

# Symbia Intevo Transforms Dutch Hospital with State-of-the-art SPECT/CT

When Slingeland Hospital decided to update its nuclear medicine department, it acquired Siemens' next-generation SPECT/CT, Symbia Intevo™\*. Six months later, the Dutch hospital was expanding its referral base in orthopedics and increasing its overall productivity.

By Greg Freiherr



Symbia Intevo's patient-friendly 70 cm (27.5 in) open gantry design.

For more than 20 years, the 348-bed Slingeland Hospital in Doetinchem, The Netherlands, relied on a single-detector gamma camera installed in 1993 for the majority of its nuclear medicine exams. While this aging workhorse continued to perform, the team recognized that over the years SPECT/CT had emerged as the benchmark of clinical excellence and felt the need for change.

"We saw an increasing demand for SPECT/CT and with it the emergence of many specialty indications," said Wouter van der Bruggen, MD, Slingeland Hospital's Nuclear Medicine Physician and a member of the Bone and Joint Committee of the European Association of Nuclear Medicine (EANM). "So we definitely recognized the importance in offering SPECT/CT."

In August 2014, the Dutch hospital replaced its Siemens single-head Diacam with Siemens latest-generation SPECT/CT system—Symbia Intevo. With its unique integration of modalities, Symbia Intevo leverages CT's anatomical resolution to boost the clarity of SPECT images of bone and surrounding tissue.

Since then, van der Bruggen and his staff at Slingeland Hospital have been using their state-of-the-art technology to distinguish their services from those of surrounding hospitals—Streekziekenhuis Koningin Beatrix (Hospital Queen Beatrix), a 214-bed general hospital in Winterswijk (20 kilometers from Slingeland Hospital); and Rijnstate Hospital (about 40 kilometers away), a 700-bed facility in Arnhem.

"Even in 2014, the technicians were sad to see the Diacam camera go," van der Bruggen said. "It had always served them well. That said, I think we now have a tool that is hard to beat by our neighboring hospitals," van der Bruggen added. "With this machine, we can do the best imaging; we definitely have a strong case for orthopedic patients."

Although still relatively new, Slingeland Hospital has been making that case effectively by increasing the number and type of orthopedic referrals it receives. It has expanded into foot and ankle examinations and plans to increase its number of hip and knee prostheses cases.

"This is one area I would like to get a more regional appropriation of patients," said van der Bruggen who, since joining Slingeland Hospital in January 2010, has exercised a penchant for orthopedic scanning.

#### Surging Interest in Bone

van der Bruggen generally credits the availability of Symbia Intevo's high-performance hybrid imaging for the surge of interest in orthopedic scanning at Slingeland Hospital. But he notes that the unique bone imaging technology called xSPECT Bone\*, offered with Symbia Intevo, has contributed, as well.

"It is mainly the step from planar to SPECT/CT, but the enthusiasm of orthopedists to ask for these scans is partly because of xSPECT Bone technology," he said.



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Slingeland Hospital, Doetinchem, The Netherlands

In conventional SPECT/CT, image quality suffers because the algorithms that reconstruct the SPECT datasets reduce the CT resolution to that of SPECT, the lowest common denominator of the data. This produces images of tissues and structures that appear fuzzy and indistinct.

Symbia Intevo takes a different approach. When generating images, the system's unique xSPECT\* technology uses the high-resolution CT data as reference points, fitting SPECT data within tissue classes or "zones" that clearly delineate different types of tissue. These zones correspond to lung, adipose, soft tissue, soft bone and cortical bone.

This new integrated approach provides an advantage, according to van der Bruggen. In comparison to SPECT/CT bone images obtained using other hybrid scanners, xSPECT Bone images help to increase diagnostic confidence. "It is a very clear image," he said. "I have examples that allow me to more precisely show on scintigraphy where the lesion started and ended—where it was localized—with less scatter and less blurring," he said. "The lesions are more precisely placed right on the CT findings, so that is very helpful."

While bone imaging currently accounts for about 30 percent of the patients scanned in the nuclear medicine department at Slingeland Hospital, the team at Slingeland foresees continued growth in their procedure volume.

#### A Boost in Productivity

Today, the biggest demand for nuclear medicine at Slingeland Hospital is cardiac imaging. About 35 percent of all the hospital's nuclear medicine exams involve myocardial perfusion imaging (MPI), for which they use IQ•SPECT technology, an optional feature on their Symbia Intevo.

Unique to Siemens scanners, IQ•SPECT allows the nuclear medicine team to perform MPI studies faster or with lower injected dose than other scanners using conventional parallel-hole collimators\*\*. The key to this capability is a multifocal collimator. This collimator rotates around the patient in a cardio-centric orbit, keeping the heart in the center of the detector rotation so as to gather the maximum number of counts from the heart while avoiding truncating the rest of the body.

Although xSPECT and IQ•SPECT stand out, a productivity package installed on

the Symbia Intevo at Slingeland Hospital is also notable, according to van der Bruggen. Automated Quality Control (AQC) automatically completes and reports quality control tasks before the arrival of patients, thereby streamlining workflow. Adding to the efficient operation of the department is Symbia Intevo's Automated Collimator Changer (ACC), which motorizes the exchange of collimators.

Slingeland Hospital is also still making the most of its Siemens dual-detector e.cam, which was installed about 10 years ago. While bone disorders, particularly those with suspected fractures and symptoms of lower back pain, are typically sent to Symbia Intevo, because of its added value, some cancer patients are initially examined on the e.cam system. If the scan is indeterminate or a "spot view" is deemed necessary, the patient may be sent for a second study on the Symbia Intevo scanner.

#### Delivering Information Better

Symbia Intevo provides just the right amount of information, according to van der Bruggen. He explained that xSPECT Bone generates sharp images of structures "but doesn't present so much structure that it distracts you from the physiological information."



When viewing an xSPECT Bone image of the spine, for example, “I see the information from the spine and the ribs, but no extra information from the abdomen,” van der Bruggen said. “That is very good; with xSPECT Bone, structural information is selective,” he said.

Integrated SPECT/CT exams, performed on Symbia Intevo, have helped substantially in diagnosing and managing patients at Slingeland Hospital. Its images are particularly useful when communicating results to referring physicians, according to van der Bruggen. “They definitely add confidence and ease in showing the clinician what I have reported,” he said.

“In my personal experience, the fused SPECT/CT images are, in the end, what really helps confirm the physician diagnosis,” he said.

Symbia Intevo distinguished itself early at Slingeland Hospital with the quality of its images, attracting European specialists in nuclear medicine who were curious to see what the new SPECT/CT could do. Cases van der Bruggen has shown guests include cancer in the pelvis and spine, as well as bone disease in the foot and ankle.

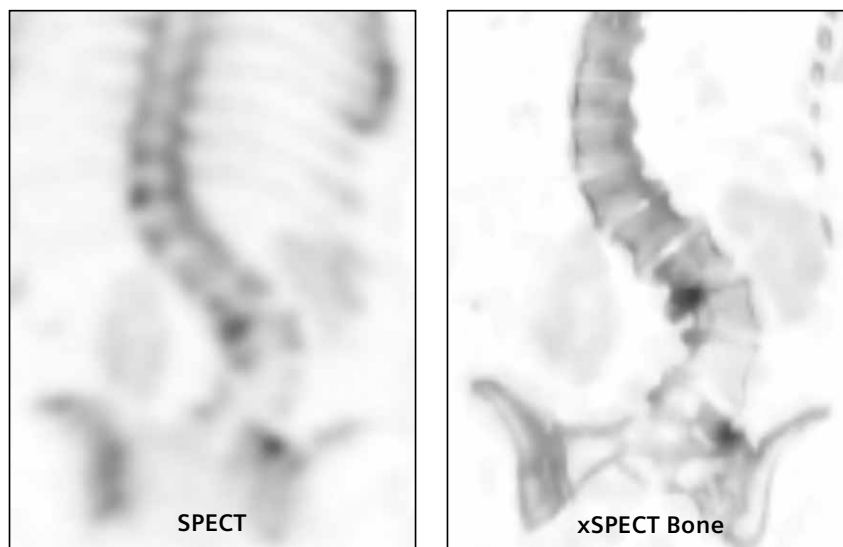


Figure 1: Normal SPECT image (left) compared to xSPECT Bone image (right) of a patient with known breast cancer showing scoliosis and spondylosis and excluding osseous metastases.

In late March 2015, the hospital began using another new feature offered on its Symbia Intevo, xSPECT Quant\* quantitative technology, which calculates absolute tracer uptake from the imaging data. van der Bruggen plans to use quantitation to assess patient response to cancer therapy. When in routine

operation, xSPECT Quant will provide a numerical indicator of response, just as xSPECT Bone now helps identify metastasis.

“I have high expectations for xSPECT Quant, as we plan to use this new technology to assess and follow patient disease,” he said. ■



The Symbia Intevo scanner with xSPECT Bone technology at Slingeland Hospital (left). Outside view of Slingeland Hospital in Doetinchem, The Netherlands, a 348-bed facility (right).

- \* Symbia Intevo, xSPECT, xSPECT Bone and xSPECT Quant are not commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens organization for further details.
- \*\* 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.