sensors to identify functional decline can mean not only improving the quality of life of older adults, but may even extend their lives.

## Royal Berkshire Hospital

At the Royal Berkshire Hospital in Reading, England, stroke patients are using Kinect for Xbox 360 as part of their rehabilitation. One patient who didn't have much arm movement played Kinectimals, a game in which wild cats respond to being petted.

"The patient thought it was marvelous and we could actually see an improvement occurring, rather than the normal stretching and pulling a physiotherapist would do to the patient," said Malcolm Sperrin, director of medical physics at the hospital.

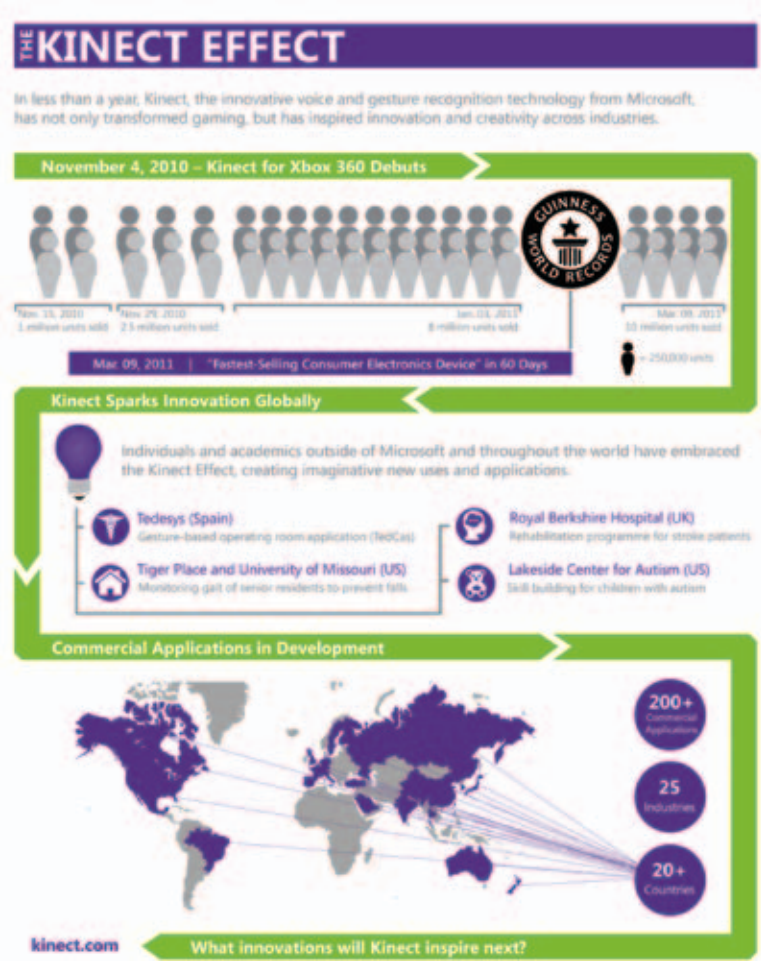
Another patient had problems with standing and full-body movement.

"We had him bowling," Sperrin said. "He was able to work on coordination between the twisting of his body and the movement of his hands, plus his eyes had to look at the screen rather than where his hands are.

"It's worked extremely well," Sperrin said. "One of the reasons we like the way it has developed, first of all it works for us off the shelf with no modifications at all, but it's also good fun so people can take it home and continue their work with family and friends and of course children – everyone can help with this self-directed improvement."

Microsoft's Crounse said the so-called Kinect Effect in the device's first year on the market is but a glimmer of what's to come, especially when it comes to healthcare. As Microsoft continues to deepen Kinect's technology, partners, researchers and even businesses will continue to find ways to adapt it for a veritable universe of healthcare-related uses.

*"This article, adapted from the original, appeared on the Microsoft News Center: http://www.microsoft.com/news"*




# HOW TO MAKE A SMART MEDICAL CART

## Streamline workflows

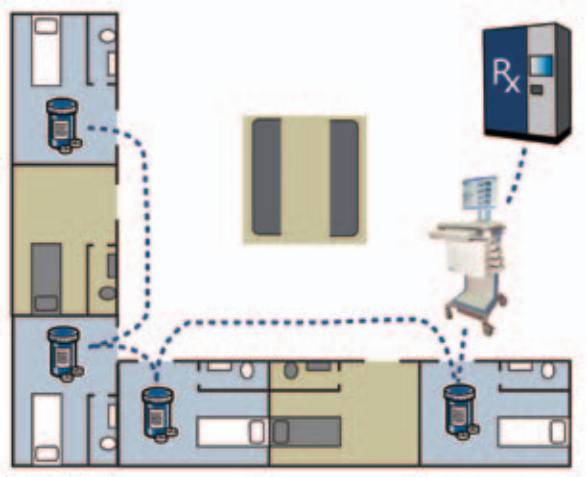
*Josh Dunbar, CEO of Elliott Data Systems, Inc.*

In today's changing healthcare environment, nursing and IT face many challenges in adapting technology and workflow. Both IT and medical staff are tasked with implementing new systems to meet deadlines, regulations, and create workflow efficiencies. These advancement in technology change the way that medical staff members work and present new opportunities to increase efficiency and patient safety.

The mobile workstation cart, sometimes called a COW (Computer on Wheels) or WOW (Workstation on Wheels), has become the default way to provide access to critical systems and information for clinicians in most hospitals. While there are certainly many types of devices that can provide access to hospital information systems, the mobile cart has become the tool of choice for many medical professionals. A cart by itself is not smart, but it does provide a simple and convenient platform to augment with clinical systems that allow input and retrieval of data.

So how do we make a cart SMART? First we have to look at the cart as a vehicle for change. While it provides access to clinical data, it also provides a good opportunity to revisit workflows that may be able to be streamlined based on the cart's form factor and features. Electronic Medical Administration Records (E-MAR) with barcode scanning is one of the best applications that can benefit from a SMART cart.

Many hospitals utilize a workflow of "one-to-one" for medication administration to patients. This workflow is typically designed so that a nurse retrieves medication for one patient at a time from the Automated Dispensing Cabinet (ADC) or med cart on the floor. The nurse then administers the medication retrieved and returns back to the ADC to retrieve the next patient's medication, repeating the process again. While the policy can certainly increase patient safety if followed exactly, it also creates many more steps and is very hard to enforce.



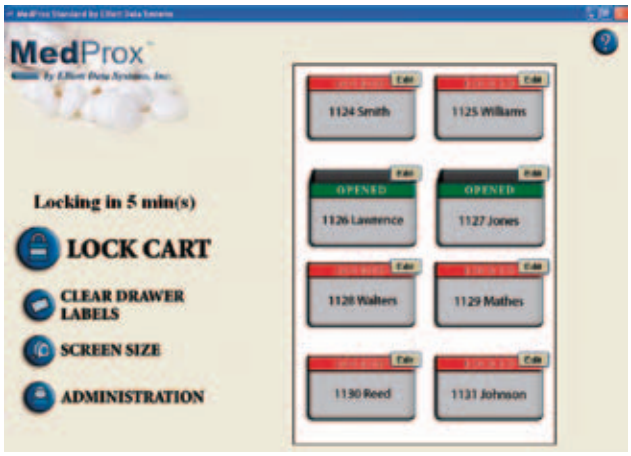
Adding medication storage to a cart can provide a basic platform to improve on the "one-to-one" workflow. Many carts can have some type of locking medication storage added to them. This creates an opportunity for clinicians to retrieve medications for multiple patients, separating and securing them until they reach the bedside. Such carts can bring additional challenges to the hospital. Medications prepped by nurses before entering a patient room might defeat barcode safety checks, and meds can also be left in a cart and not returned to a central repository after a patient is discharged or transferred. This is where SMART cart technology can make the difference over a cart with only a basic locking system.

The MedProx cart-based medication administration system is one way to take carts to the next level and implement SMART features. MedProx is an intelligent bin system that controls individual bins on a cart and can be paired with Advantech's AMiS mobile workstation carts. Since MedProx is an intelligent medication administration system, it tackles some of the challenges faced by moving medications to the patient using mobile workstation carts and provides the best platform for accountability, ease of administration, and an optimized workflow.

When evaluating mobile carts that may include medication storage, the following points should be considered:

- What type of locking system is on the drawers (Mechanical or Electronic)?
- Can user access be centrally administered?
- Can permissions and time outs be centrally administered?
- Can reporting be centrally administered?
- If the locks are software controlled, can they be integrated with Microsoft active directory?
- If the locks are centrally administered, does the system push data to the carts or does it use a real-time server based application?
- Can the system integrate with the hospital's information systems for advanced accountability?
- Can the system notify clinicians when a patient has been transferred or discharged?
- Does the system provide reporting to help enforce best practices?

These are all key features that go beyond just storing medications and allow SMART functionality, a truly efficient and accountable operation.




Typically the decision to implement mobile carts with medication storage is tied to another software roll out such as E-MAR or barcode bedside medication administration. These are very large and complex projects in and of themselves, and many times the details of mobile workstations and the workflow advantages they may create are not considered up front. In the long run, these features are important to higher barcode scanning compliance rates, meeting regulatory obligations, and enforcing overall best practices.

Smart medical carts such as the AMiS mobile workstation cart with the MedProx Intelligent bin system are transforming hospitals, improving efficiency, reducing errors, and making healthcare more patient-centered. ■

# A WORTHWHILE INVESTMENT

The main task of a hospital is to keep patients healthy. People want the best possible medical and nursing care. At the same time, a clinic is also a company that must work economically. French hospitals have gained higher profitability as well as an improved supply system with the MonAmi computer terminal from MaSanté. It is installed in a medical service table and is available for each patient at bedside. In this article, Alexandre de Jonge, founder of MaSanté and Kenneth Brown, Marketing Manager share their story.

An average 500-bed hospital in France generates a turnover of about 100 million euros per year. That's about 200,000 euros a year, or 548 euros per day per bed. Between 500 and 600 nursing staff members work in such a hospital. By doing the math, it is apparent there is one medically trained person per bed. Yet the reality is that they are available for only about eight minutes per day per patient.

## Time for Care

Doctors and nurses typically spend 30% of their time on paperwork. Regulations, prescriptions, laboratory results, and measurements or test results must be written down, transferred to other formats or forwarded. The normal workflow of a nurse includes about 25 pages of information per patient. Each of these pages must contain the name, the current date and some personal data of the patient. Much of it is written by hand. Findings and

measurements are obtained by working with the patient, and the nurses key this information into the computer at a later date. This additional step is a source of errors. All of these documents are important for maintenance and for billing with the insurance company.

## Liquidity

All services must be comprehensively listed for billing purposes. The performance records of the laboratory, station, practice, and pharmacy are collected and combined for each patient. For paper-based procedures, it may take some time until all documents are available for billing. It can easily take six weeks from the discharge of a patient up to the payment by the insurance company. These one and a half months equate to thousands of euros in unpaid bills and pre-financed services, and this affects liquidity which in turn accrues interest.

## Billing

Performance records are also often lost or not settled because they were not filled out completely or not promptly transferred to the computer for lack of time. However, no billing is possible without qualified, substantiated supporting documents, and this results in bad debt.

## Medical Treatment

Out of all laboratory tests, 30% to 40% are not available to the medical staff at the moment when they are needed. Sometimes the results are lost en route or delivered too late. The cost of the investigation is still incurred even when the result cannot be used.

## Effect of Medications

The effect of a medication can vary from person to person. Therefore, the doctor monitors how the patient responds to a drug and how his or her condition has changed. If the nurse administered the medication to the patient, the physician should assess the effect within a certain period of time. Each step contains many random delays and in everyday work, it is often not easy to be back at patient bedside at the right time. Medication must be ordered in the hospital pharmacy and delivered, at which point nursing staff can administer it and inform the doctor. But how can one ensure that this message gets to the doctor and is delivered in timely fashion?

## Fast Turnaround Increases Sales Potential

The number of beds in a hospital can rarely be increased. However, with an even utilization of all resources, further sales potential can still be gained. A comparable analogy can be made to that of a restaurant where theoretically 300 meals are served to 100 seats every night. The 300 servings can be attained only by quick turnover, when guests are efficiently served and promptly receive their bill after eating.

## Decisions and Actions with Relevant Data

Statistics and related parameters form the basis for decisions for clinic management. A manager can only directly intervene and control operations with information that is still relevant when it arrives. You can compare it to an airline. Six-week-old information about the late arrival of an aircraft is neither relevant for a short-term change in the flight plan nor for an update of the indicator panel.

## Acceptance of Computers in Everyday Care

Computers have long been in use in hospitals, but they don't always simplify the work of doctors and nurses. As a result, clinic staff members are often very skeptical of the introduction of computer technology and cognizant of the millions of euros invested which may end up as unused equipment sitting in the corner. In the past, disparate systems made life difficult: stand-alone solutions for each function, non-automated data exchange, incompatible or inconsistent components, long distances between patients and computers, complicated operation, and too many individual programs.

## Implementation

It often takes years until a computer-based technology is defined, purchased, installed, and ultimately applied. Each supplier is limited to its products, which must be assembled by the hospital IT department. It is largely unclear whether or not individual products will work together. During this process, some products may be discontinued or new versions issued. The result is a patchwork system. Compounding the situation is that, to date, there has not been a comprehensive software solution for all applications.

## Introducing MonAmi

MaSanté took the development of MonAmi ("My Friend") in an entirely new direction. Doctors and hospital staff were already involved in the outlining of the device. The requirements of the nursing staff, the everyday clinical operations and the available technical solutions were analyzed in detail. MaSanté built a comprehensive manufacturing project in MonAmi to offer a future-proof, high-performance complete solution. MaSanté organizes and leads a project team of component manufacturers, users, and distribution organizations, as well as combining core competencies across company boundaries. Advantech was selected as the supplier because they understood the potential of the solution for the healthcare market as the first terminal manufacturer, according to de Jonge, President of


MaSanté. "They really listened and implemented the ideas of our users in their products. Advantech is significantly better than the competition in this respect. The products are technically excellent; Advantech has the financial and technical resources and, thanks to their flexible and solution-oriented attitude, we are successful together," he said. MonAmi is more than a medical trolley with a built-in high-performance computer terminal. Behind the intuitive user interface are hidden complex access and presence controls; logistics; meal and medication ordering; geo-localization of patients, equipment and caregivers; patient entertainment; and an optional electronic patient record. All medical patient data is automatically merged for the patients across a network on MonAmi and the device is located at patient bedside. As a result, nursing staff has all medical information available exactly where it is needed. MaSanté developed a cross-system software platform. A user inserts the plug into one of the existing

connectors and can immediately start with their work. Invisible to the user, custom components are combined as needed to produce a tested and complete solution.


## Back to Core Competence Care

Since the computer is located at the bedside of the patient, administrative overhead is reduced for the nursing staff. MonAmi shoulders the burden creating more time for staff members to work with the patients. With the same staffing levels, costs can be lowered and at the same time the quality of care is improved. The key to this is the practice-oriented use of computers at the location of the activity and the automatic exchange of data.

### Increased Liquidity

With MonAmi, the processing time for billing is shortened because all data is immediately and automatically available.

### More Sales

With computer-based, decentralized and paperless recording, no supporting documents are lost. Thus, MonAmi will pay for itself within half a year, because increased data reliability and reduction of loss is reflected in gained sales. One to two percent of cost savings per patient is sufficient for MonAmi to generate a profit within six months.

### Improved Medical Treatment

Since laboratory and test results are directly transmitted electronically to patient bedsides with MonAmi, all available information is on hand for medical staff to make informed decisions. The reliability of the diagnosis increases, and the error rate decreases.

### Faster Healing

Medical examination after dispensing of a medication is faster because the doctor is informed automatically and immediately by the application. Medications are ordered automatically in the hospital pharmacy, at the precise moment when the doctor prescribes them. Patients with critical medical conditions are more closely monitored because information is delivered automatically to the doctor allowing for quicker response. Physicians engage patients directly, more frequently and in a more motivated way as all medical resources are available to them at the patient bedside. Research has also shown that patients spend less time in bed in treatment areas that include MonAmi. This is a positive side effect that the doctors very much welcome because it promotes faster healing.

### Shorter Hospital Stays

Improved care supports healing and the patient stays in the hospital for a shorter period of time. When the results of final tests are available, the patient can be discharged and go home. Automated transfers of data can reduce time spent in the hospital unnecessarily by up to one or two days.

### Better Acceptance, Faster Implementation

Intensive cooperation during the planning of MonAmi has reaped positive rewards. Doctors and clinic staff are seeing immediate benefits and are having fun at work using this practice-oriented device. With only a simple connection to existing wiring, MonAmi can easily be installed at all beds at the same time, even within a large hospital. The result is an even rollout, mitigating patchwork infrastructures and stand-alone solutions. ■


# ATTENTIVENESS, COMPASSION AND TIME

## Interpersonal Care Eases Hospital Stays

In the middle of a small forest near Frankfurt, in the town of Bad Soden is a hospital which is a part of the clinics of the Main-Taunus district in Germany. With 391 patient beds and 8 medical departments, it is a major hospital in the region. In 2011, nearly half of the hospital's patients were aged at 65 years or older.

"I have a great desire to make life a little easier for people who are not doing very well. Instead of just complaining about the world that is becoming ever colder, I would like to do something about it," explained Margret Groh about her commitment to the Green Ladies. The Green Ladies are volunteers who undertake small interpersonal tasks in hospitals, retirement and nursing homes that usually take care of dependents.

Thirty years ago, Margret decided to donate her time to care for the ill as a Green Lady. For nearly the past 20 years she has been leading a group, currently comprised of 22 Green Ladies at the clinics of the Main-Taunus district. "We go from room to room, introduce ourselves as Green Ladies and ask if we can provide anything," said the 77-year old.

### Bolstering Feelings of Security

Often these seem to be trivial things, like opening the yogurt cup at breakfast, peeling an orange, getting a glass of tea or a newspaper. The medical caregivers have little time because of their high level of administrative duties. Sometimes, however, a patient just needs a kind, helping hand.

The Green Ladies' visits offer much more than just practical assistance in the well-being of a patient's everyday life. Above all, the friendly care and personal attention imparts a feeling of security.

### Taking the Time to Listen

It takes a lot of empathy and a very keen sense of situational awareness from the Green Ladies to find out exactly what a patient needs. Quite often, a question or comment opens the heart and soul of a lonely person. Very personal conversations then develop. "Old people often have no one to speak to and we fill that role by listening," said Margret. "Many people don't grasp how valuable such attention can be. But we receive so much gratitude again and again. For me that is deeply satisfying and exhilarating," she said.

### Dealing with Emotional Challenges

It requires courage and strength of character to get so close to someone on one hand while keeping a professional distance on the other. Discretion is very important. The Green Ladies receive neither supervision nor professional help to deal with stressful stories, but they do offer support to one another. Monthly meetings are good opportunities for that. "When I started, I was relatively young. During that time, a walk through the forest helped me blow off steam. Today, I am able to leave a lot of the stressors at work when I leave the hospital. For the rest of it, I can relax at home with my husband and a cup of tea," said Margret about her experiences. Not everyone is suited for this work. Margret deals pragmatically with interested applicants. "If someone is interested, then I take them along on my rounds. Many people immediately realize for themselves whether or not they are suited to the job. You must be

able to openly approach people but not impose yourself. You need intuition for that."

## Continuous Growth

Green Ladies have been helping out in the hospital at Bad Soden since the opening of the clinic in 1970. Dr. Jörgen Schmidt-Voigt (1917-2004), the hospital's first chief physician and an active supporter of the Green Ladies, championed their start in the interior department. He had a profoundly humane approach to his profession. The scope of the Green Ladies has expanded over the years to cover the entire hospital and across all medical departments except the maternity ward. Initially, nuns working in the hospital were skeptical about the volunteers, but any initial difficulties have long since been overcome. "We do not interfere with the sisters' work and we ask before we offer help, for example to a patient who is eating," said Margret. Only a nurse would know if a patient is nearing a procedure and not allowed to eat. "We work closely together, because the nurses bear the medical and nursing responsibility and we are responsible for the human aspect," she added. Today, the medical care providers at the clinics of the Main-Taunus district are very happy that there are people who help patients overcome the fear and the feeling of loneliness. The district's website even gives specific mention to the Green Ladies.

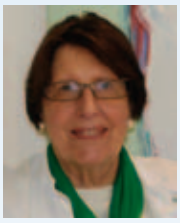
## A Model of Success

The success of the Green Ladies has led to many hospitals adopting similar initiatives. These volunteers offer a friendly and sympathetic smile, a willingness to listen, and attentiveness to the needs of the patients they serve. ■

## The Green Ladies of Main-Taunus-Kreis

**Margret Groh** — Former secretary. For 20 years, she has led the Green Ladies at the clinics of Main-Taunus-Kreis. She has created service plans and looks after the welfare of members of the group. At 77 years of age, she is far from quitting.

**Gisela Leonhardt** — 75-year-old volunteer last employed in the tourism industry. She was at the side of three friends through serious illness and death. The experience helped her grow, and she wanted to continue helping others. She has been with the Green Ladies a little over three years.



**Beatrix Grote** — Former medical technical assistant (MTA). She learned about the Green Ladies from a newspaper article. After her children left home, she found time to participate and has been a volunteer for the past 20 years. The 71-year-old feels very comfortable working in the medical field.

**Geneviève Benita** — French-born, she made the decision to help with the Green Ladies after seeing their commitment when she was hospitalized. She thought, "If I get healthy, I'll do that too." She studied German while working as a clerk, and now at 66 years of age, has trained in how to deal with dementia patients.

### Green Ladies - Information from Wikipedia

Green Ladies or Green Gentlemen are volunteers in inpatient hospital care. The name is based on the green tunics, which distinguish them from other employees at stations in retirement homes and nursing homes or clinics. Usually they undertake reading, shopping and other duties if relatives are absent.

The ecumenical hospital and retirement home help is Christian-inspired and spans church boundaries. Brigitte Schröder, inspired by the voluntary tasks of the Volunteer Service in the USA, founded the group in 1969. At the beginning of 2002, there were a minimum of 10,031 'Green Ladies' and 518 'Green Gentlemen' in 428 hospitals and in 286 retirement facilities throughout Germany.

# TRIPLE CROWN SAAD SPECIALIST HOSPITAL

## Advancing Patient Service at the Point-of-Care

The SAAD Specialist Hospital (SSH) opened in 2001. It is located in Al-Khobar, in the Eastern Province of Saudi Arabia and attracts nearly 5,000 highly skilled medical practitioners. Half of its staff have been trained in the west and are U.S., Canadian, or European board-certified. SSH has received a "Triple Crown" accreditation from three major international organizations: Joint Commission International (JCI); Canadian Council on Health Services Accreditation (CCHSA); and Australian Council on Healthcare Standards (ACHS). The hospital is well known for its leading edge solutions in patient care, and it continuously evaluates technologies to ensure it delivers world-class medical care to the 3.5 million residents it serves.

Recently the hospital devised a plan to revitalize its ICU area with an innovative idea for patient monitoring that would increase the efficiency and responsiveness of medical staff to patients while at the same time saving a lot of money in equipment needs and procurement costs. The system as they envisioned it would offer a long-term approach to centralized monitoring; but it was a complex solution that would require the right partner who could excel at delivering extensive technology customization and ongoing support.

Advantech was chosen to fill the role, and has formed a close partnership with SAAD Specialist Hospital by offering heavy modification of its point-of-care terminals. The project began with the Advantech POC-195 Point-of-Care terminal. SSH sourced individual hardware modules that were built to read CG, SpO2, CVP, ART and NIBP signals from specialized medical devices. With their operational know-how and medical experience, SSH was able to source the modules at a fraction of the cost of individual, standalone monitoring devices. SSH was

then able to leverage Advantech's unique customization capabilities. Advantech took its POC-195 Point-of-Care terminal and gave it a complete makeover from the inside out. Engineers worked with staff at SSH to figure out the most efficient module layout design based on SAAD's initial prototypes. The terminals were internally modified to house the modules supplied by SSH and the finished units had specialized I/O connectors to accommodate the new hardware. The finished product was sleek, and the point-of-care terminals met all the specifications for medical certification. SAAD Specialist Hospital completed this fusion of technology by adding a custom software interface to take advantage of the new modules. The result was an integrated "dashboard" which could connect to various pieces of equipment for central monitoring of patient vital signs and well-being. The dashboard gives health practitioners a single view of patient vital statistics. Once the system was ready, SAAD Specialist Hospital put it through its paces with a two month long lab and simulation test prior to placing it on the front line.

The project will save SSH an estimated $21 million dollars over three years. The POC-195 terminals are being installed in each of the hospital's ICU wards, with an Advantech POC-176 terminal with 17" monitor being made available at central nursing stations. SSH is planning to expand the scope of the installation by adding VESA mounted terminals with swing-arms in patient rooms, as part of its continuing efforts to improve and deliver the highest quality medical services available.

The new patient monitoring system shows the value of a strategic, focused partnership. Rudolf Holzhausen, Manager of Biomedical Engineering, and Project Manager at SAAD Specialist Hospital said, "The Advantech sales team and PM team are incredibly supportive! They have responded to all my requests and are very fast at providing solutions. They've proven that customer care is one of their highest priorities. Advantech have been the key to making this project run smoothly and I look forward to continuing and further developing our relationship with their sales and medical teams." The new system pays off in cost-savings to the hospital, in improvements in patient care and efficiency, and serves as a showcase of advanced and innovative technical solutions for other healthcare facilities in the region and throughout the world. The new system is in the process of obtaining FDA approval, which will mark a milestone, giving SAAD Specialist Hospital the first FDA-approval in the Middle East. This approval will serve as a springboard for launching the new platform to a worldwide market.

### Benefits of SAAD Specialist Hospital's New Patient Monitoring Platform:

- Increased response to patients; improved efficiency
- Integrated single-screen "dashboard"
- Cost savings of up to $21 million/USD over a three-year period
- Growth potential to expand platform to healthcare providers around the world
- Focused partnership guaranteeing excellence, reliability, and continuous improvements
- Experience to customize, manufacture, program, and deliver medically-certified systems

# Digital Healthcare

## Ensuring a Patient-centered Environment

### Technology-Enabled Patient Care Ensures Service Quality

Inspired by people-first technologies, Advantech's revolutionary medical care enables patient-centric solutions to enabling convenient, digitally enhanced healthcare services.

Many medical institutions around the world have benefited from Advantech's Digital Healthcare solutions, offering patients robust solutions that ensure precise clinical decision-making and facilitate quality care. The solutions effectively upgrade care quality and safety, and overall medical treatment satisfaction.

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