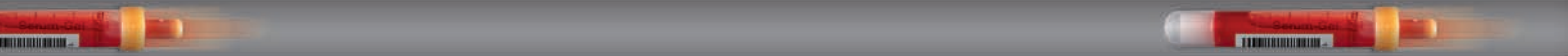


Tempus600[®] Case studies

Customer experiences



Sample Transport

Reliable, fast and safe alternative to conventional blood sample transport systems

The clinical laboratory of the Ghent University Hospital in Belgium decided to renew its existing automation, including in the pre-analytical part of the laboratory, and to expand the automation to include the post-analytical part of the laboratory.

The hospital needed fast, safe, and dedicated transportation system for blood samples. They decided to invest in the Tempus600® system because it was an ideal solution.

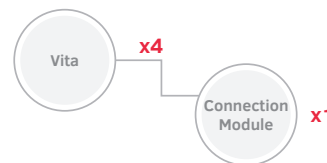
The system transports approximately 100,000 samples annually and has reduced the total turnaround time by approximately 15 minutes.

Four Tempus600® systems improve clinical laboratory workflow and efficiency

The hospital expanded its automation system because of the benefits, and in just one year, went from having one Tempus600® system to having four.

Two different transport systems complement each other

The hospital already has a conventional transportation system and the combination with Tempus600® has proven to be successful. Compared to conventional transport systems, Tempus600® allows the hospital to better control the process.



The challenge

The hospital needed a fast, safe, and dedicated transportation system for blood samples.

- Renew the core lab automation and aim for total lab automation
- Faster core lab service for emergency and Haematology-oncology department clinicians

The solution

Implement Tempus600® to automate the handling and transport of small clinical samples.

- Installation of one Tempus600® line as part of the total automation project; an ideal solution and opportunity to see its significant added value

The benefits

- Faster, predictable turnaround time
- Improved, automated workflows in the wards and the laboratory
- Reduction of peak loads in the conventional transport system
- Better control of the process



Ghent University Hospital, Belgium

- > Since its installation, we have only had positive experiences with Tempus600®.
- > Prof. Dr Veronique Stove, laboratory director at the Department of Laboratory Medicine at Ghent University Hospital, Belgium

Saving crucial time in the Acute Paediatric Department

In 2013, Kolding Hospital, Denmark, installed the Tempus600® system in their Acute Paediatric Department with the primary objective of speeding up the analysis of acute blood samples in the laboratory.

Today, all samples from the department are sent through the Tempus600® system. The system has been running 1200 samples a month since it was installed. Transportation time is only 40 seconds for acute samples, which results in savings of 30–60 minutes. This is a huge time saving factor and results in better treatment.

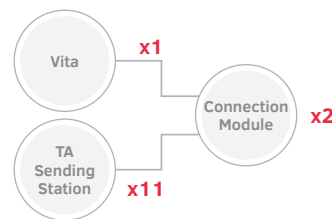
Small tubes are not a problem

At the Paediatric Department, the samples are collected in special micro tubes. The micro tubes are labelled with barcodes, placed in larger tubes also labelled with barcodes, and secured for safe transportation. These large tubes are dispatched via the Tempus600® system and placed into the

fully automated Sysmex/ GLP systems track, which registers and places them in a special output section. From here, they are handled manually in the microanalysis process.

Staff use Tempus600® to do the work

“The most significant impact on the staff’s daily routines is, that they no longer have to take the samples from the Paediatric Department to the laboratory several times a day, which is a return journey of 600 m. Now they can stay in the department, collect the samples and use the Tempus600® system to send them to the laboratory where the staff handle and analyse them” explains Jens Hastrup, Clinical Biochemist at Kolding Hospital



The challenge

To speed up the analysis of acute blood samples from the Acute Paediatric Department.

The solution

- Installing the Tempus600® system in 2013

The benefits

- Time saved on transportation
- Eliminate handling – saves time
- Risk of haemolysis is minimised



Kolding Hospital, Denmark

- > The main improvement is the speed and the fact that haemolysis is reduced because the samples can be transported much quicker than before.

> Jens Hastrup, Clinical Biochemist

One of the largest fully automated laboratories in Europe uses Tempus600[®] systems

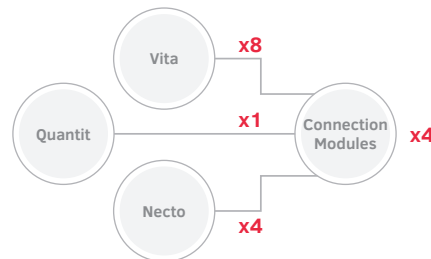
Since 2015, Bispebjerg Hospital has implemented thirteen Tempus600[®] systems – eight Vitas, four Nectos and one Quantit – that send the samples in an even flow directly to fully automated laboratory equipment. Transport takes just one to two minutes, and the fast, predictable transport times combined with the efficient analysis process ensure that the response time is kept under an hour.

Today, patients are treated and discharged sooner, with a better overall flow throughout the hospital. Clinical planning is also strengthened, because for more than 300 different types

of analysis, doctors in the specialist departments can rely on receiving results within an hour after the laboratory receives the samples.

Stable and fast response time

Transport takes just one to two minutes, and the fast, predictable transport times combined with the efficient analysis process ensure that the response time is kept under an hour



The challenge

Ensure higher quality for the hospital, with faster response times for analyses of the 10 million blood samples.

The solution

Install Tempus600[®] transport systems connected to the laboratory automation system.

The benefits

- Predictable and fast response times
- Faster diagnoses – all test results are delivered within one hour
- Better workflow and patient flow
- No need to prioritise tests.



Bispebjerg Hospital, Denmark

- > There is no longer any need to differentiate between Routine, Priority and Emergency samples, since all results for all priorities are available within an hour after arrival at the laboratory.
- > Helle Brunsgaard Larsen, leading biochemist at the Department of Clinical Biochemistry, Bispebjerg Hospital, Denmark

Fast transport of blood samples with better flow and response times

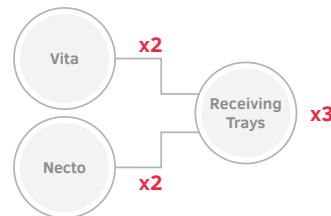
The Management of Laboratory Medicine Region Skåne at Skåne University Hospital decided to invest in a Tempus600® Vita and to trial a Tempus600® Necto as the solution to their automation needs for the handling, transport and analysis of small clinical samples.

Today, the turnaround time of analyses performed in the 24/7 laboratory is set to maximum two hours for routine samples and one hour for urgent samples. Response times for samples that are sent from the emergency department using the Vita directly to the laboratory are most often shown to be under

60 minutes, but now from the time the sample is drawn to when the results are ready.

A lot of walking back and forth and time saved

For years staff had to walk long distances with the samples, transporting samples in elevators from the sample reception and blood collection function situated at the ground floor. This has been eliminated with Tempus600® Vita and Tempus600® Necto



The challenge

Optimise the transport of samples from the emergency room and incoming samples from general practitioners.

The solution

Implement Tempus600® to automate the handling and transport of small clinical samples.

The benefits

- Effective control of high throughput of samples
- Improved workflow in the ward and in the laboratory
- Reduced response times
- Integration with other sample and IT systems for improved routines and processes



Skåne University Hospital, Sweden

> The benefit of Necto is that we manage large throughput and send the samples at an even flow, so that the laboratories receive the samples at an even flow.

> **Petter Hannerz, Business Developer/ Strategist, University and Regional Laboratories Region Skåne, Sweden**

Faster treatment of urgent patients, with fewer resources, is now a reality at well-known Italian hospital

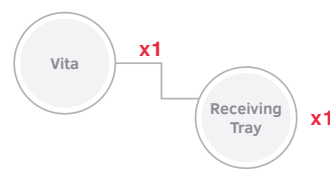
At Ospedale dell' Angelo – a brand new, high-tech hospital in Venice, Italy – management wanted to reduce patient waiting times in the Emergency Room (ER) and, at the same time, improve treatment with fewer resources needed.

The Tempus600® system was the solution to this challenge. Today, blood samples are sent directly, one by one, from the ER to the laboratory, speeding up the delivery, processing and the return of analysis results. According to Dr. Rosada, Head of the Emergency Room, the total turnaround time for blood samples has been reduced from 40 to 20 minutes with less resources involved. Staff must no longer carry urgent samples from ER to the lab – instead they can stay within their own department and take better care of the patients.

No time-consuming packing and unpacking of samples is necessary. The new innovative way of transporting blood samples replaces the handheld delivery that was previously

carried out by staff. Blood samples were collected at a single point and placed in a special container. The transfer took place when necessary or when the phlebotomist had the time to walk to the laboratory with the container full of test tubes.

“Basically, we save human resources because staff no longer have to spend time carrying blood samples to the laboratory. Consequently, doctors receive the test result earlier and there is less waiting time for the patients at ER,” says Dr. Rosada, Head of the Emergency Room



The challenge

To reduce the patient waiting times in the Emergency Room and, at the same time, improve treatment with fewer resources needed.

The solution

Installing the Tempus60® system in 2017.

The benefits

- Total turnaround time for blood samples reduced by 50 percent resulting in less waiting time for patients in Emergency Room
- Saves human resources because staff no longer have to carry blood samples to the laboratory
- Faster test results benefits the patients



Ospedale Dell' Angelo, Italy

- > The total turnaround time for blood samples has been reduced from 40 to 20 minutes with less resources involved. When doctors receive test results earlier, there is less waiting time for patients in the ER
- > Dr. Rosada,
Head of the Emergency Room

Efficient transport of blood samples ensures significantly faster analysis results

The time saving factor was the main reason for the decision to set up the unique pipeline, Tempus600®, at the Greifswald Universitätsmedizin hospital in Northern Germany in May 2014.

It really saves time – ultimately saving lives

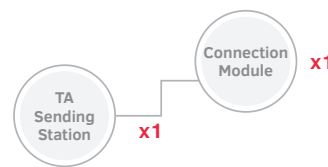
“The technicians do not handle anything from when the sample is taken at the emergency department. That cuts 30 minutes off the total time from when the sample is taken until the result of the analysis is ready” says the Laboratory Manager, Professor Dr. med. Matthias Nauck. He continues, “That’s really a significant time saving, leading to better and earlier decisions for the benefit of patients. Ultimately it could save lives.”

The first Tempus600® in Germany

Prof. Nauck became aware of the Tempus600® system through an article in a medical magazine. He became interested in the

remarkable speed of the system but could not understand that the samples did not require packaging. The sample tubes were simply sent in an ordinary rack.

“I contacted the manufacturer, Timedico A/S. Later I visited two Danish hospitals where Tempus600® had been successfully implemented,” says Prof. Nauck. “Our Tempus600® has been running 4000 samples a month since it was installed, and has proven highly reliable.”



The challenge

To save time on transportation of blood samples, which was earlier shared by two employees, from the emergency department to the laboratory.

The solution

Installing the Tempus600® system in 2014 – the first of its kind in Germany.

The benefits

- Significant time saved on transportation of blood samples
- Tempus loads directly into a bulk loader
- Tests show a superior quality of the sample compared with earlier procedures for transportation



Universitätsmedizin Greifswald, Germany

- > It cuts 30 minutes off the total time from when the sample is taken until the result of the analysis is ready.
- > Professor Dr. med. Matthias Nauck, Laboratory Manager

20 minutes after samples are drawn, analysis results are ready

A new internal transportation system has minimised the Emergency Room (ER) turnaround time for blood samples at Oulu Hospital, Oulu – the second largest hospital in Finland.

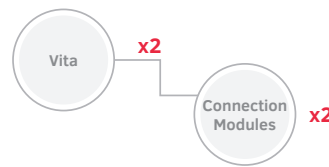
Rapid transport of blood samples has helped Oulu University Hospital decrease the patients length of stay in ER. Within minutes of arrival, blood samples are drawn and transported from ER to the laboratory, reducing turnaround time for crucial samples. This results in turnaround times of around 20 minutes from samples being drawn until receiving the results of the analysis.

“The clinicians were so happy about the results of Tempus600®, that they wanted to buy their own system for the ward. This is absolutely the best feedback that you can get from your colleagues.” says Tiina Lehto, Clinical Biochemist, Joint Municipal Service Provider of Northern Finland Laboratory Centre (NordLab).

Smooth progress of transition

When the laboratory management heard about the Tempus600® solution, they went to Denmark to see how Tempus600® works. They were pleased with the efficiency of the system and, in 2016, hospital management decided to invest in the Tempus600® Vita.

“The installation was on time. The supplier promised to install the whole system within 2 weeks and they completed the installation as promised. Everything went smoothly, there were no delays and we were very happy about the entire process.”, says Tiina Lehto.



The challenge

To decrease the patient's length of stay in Emergency Room.

The solution

Installing Tempus600®, a lightning fast point-to-point line dedicated to the transport of blood samples. This results in turnaround times of around 20 minutes from samples being drawn until results of the analysis are ready.

The benefits

- Reduced turnaround time of around 20 minutes decreases the patient's length of stay in ER drastically Supports Lean Thinking through better workflow and improved processes and procedures
- Faster and gentler transport than with traditional Pneumatic Tube Systems



Oulu University Hospital, Finland

- > Now our colleagues want to buy their own system – that is absolutely the best feedback you can get from your colleagues
- > **Tiina Lehto,**
Clinical Biochemist (NordLab)

A fast and simple solution that saves precious time

“It is a brilliant system and was very easy to install in our existing hospital, connecting the ward to the laboratory by means of a small pipeline” explains Gunn Sjurseike Dale, manager Medical Biochemistry, Stavanger University Hospital in Norway.

“Furthermore, it is a good and simple solution compared to traditional PTS systems because it saves time by not having to pack and unpack the blood samples.”

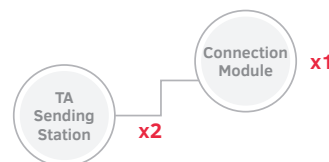
New working routines

Before, the phlebotomist used to carry the samples to the laboratory having finished their round which normally takes 2 to 2.5 hours. Now they can send the blood samples continuously one by one as the samples go directly to the laboratory and receive analysis results faster.

“Tempus600® fits perfectly with the Lean Thinking that we work with at Stavanger University Hospital and this has helped staff to understand the brilliance in sending the samples immediately to get faster analysis results.”, says Gunn Sjurseike Dale.

Treatment can begin sooner and patients can be released earlier

“By changing the process of blood collection, the total turnaround time has reduced dramatically and the treatment of the patient can begin sooner. Patients can be treated and sent home earlier.”, Gunn Sjurseike Dale says: “We find that the quality of the samples is better when transported by Tempus600® system, compared to transporting the samples the traditional way.”



The challenge

Achieve quicker response time for blood samples in order to improve patient care.

The solution

Installing two Tempus600® centrally in two hospital buildings. In the laboratory the samples land in a SARSTEDT bulk loader which automatically distributes the samples on the track.

The benefits

- Reduced the transportation of samples to the laboratory from 2–2.5 hours to less than one minute meaning treatment of patients can begin sooner
- Evens out production in the laboratory
- Supports Lean Thinking and results in improved workflow
- Easy installation in existing building



Stavanger University Hospital, Norway

- It is a brilliant system and very easy to install in existing hospitals. It has helped us reduce turnaround time dramatically and we can start patient treatment sooner.
- Gunn Sjurseike Dale, manager Medical Biochemistry department

Rapid transport of blood samples reduces response time dramatically

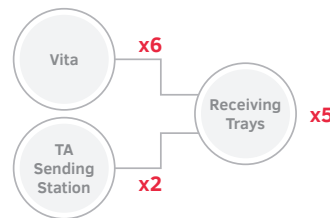
In 2015 Ramathibodi Hospital, a leading public hospital in Thailand, decided to invest in two Tempus600® systems for transporting blood samples. The hospital needed to bring down the total turnaround time (ToTAT) and reduce the amount of inpatient bed days.

This was essential because of the large number of patients being treated in the hospital every day.

Two Tempus600® sending stations were installed in one of the main Health Service buildings sending blood samples from two different levels directly to the laboratory located in the Main Building.

Now every sample takes less than two minutes of transportation instead of 45 minutes previously used by porters.

With the total turnaround time reduced from 85 minutes to 45 minutes because of Tempus600®, the patients receive better treatment and return home earlier.



The challenge

The three main Health Servicing buildings service at least 5000 outpatient visit per day and there is more than 1000 beds for inpatient medical care. The Ramathibodi hospital wanted to bring down the total turnaround time for blood samples and reduce the amount of bed days.

The solution

In 2016 two Tempus600® sending stations were installed at the hospital and following the success of those, two more were installed in 2017.

The benefits

- Sample transportation time is reduced from 45 minutes to a maximum of 2 minutes
- Total turnaround time has been reduced from 85 minutes to 45 minutes, leading to achieving target Lean goals
- Amount of bed days have been reduced



Ramathibodi Hospital, Thailand

- > The transportation time of blood samples has been reduced from 45 minutes to a maximum of 2 minutes

Swift transportation of samples speeds up turnaround time for urgent test results

When Homerton University Hospital NHS Foundation Trust, based in the London Borough of Hackney, identified problems meeting turnaround times on urgent test requests from Accident and Emergency (A&E), the solution was to install the rapid transport system Tempus600®.

Since the introduction at the hospital, the Tempus600® transport system has had a considerable impact on laboratory turnaround times which, in turn, has had a positive effect in breaches of the four-hour waiting time in A&E due to diagnostic delays within pathology have become almost non-existent.

Quick and easy transmission

Implementing the system into the daily work flow was a simple transition. Staff quickly became used to the system and they made very few mistakes. Therefore, it was possible to continue the normal day-to-day services whilst implementing the new routines.

“The system itself is fairly intuitive – users need very little training and maintenance is minimal” says Colin West, Head of Diagnostics at Homerton University Hospital



The challenge

To meet turnaround times on urgent test requests from Accident and Emergency.

The solution

To install the rapid transport system, Tempus600®, dedicated to quick transportation of small clinical samples.

The benefits

- Reduced turnaround time on blood samples
- High quality samples
- A good investment



Homerton University Hospital, UK

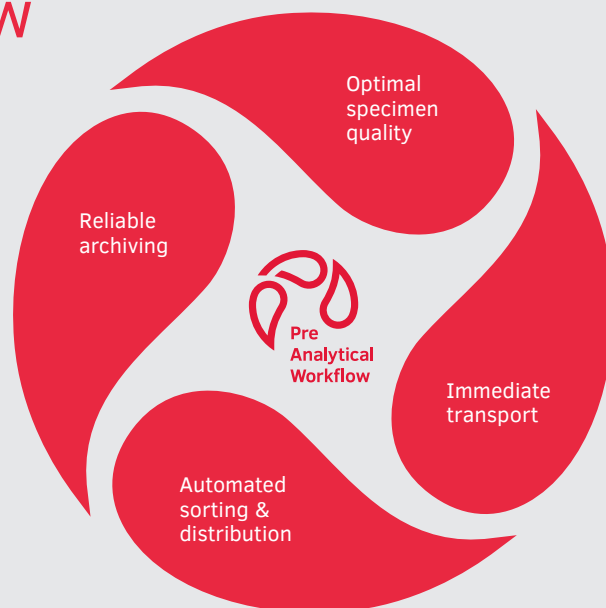
- > The system is fairly intuitive – users need very little training and maintenance is minimal
- > Colin West, Head of Diagnostics

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