Hospital Blood Glucose Testing
Innovation with wireless connectivity
**Savings thanks to wireless connectivity**
Instant information availability enabling process optimisation and cost savings.
*General Hospital, Westküstenklinikum, Germany*

**Wireless connectivity means greater efficiency with less effort**
Automated data flow enabling staff efficiency and patient care quality.
*General Hospital, Stepping Hill, England*

**Wireless connectivity brings big benefits to a small hospital**
Ease of installation and maintenance enabling a small hospital to be as innovative as larger ones.
*General Hospital, Henri Serruys, Belgium*
Westküstenklinikum
Heide, Germany
700-bed general hospital
70 Accu-Chek Inform II meters
“Our goal is to keep patients here for as short a time as necessary” says Humayaun Kabir, Chief Information Officer at the Westküstenklinikum in Heide, Northern Germany, while discussing the importance that information technology (IT) plays in a modern hospital. At Heide, the CIO is tasked with a key role in process optimisation by helping improve internal coordination between departments. That involves making patient information instantly available to those who need it – one of the reasons that Humayaun and his team have installed a wireless-based network (WLAN) across the entire site.

Reasons for purchase
When it came to upgrading the Point-of-Care blood glucose monitoring system recently, WLAN connectivity was, therefore, a key requirement, which is why Humayaun and his fellow decision makers chose 70 WLAN-enabled Accu-Chek® Inform II hospital blood glucose testing systems from Roche. The hand-held devices are used throughout the hospital for Point-of-Care testing with test results being entered automatically in the patient’s medical record.

Process optimisation
Optimising processes extends across all departments in the hospital, beginning with patient care. At the bedside, nurses get blood glucose results within five seconds, a fact they much appreciate as Nursing Sister Lydia Plautz explains, “It means that nurses can react faster when they see that the patient isn’t well.” WLAN also allows nurses to focus on other tasks. With previous systems, data would get entered into the central database once the nurses had finished their round and placed the meter in the docking station. Lydia Plautz continues, “Knowing that the results are uploaded automatically is much more convenient. With the new system we can be confident that the data will be transmitted to the patient record without having to return the meter to the docking station while we concentrate on more important things.” The Accu-Chek Inform II system records the test result, the user and the exact time that the measurement was taken so the doctor can see not only what took place, but who conducted the test and when.

Workflow automation
With 700 beds and 200,000 out- and inpatients per year, making sure that the right information is recorded in the correct medical record is critical in ensuring that internal processes run smoothly. As Head Physician Professor Dr. Fritz Keck points out, “Medical staff doing the rounds at 2:00 in the morning can’t always ask the patient ‘What’s your name?’” At Heide, the Accu-Chek Inform II meter’s built-in barcode reader is used to identify the patient by scanning a barcode on a wrist bracelet, minimising the risk of wrong identification – a requirement of recent changes introduced by the German Medical Association. With WLAN, blood glucose results are automatically transmitted to the patient’s electronic medical record immediately or, if a wireless connection is temporarily inaccessible, results are stored and uploaded automatically when the device is in WLAN range again.
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**Work efficiency**
Along with uploading data to the central patient database, the Accu-Chek Inform II system’s quality control (QC) data is also sent via the wireless network. Quality checks are conducted by nursing staff, on the ward, who are automatically reminded when a control test is overdue. The QC data is transmitted to the central laboratory, where they are both monitored and stored. If a device reports a measurement outside the normal range, it’s automatically disabled and laboratory staff are alerted so that they can investigate the problem and take appropriate action. For Elke Henken, the Laboratory Technician responsible for quality control of Point-of-Care testing, this doesn’t just cut down on paperwork; she can respond much more quickly when she gets a ‘spot check’ from the testing authority. As she says, “It saves us having to go to each ward to collect the control data individually. Today the data is available centrally in the laboratory.” It’s much more convenient and saves time. Plus, there’s no more worrying when QC results can’t be found – saving a potential fine of €35,000!

**Cost saving**
At the same time as improving the lives of patients and hospital staff, the process optimisation is also helping to reduce the cost of patient care, as

**Time saving**
From a service point of view, being able to remotely identify problems wirelessly from the cobas IT 1000 system is saving the medical technicians time, too; they no longer have to track down meters or wait for a nurse to place it in the docking station. Nor do they get complaints from nurses about unconnected meters. Medical technician Jürgen Köhn explains, “From a technical point of view, WLAN gives us clear benefits in working more efficiently. We can use cobas IT 1000 application to find out what’s wrong with the device; we don’t need to go to the ward each time. With the previous system we would have to phone the ward and ask them to place the device in the docking station and hope that resetting the device would resolve the problem. The new system saves us a lot of time.”
Humayaun Kabir points out. “The average cost in Germany for a patient hospitalised with appendicitis, for example, is around €3,000. Here, it’s under €2,700 – more than 10% below the national average. We can only achieve that by optimising processes. That’s the reason we invest in technology in these areas.” Making patient information available faster through direct transmission of data across the wireless network from devices such as the Accu-Chek Inform II system is key to such improvements.

**Accelerated billing**

Getting data from Point-of-Care devices into the central information system rapidly is also vital for the hospital’s administration department as insurers require information on the patient’s DRG (Diagnosis Related Group) within 72 hours of admission. If the administration department doesn’t have all the necessary information available, then the process slows down. Without establishing the DRG, the invoice can’t be sent to the insurer. Since starting the process optimisation initiative, Heide has been able to speed up the billing process and turn the situation around. Invoicing is done daily and, because they can prove that their data is optimal, the insurance companies are obliged to pay promptly and in full, improving cash flow and reducing interest costs – a saving of €40,000 in interest charges in 2007/2008.

With IT playing a major role in speeding up the availability of data at the Westküstenklinikum the results are clear to see. Five years ago, the average stay for a patient was ten days. Now it’s down to eight. Being able to transmit blood glucose levels directly via WLAN with Accu-Chek Inform II system is helping Professor Dr. Keck, Humayaun Kabir and their teams reduce costs throughout the hospital and improve internal processes – an important factor for the Heide teams in meeting their next goal – reducing the average stay for patients by a further 24 hours to just seven days.

**Being able to transmit blood glucose levels directly via WLAN with Accu-Chek Inform II system is helping reduce costs throughout the hospital and improve internal processes.**
Stepping Hill
Stockport, England
850-bed general hospital
90 Accu-Chek Inform II meters
“We wanted a system that’s adaptable; one that not only fulfils our requirements today, but will still do so in ten years, as technology changes”, explains Point-of-Care Coordinator Sam Ekin while talking about the changes and, with them, benefits that she and her colleagues at Stepping Hill Hospital are seeing after installing ninety wireless-enabled Roche Accu-Chek Inform II hospital blood glucose testing systems. The general hospital at Stockport in the North West of England has been using wireless (WLAN) since 2005. Originally installed to enable medical staff on night duty to quickly download patient information, today WLAN is being used across the entire site for a range of purposes including computer networking and Point-of-Care testing.

**Reasons for purchase**
Previously, the hospital had been using manual handheld meters on the wards for blood glucose testing but concern about quality control had caused the Point-of-Care Committee at the 850-bed general hospital to look for a new system. Sam explains, “We did a risk assessment on how we were performing blood glucose measurement and the risk was considered to be too high. We were putting patients at risk because we couldn’t say if a meter had been quality controlled or not. With an electronic system, you have that proof.” With the Accu-Chek Inform II system, users must regularly perform quality tests or the instrument won’t allow a measurement to be performed. The quality data is recorded together with information identifying who conducted the test and is transmitted over the wireless network to Roche’s cobas IT 1000 Point-of-Care testing data management software, where it is stored for quality control purposes.

**Wireless reliability**
The hospital was the first site to install the Accu-Chek Inform II system and some staff questioned the security and reliability of using the wireless network for transmitting results. The ability to transmit results from the docking station of the Accu-Chek Inform II system via the Ethernet network was a reassuring safety factor. “The fact that the system is also hard-wired gave us confidence,” says Sam. Those initial concerns proved to be unfounded, however. “Based on what we know now, we would have been happy to use a purely wireless system.”

**Wireless, a key decision criterion today**
Although it wasn’t originally part of the hospital’s specification, wireless connectivity has helped save time and improve efficiency to such an extent that Sam is convinced it’s the way of the future. As she says, “Now that we’ve got it, we’ve realised that WLAN makes a big difference and it would definitely be a key criterion if we were making the decision today.”

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Sam Ekin, Point-of-Care Coordinator
Remote problem solving
One of the differences for the Point-of-Care Coordinator is in the way she deals with problems on the wards. Sam is responsible for all aspects of Point-of-Care testing from instruments themselves to staff training and support. Wireless means that she can help ward staff resolve problems faster. “90% of issues are user errors”, she explains, “but the system picks up problems, such as when an operator hasn’t applied enough blood to the strip. Because the information is instantly available over wireless, I can look on the system and can usually sort out problems quickly without the need for the instrument to be placed in the docking station. Compared with the old system, it means that I can resolve issues from my desk rather than walking to the ward.” With the time she saves, Sam can concentrate on providing additional support for the medical staff and patients, such as developing a new website with information and guidelines on measuring blood glucose levels.

Staff efficiency
Wireless is also helping Sam work more efficiently when changes in procedures are made or updates to the instruments are needed, as she explains, “If I make a change on the system, such as when we moved over to the new maltose interference-free strips recently, I changed the meter configuration on the cobas IT 1000 system and took off the maltose warning. I know that it goes out instantly and all the meters pick it up. Without wireless, I’d have to go round chasing everyone to ensure that they knew the change had been made. It makes it much easier. I don’t have to go out and find ninety meters to make sure they’ve all been docked.”
Helping to focus on patient care

It’s not just the Point-of-Care Coordinator that’s seeing the benefits of the Accu-Chek Inform II wireless connectivity; it’s helping In-patient Diabetes Specialist Fraser Burton work more efficiently, too. Part of the diabetes team of doctors and dieticians, Fraser takes the blood glucose results and interprets them, making clinical decisions on the results. That involves going round the hospital visiting patients with diabetes and ensuring that diabetes control is adequate. Knowing that the wireless network is providing up to date patient information, he can see what is happening with the patient’s blood glucose levels before he goes to see them. As he explains, “Having wireless and being able to see blood glucose results on the computer screen instantly was a great, but unexpected benefit. It means that I can prioritise my workload at the start of the day according to the needs of the patients.” Plus, once he is on his rounds, he can check to see whether a patient’s condition is deteriorating via any ward PC. In acute cases with poor diabetic control, such as diabetic ketoacidosis, where clinical changes need to be made quickly every half an hour, having the results available immediately via wireless is a significant advantage helping him and other medical staff administer optimum care at all times.

Part of a range of Roche analysers in use at Stepping Hill, including Urisys 1100® urine analysers, cobas h 232 cardiac analysers and cobas b 221 blood gas analysers, the Accu-Chek Inform II systems with their wireless connectivity have brought unforeseen benefits that are helping improve staff efficiency and the quality of patient care. As a result, Sam Ekin and her colleagues are convinced that whatever changes occur, with Accu-Chek Inform II they are well equipped for the future.

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Henri Serruys Hospital
Ostend, Belgium
331-bed multidisciplinary hospital
15 Accu-Chek Inform II meters
“Wireless works very well. You can use the meters all over the hospital and within five minutes the test results are available to doctors on their computers,” explains Laboratory Manager Dr. Suzy Van Erum as she talks about the reasons behind the choice of wireless (WLAN) connectivity when upgrading the hospital’s blood glucose meters recently. The 331-bed Henri Serruys Hospital in Ostend, Belgium has installed fifteen WLAN-enabled Accu-Chek Inform II hospital blood glucose testing systems. In use on each main ward, from maternity and paediatrics to geriatrics as well as surgical wards and intensive care, the instruments are connected to Roche’s cobas IT 1000 Point-of-Care testing data management software.

Wireless utilisation
Although it’s a relatively small, multidisciplinary hospital with just seventy-six doctors, Henri Serruys was one of the first in Belgium to install the WLAN-enabled systems and is leading its larger counterparts in the use of the technology to improve the quality of patient care. Initially used for prescriptions and bedside distribution of medication, the wireless network has been in use since 2008 and covers the entire campus, so the choice of a wireless-enabled device in Point-of-Care testing was a logical step. “The hospital’s positive experience with the wireless system in managing medication meant that we had no concerns with adding the blood glucose meters”, adds Dr. Van Erum, talking about the decision she and her colleagues made to introduce the Accu-Chek Inform II system.

Reason for purchase
Driven by new Government regulations to improve quality control in Point-of-Care testing, the team at Ostend were looking to replace older, non-networked blood glucose meters. Dr. Van Erum continues, “In the past, we used consumer style meters but there was no proper control. With the new regulations, we were obliged to bring the quality control into the laboratory. We looked for the best system and chose Roche.” Now routine quality control checks are conducted on the ward and results transmitted directly over the wireless network to the laboratory where they are immediately available, not only to laboratory staff but also for regulatory inspection.

Ease-of installation and maintenance
Having decided on Roche’s wireless-based system, the IT department became involved where, with
just five people in the IT support team, ease of installation and keeping support calls to a minimum are high on the priority list. Any concerns that IT Manager Manuel Eyland might have had quickly disappeared. As he explains, “We tested the device and it worked without any problems so we didn’t have any worries.” The complete installation of the entire

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Nurse, Operating the Accu-Chek Inform II system
Accu-Chek Inform II system, including the **cobas IT 1000** server, ADT connection and link to the laboratory information system (LIS), as well as configuration of the base units, took just two days and since then everything has run smoothly for Manuel and his colleagues. “We never hear anything regarding the **cobas IT 1000** application. When we don't hear anything, it’s always good for us because it means there aren’t any problems.” And, he continues, “as far as maintaining the wireless meters is concerned, it’s no different to maintaining devices on the Ethernet network. The wireless network is very stable and, apart from an occasional five-minute break for planned maintenance, it runs without interruption.”

It’s not just the IT team that are happy with the new systems. From better quality control of the instruments to immediate availability of results, the Accu-Chek Inform II system is providing benefits all round for the hospital’s laboratory management, nurses, and doctors. Now, the success that the team at Ostend have had with wireless-based Point-of-Care testing has prompted their colleagues at larger-sized hospitals to also evaluate the system and, as Dr. Van Erum says, “They are now planning to follow in our footsteps and implement the Accu-Chek Inform II system.” A clear example that small hospitals can be just as innovative as large ones!

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