A Leap into 21st Century Diagnostics

With the National PET Center for medical diagnostics, which was supplied in turnkey condition by Siemens, the Clinical Center of Serbia has made a giant step forward in raising the country's standards of diagnosis and treatment control to those of Western European levels. Vladimir Obradovic, Director of the Institute of Nuclear Medicine, explains the importance of this project against the backdrop of healthcare reform in Serbia.

By Andreas Ernst

The Clinical Center of Serbia, located in Belgrade and completed in the mid-1980s, is one of the world's largest hospitals, with 3,500 beds, a staff of 7,500, and 1,200 physicians. The facility has been marked not only by the proud history of the Yugoslavian healthcare system, which led the region in the 1970s, but also by the effects of the Balkan War in the 1990s. Things began to improve again ten years ago when the Serbian healthcare system first started to look like a bustling construction site. Across the board, from financing to training to infrastructure, reform is still in progress, with the aim of helping the Serbian healthcare system catch up to Western European standards. And nowhere more so than in the basement of the Clinical Center, which has been home to the National PET (positron emission tomography) Center since the fall of 2009. When Professor Vladimir Obradovic opens the door to the PET Center for us, he tells us with a smile, "Now we've arrived in the 21st century!" The contrast to the dark corridors in the Clinical Center above us is impressive: The walls of the department, which occupies 700 square meters of space, gleam in a soft pink tone. Behind thick greenish steel-reinforced safety glass is the center's heart – and its pride and joy: a Siemens Biograph™ 64 TruePoint™ PET·CT unit. To help ensure that this system is put to optimum use, Siemens worked together with clinic management and local service providers to develop a comprehensive solution covering everything from the center's integration into the clinic in terms of business administration to construction planning and even the efficient organization of workflows. As a result, employees are offered the best possible working conditions, while the clinic's diagnostic capacity is greatly increased.

Professor Obradovic, what does the new PET Center mean for healthcare in Serbia?

OBRADOVIC: The new PET Center puts us where we want to be: at the forefront of modern diagnostic technology. PET, as a diagnostic method in nuclear medicine, represents a quantum leap in the quality of our healthcare system.

What is your role in this project?

OBRADOVIC: The Ministry of Health appointed me to serve as the president of a project group made up of radiologists, oncologists, and neurologists, in 2005. The group was commissioned with making preparations for the introduction

Biography

Professor Vladimir Obradovic, MD, PhD, is one of the leading nuclear medicine specialists in Serbia. Since 1995, he has been the Director of the Institute of Nuclear Medicine at the Clinical Center of Serbia in Belgrade. After completing his studies of medicine in Belgrade, he earned a second doctorate in natural sciences. He went on to further study in Paris, France, and in Tübingen, Germany, before taking the helm at the Institute of Nuclear Medicine. Since 1996, he has taught at the medical school at the University of Belgrade as a full professor. Obradovic is married to Zorica Petrasinovic, who also works at the Clinical Center of Serbia as an internist and cardiologist.

Siemens in Serbia

Siemens has been active in Serbia since 1887. The company was responsible for building the country's first power plants and for installing the first public lighting systems in the city of Belgrade in 1887. The Yugoslavian division of Siemens AG, based in Zagreb, was founded in what was then the "Kingdom of Serbs, Croats, and Slovenes." The office in Belgrade was responsible for supplying power cars for the streetcar lines in the capital city. A department focusing on medical technology was also founded there in 1929. The Serbian company Siemens Elektrizitäts AG (Electricity Corp.) was founded during the German occupation in 1941. In communist Yugoslavia as well, Siemens remained an important supplier for the state railway and telephone services. Today, the company is responsible for serving Serbia and Montenegro. After the country embraced democracy in 2000, Siemens was involved in rebuilding the country as a leading provider of infrastructure and technology.

of this technology. The focus was not only on the National PET Center, which is ready here, but also on introducing PET throughout the country. Our center is the basis for satellite centers, smaller units located throughout the country that are supposed to provide full-coverage care. The national center has a clinical mandate, but at the same time, it serves to train specialists and is used for research purposes in the area of diagnostics.

What is special about planning and equipment at the National PET Center?

OBRADOVIC: The project has two phases. The first was the construction of a turnkey PET Center by Siemens, which came into operation in the fall of 2009. The center has a hybrid PET/CT unit, which will soon be joined by a second unit. For the next step, we are planning to install a cyclotron so that we can produce the radiolabeled tracers for PET/CT scanning ourselves. Because some of these radionuclides have short half-lives, it is important for us to produce them in close proximity to where they will be used. At the site, we will operate a small factory for radiopharmaceuticals to supply not only our center, but also the satellites throughout the country.

Will your in-house production of radionuclides also yield economic benefits for you?

OBRADOVIC: Yes, it will help us cut costs. Today, the costs of an exam run at about 1,000 euros. If we produce the radionuclides ourselves, we can reduce that figure by about 60 percent. We will be the first center in the region to produce radionuclides. It is a definite possibility that we could produce radionuclides for PET centers in neighboring countries, such as Croatia, Macedonia, or Romania.

Why did you choose Siemens for the implementation of the PET center?

OBRADOVIC: We ran a request for proposals, and Siemens came out with the best results. That was primarily due to the value for the money; the technology offered by the various providers is very similar, but Siemens was also willing to take special technical requests into consideration. In fact, we want to use the systems not only to perform routine examinations, but also to implement research projects. We were also quickly able to reach an agreement regarding how to finance the training of specialists. And finally, there is the fact that Siemens has a very good, longstanding basis in our region. That is advantageous when it comes to service.

How many PET centers does Serbia need?

OBRADOVIC: Each PET unit serves the needs of about a million people. That means that to cover Serbia's population of nearly seven million, we need seven systems. That's the medical side of the equation – whether it can be put into practice, of course, depends on the country's ability to finance it.

What will change for patients thanks to the new center?

OBRADOVIC: We will be able to diagnose common diseases, such as cancers, neurological disorders, and cardiac diseases more quickly and with greater precision. Following a primary diagnosis, which serves as an indication for diagnosis with PET, the process of establishing overall findings will be fast. That helps improve our patients' chances of recovery. The incidence of malignant tumors is on the rise in this country, a fact that is prob-

Turnkey Solution: The National PET Center in Serbia

Siemens doesn't just supply equipment, it offers holistic solutions. "The Clinical Center provided us with 800 square meters in the basement of the facility, and just told us, 'okay, get to work'," explains Ratko Krakovic of Siemens Healthcare. The project management activities included the full planning for the unit in cooperation with architects and engineers. In addition, the company had to coordinate the work performed by nine supplier companies, which had been called in to provide a range of services from radiation protection to computer equipment and furnishings. One extremely important factor was the close cooperation between Siemens and Neimar, a leading construction company in Serbia. Siemens was even able to obtain a building permit – no easy task in Belgrade's bureaucratic jungle – within a very short period. In total, 19 sub-projects were implemented, some of them in parallel, until finally, after just one-and-a-half years, the government-run Institute of Nuclear Sciences for Radiation Protection in the town of Vinca granted its approval for the facility to start work.

ably connected to the many aspects of physical and mental strain that affect us in our postwar society. At present, we examine ten patients per day. Later, when we are producing radiopharmaceuticals ourselves, thanks to the cyclotron and the radiochemical lab, the number will be at least 30 each day.

Serbia's healthcare system was isolated for a long time. What kind of international networks are in place today?
OBRADOVIC: In our field, there is intensive international cooperation with bodies such as the International Atomic Energy Agency, which finances research projects at our institute. We also regularly send specialists abroad for continuing education and training, and experts from elsewhere in Europe, the United States, and Asia visit us as well. These contacts show that Serbia is being integrated more and more into the international research landscape. But Serbia also has its own 50-year tradition of nuclear medicine: The Central Laboratory for Nuclear Medicine was founded in Belgrade in 1958.

What will be the greatest challenges facing the Serbian healthcare sector over the next few years?
OBRADOVIC: A technological shift in diagnostics, such as the one represented by the introduction of the PET method, is critically important. A lot has been done with regard to the infrastructure of our hospitals and institutes – but there is still a long way to go. The pace of reform, of course, depends on the general economic development in the country. Luckily, we still have most of our specialists – at least in my specialty. I hardly know anyone who left during these difficult years. All of us have stayed here, and we are all working enthusiastically on further developing nuclear medicine. Thanks to the cutting-edge technology we have here, and in light of our intensive cooperation with colleagues from all over the world, there's no reason to go anywhere else!

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Further Information

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Summary

Challenge:
- Improve diagnosis of oncological, neurological, and cardiological diseases
- Shorten waiting times for patients
- Regionalize high-tech diagnostics

Solution:
- Integral planning and development of a turnkey PET/CT center in cooperation with the clinical facility and suppliers
- Siemens Biograph 64 TruePoint PET·CT for diagnosis, treatment control, and research work
- Independent production of radiopharmaceuticals to reduce costs and for distribution to PET centers in the surrounding area
- Development of satellite units at regional hospitals

Result:
- Faster diagnoses
- Infrastructure not only for clinical application, but also for research and education
- Long-term partnership with Siemens for countrywide development of the diagnostic infrastructure