

# Compact Gamma Camera Fits German Clinic's Plans to Modernize

A compact design, augmented by high performance and patient-friendly features, led administrators at radprax MVZ to choose Siemens' Symbia Evo™ Excel\*. Its easy installation at the German clinic and efficient operation began paying dividends within days of its delivery.

By Greg Freiherr



At radprax MVZ in Wuppertal, Germany, Symbia Evo Excel fits into a pre-existing room with little to no modification. The scanner was up and running within one week.

Designed to squeeze into rooms almost a third smaller than those housing other general purpose SPECT systems, Symbia Evo Excel installed easily at radprax MVZ in Wuppertal. The clinic, one of 30 such centers in the German medical practice, specializes in radiology, nuclear medicine, radiation therapy and cardiology. The space set aside at the Wuppertal center for Symbia Evo Excel was previously occupied by a similarly compact gamma camera, Siemens' BodyScan.

Eliminating the need to expand the room saved money immediately, just as the design of the system promised to reduce the cost of total ownership

through efficient operation and minimal maintenance. Its installation at radprax clinic was among the world's first.

Symbia Evo Excel was commercially released in 2014 after debuting at the 27th Congress of the European Association of Nuclear Medicine (EANM). The Wuppertal clinic took delivery of a prototype in August 2014. Advantages in system design began paying early dividends in its setup, as the SPECT system began scanning patients soon after its delivery.

"After removing the previous gamma camera and updating the camera room, Symbia Evo Excel was fit

for service within one week," recalled Marcus Middendorp, MD, a Nuclear Medicine Specialist at radprax MVZ. "The easy installation allowed us to return quickly to our normal workflow."

#### Small Size, Big Performance

Symbia Evo Excel can fit in a room as small as 3.60 m (11 ft 10 in) by 4.57 m (15 ft), while allowing space for the technologist to work with the patient. For this reason, the new, compact SPECT system was at the top of a short list of candidates considered by the Wuppertal clinic.

"Due to the restricted size of our camera room, not all gamma cameras offered



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**Marcus Middendorp, MD**

Nuclear Medicine Specialist, radprax MVZ, Wuppertal, Germany

## Bone imaging

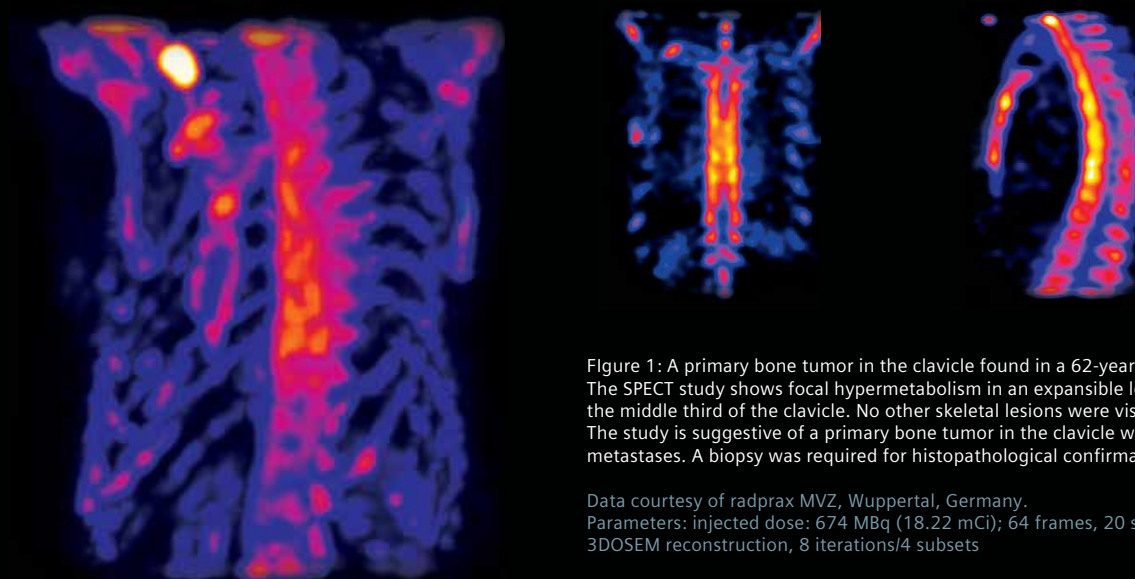


Figure 1: A primary bone tumor in the clavicle found in a 62-year-old woman. The SPECT study shows focal hypermetabolism in an expansible lesion involving the middle third of the clavicle. No other skeletal lesions were visualized. The study is suggestive of a primary bone tumor in the clavicle without metastases. A biopsy was required for histopathological confirmation.

Data courtesy of radprax MVZ, Wuppertal, Germany.  
Parameters: injected dose: 674 MBq (18.22 mCi); 64 frames, 20 sec/frame;  
3DOSEM reconstruction, 8 iterations/4 subsets

on the market would be able to fit," said Middendorp, who joined the radprax staff in 2011. But it was the advanced operation of the SPECT system that clinched the deal, he said: "We compared the properties of gamma cameras that might work from different manufacturers and Symbia Evo Excel was the best."

Middendorp cited the small footprint of the system, leading detector technology, an "appealing camera design" and the high-capacity patient bed (up to 227 kg or 500 pounds) as the system's most attractive properties. Its flat panel efficiently displays structured menu items, he said, while its whole-body SPECT software "allows the simple assembly of two SPECT acquisitions."

Symbia Evo Excel's fast patient set-up and advanced detector has cut the time for bone scans at the Wuppertal clinic to 35 minutes from the 45 to 60 minutes required by its predecessor. The new SPECT system handles between 15 and 20 patients per day, many of them presenting challenges that other scanners would be hard pressed to meet.

Despite its compact design, the dual-head SPECT offers a 30 percent\*\* larger

bore than the e.cam, which the Wuppertal clinic continues to operate as its second on-site gamma camera. Symbia Evo Excel's wide, thin bore is just 44 cm (17 in) deep with an opening that measures 101.2 cm by 78.3 cm (39.8 in by 30.8 in). The bed capacity combined with a scan range of up to 200 cm (79 in), the radprax nuclear medicine department in Wuppertal can use the new system to examine tall and heavy patients.

"We see very large and obese patients, and this has certainly been an important aspect in handling them," Middendorp said.

Fast, open scans make patients more comfortable, Middendorp said. This leads to greater overall efficiency not only by reducing the time to conduct individual exams but by allowing the Wuppertal clinic to handle patients who are uncomfortable in tight spaces.

"Only a very small proportion of patients cannot be investigated due to claustrophobia," Middendorp said.

Symbia Evo Excel's detector heads can be configured to suit a wide variety of

SPECT studies from general purpose to oncology, neurology and cardiology. The dual-head detectors can be positioned at 180, 90 or 76 degrees and tilted forward or back to optimize sensitivity and throughput. Scan set-up is accelerated by an efficient menu structure featuring icons that indicate the detector orientation for different kinds of exams.

Further streamlining the exam process is a reduction in the steps needed to reconstruct the raw data, according to radiographer Gabriele Gottschall. "This means quicker access to images for doctors and shorter wait times for patients to receive their results," Gottschall said.

### Wide Ranging Success

Since Symbia Evo Excel was installed, Middendorp and colleagues have used their new scanner to perform a wide range of applications: evaluating kidney function; assessing thyroid nodules; performing lung ventilation and perfusion studies on patients suspected of pulmonary embolism; even using an octreotide conjugate to examine somatostatin receptors for evidence of neuroendocrine tumors, which are notoriously difficult to identify.

## Brain SPECT imaging of striatal metabolism

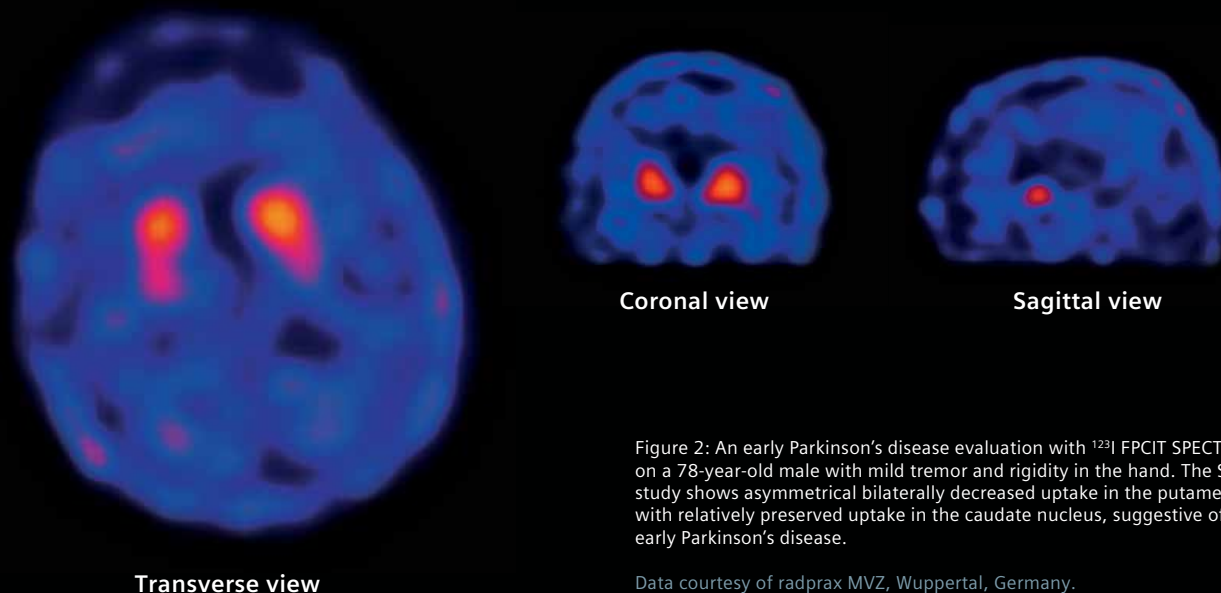


Figure 2: An early Parkinson's disease evaluation with  $^{123}\text{I}$  FPCIT SPECT on a 78-year-old male with mild tremor and rigidity in the hand. The SPECT study shows asymmetrical bilaterally decreased uptake in the putamen with relatively preserved uptake in the caudate nucleus, suggestive of early Parkinson's disease.

Data courtesy of radprax MVZ, Wuppertal, Germany.  
Parameters: injected dose: 196 MBq (5.3 mCi)  $^{123}\text{I}$  FPCIT (DATscan);  
120 frames, 25 sec/frame; 3DOSEM reconstruction, 8 iterations/16 subsets



Symbia Evo Excel supports gurney and hospital bed imaging, helping physicians at radprax MVZ scan a wider range of populations more easily.

One of the most frequent examinations done at the Wuppertal clinic on Symbia Evo Excel is bone imaging. One study, performed on a 62-year-old woman, showed focal hypermetabolism in the middle third of the clavicle, suggesting a primary bone tumor in the clavicle without metastasis, a diagnosis later confirmed with biopsy (*Figure 1*).

Another major area of application, cardiology, benefits from the simplified workflow possible on Symbia Evo Excel, which speeds patient handling, without compromising the quality of the study. A tool, called Corridor 4DM, streamlines the reporting process for myocardial perfusion scintigraphy, for example, arranging and presenting data in concentrated form.

Results can directly impact the management of the patient, as in a gated stress-rest study of a 46-year-old man at radprax MVZ. Radiotracer uptake was normal during rest, but decreased throughout the left ventricle at peak stress. Having demonstrated this reversibility, data from the high-resolution study led Middendorp and colleagues to recommend revascularization.

Symbia Evo Excel also proved effective in an early Parkinson's disease evaluation with  $^{123}\text{I}$  FPCIT SPECT on a 78-year-old man who demonstrated mild tremor and rigidity in the hand. The SPECT study showed asymmetrical

bilaterally decreased uptake in the putamen with relatively preserved uptake in the caudate nucleus, which suggested Parkinson's disease (*Figure 2*).

The low position of the bed—just 53 cm (21 in) from the floor—provides easy access for the patient being examined on the Symbia Evo Excel. The table also can slide out of the way, so critically ill or immobile patients can be examined on a gurney. Such a study was performed at radprax MVZ on a 34-year-old obese man with limited mobility. Dynamic images, followed by a static image taken one hour after ingestion of a radiolabeled meal, showed normal gastric emptying with negligible gastric stasis.

#### Engineered for Ease

Just as its detector versatility supports the wide range of patients sent to the Wuppertal clinic, Symbia Evo Excel is engineered to support high throughput. Intuitive controls, accessible on the outside of the tunnel, an articulated patient positioning monitor and moveable table top allow efficient patient set-up. SPECT acquisitions are assembled and presented to accelerate interpretation using a tool called Body SPECT, which optimizes the presentation and number of images.

High-definition, energy-independent detector technology and low pallet attenuation support high sensitivity and resolution. Image quality is further bol-

stered by an infrared body-contouring system that minimizes the distance between patient and detector; collimators that optimize sensitivity, delivering 26 percent\*\*\* more counts for increased sensitivity compared to other general purpose scanners; and iterative reconstruction algorithms that reduce noise. Together these technologies deliver up to 24 percent\*\*\* higher resolution than comparable systems, based on NEMA standardized tests.

The modernization, achieved through Symbia Evo Excel, has brought nuclear medicine in Wuppertal in line with other offerings, Middendorp said.

"We have very modern CT and MRI equipment," Middendorp said. "Having a modern SPECT system means a lot." ■

\* Symbia Evo Excel is not commercially available in all countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens organization for further details.

\*\* Compared to previous systems.

\*\*\*Based on competitive literature available at time of publication. Data on file.

The statements by Siemens customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.