

Image Quality Supports Higher Standards of Care for All Patients: FlowMotion

Continuous-bed-motion (CBM) scanning with Biograph mCT Flow™* translates into image quality and efficiency, shared two users, one in Lomme, France, the other in Chattanooga, Tennessee, USA. But there's a lot more to this PET/CT scanner. And it relates to the bigger picture of quality of care.

By Greg Freiherr

Alban Bailliez, MD, and colleagues in the Nuclear Medicine Department of Saint Philibert Hospital, Lomme, France, are scanning patients faster and generating images with higher resolution than was possible before they began operating Biograph mCT Flow. "We do the exams in less time and at higher quality," Bailliez said.

At a multi-hospital system with five campuses in Chattanooga, Tennessee, USA, Saima Muzahir, MD, leverages Biograph mCT Flow to provide patient-centric care by deliv-

ering exceptional data quality. "With respiratory gating, we don't have motion artifacts, which means excellent imaging and quantitation makes a difference," Muzahir said. "With the help of respiratory gating, I have improved my sensitivity and specificity in very small nodules."

The improved quality of care that results is rooted in the ability of Biograph mCT Flow to perform a deceptively simple, yet critical task—to move the patient continuously through its gantry at programmable and variable speeds.

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Saima Muzahir, MD
Nuclear Medicine Physician
Chattanooga, TN, USA



Standardized Protocols:

The Game Changer in Patient Care

Working with medical staff in Lomme, France, and Chattanooga, Tennessee, Siemens clinical specialists helped to initially set up protocols with table speeds relevant to the pathologies these sites routinely encounter. In each protocol, the table slows to allow more counts from body areas of greater interest and speeds up when covering those of lesser interest.

Both sites routinely leverage CBM, made possible through Siemens’ FlowMotion™ technology, to assess patients with head and neck cancers. In these, the head and neck are scanned slowly to maximize the number of counts. Data are reconstructed into a high-resolution, 400x400 pixel

matrix. Similarly scanned and reconstructed is the liver, where metastases often hide. Other body areas are scanned faster and reconstructed at lower resolution.

This approach delivers high-resolution images of the areas of greatest clinical interest, yet imposes no time penalty. The Biograph mCT Flow at Saint Philibert Hospital nets a savings of about five minutes per exam, compared to their previous PET/CT scanner.

“We now average between 15 and 20 minutes per patient,” Bailliez said, “compared to between 20 and 25 minutes (with conventional PET/CT).”

Reduced complexity and greater efficiency has added capacity that can be

used to serve a growing patient population. “We could explore doing up to 30 patients per day without problem,” he said, noting that the current daily average is about 20.

At the Chattanooga, TN, facility, Muzahir is enthused about the respiratory gating that FlowMotion makes routinely possible for her lung cancer patients. Gating is now integrated into the base protocol, which is positively impacting the standard of care for every patient.

Its effect on standard uptake value (SUV) quantitation, Muzahir said, is remarkable. Muzahir and her colleagues recorded and then compared SUV_{max} in several patients with and without respiratory gating. “We found

a more than 50 percent difference in the values,” Muzahir said. “That is a significant difference when you are trying to call something malignant versus non-malignant.”

Confidence Through Consistency

Muzahir credits the acquisition approach of Biograph mCT Flow for improving data quality when assessing lung cancer, as well as the many other types of cancers seen at the Chattanooga facility, including lymphomas, melanoma and cancers of the prostate and breast. Continuous bed motion diminishes the chance of artifacts that can occur during stop-and-go scans due to overlaps between bed positions.

“Eliminating the overlapping bed acquisitions and maintaining the uniform axial noise sensitivity across the entire scan decreases the actual noise variance,” she said. “This helps you bet-

ter quantify the lesions based on SUV_{max} . And the reproducibility is maintained because of that.”

Bailliez noted the importance of reproducibility when using Biograph mCT Flow at Saint Philibert Hospital. In conventional stop-and go scanning, he noted, data may be sampled anywhere in the field of view (FoV). If the sampling points are not the same before therapy as during or after, values may sometimes vary. Because FlowMotion protocols are built around organs rather than bed positions, the values are consistently acquired from the same locations regardless of when the exams are performed. This results in highly reproducible images and SUVs.

“We observe in our patients the same quality on the exams at different times,” Bailliez said. “Because we see the same quantification values in the normal organs at those times, we are

very confident that we can compare the two exams—and that we can depend on the differences we see in the SUVs.”

Excellent Image Quality Without Compromise

Simplicity and dependability are key to the success of FlowMotion. Each protocol used by the French and American staff is triggered with a single click. So evident in the operation of Biograph mCT Flow, this simplicity is reflected also in the speed and ease with which staff are trained.

Other advantages accruing from FlowMotion address patient comfort and safety. One relates to what patients feel as they move through the PET/CT gantry.

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Alban Bailliez, MD
Nuclear Medicine Physician
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through the exam," Bailliez said. "They do not wake up, because the bed doesn't stop and start from one bed position to the next, as happens in conventional scanning." The sudden movements from the previous PET/CT scanner not only kept patients awake, they sometimes startled them, he mentioned, causing motion artifacts.

Muzahir notes that the fast scans possible using Biograph mCT Flow further reduces the chance of patient motion. This improves image quality, she said, and contributes to a positive patient experience.

Another advantage obtained through FlowMotion is the reduction in CT radiation dose. Because FlowMotion protocols focus on specific organs and body areas, radiation exposure is restricted to just the parts of the body being examined. In conventional scans, the CT covers the entire bed position,

regardless of whether data on the whole bed is needed. The clinic staff also routinely use Siemens CARE Dose4D™, which further minimizes CT exposure.

"We systematically apply the lowest CT dose possible," Bailliez said. "We think that FlowMotion leads to optimal radiation exposure for the patient."

"We have been able to use about 15 percent lower dose," Muzahir said. "It is very important to minimize the radiation dose when you are imaging a ten-year-old who has another 50 or 60 years ahead."

Those kinds of concerns go to the root of imaging, Muzahir said.

"The idea is to deliver patient-centric care," Muzahir said. "That is our main focus." ■

* Biograph mCT Flow 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.

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.