

Swiss Paraplegic Center: In Search of the Malleable Machine

Robotics and auto-stitching software enable the Swiss Paraplegic Center in Nottwil to effectively serve a difficult patient population with digital radiography.

By Judith Gunn Bronson, MS

The Swiss Paraplegic Center in Nottwil, which opened in October 1990, is a National Center of Competence that provides comprehensive care to paraplegic and quadriplegic patients who come not only from Switzerland, but from all

over Europe (and, indeed, the world). The more than 1,000 center employees use the latest in medicine, social services, vocational training, education, and technology to restore patients to the highest possible level of independent function and participation. Patients can be managed from the time of onset of spinal damage through vocational training and finding a new place to live or a new job. In 2005, almost 300 patients began their treatment with a stay in the intensive care unit that averaged 7.4 days and more than 15,000 days of artificial ventilation were delivered.

An institute within the center is devoted to research aimed at making care even better in the future. In contrast to years past, when accidents were the principal cause of spinal-cord injury, almost half of today's patients at the center have an illness such as vascular disease or cancer as the cause of their impairment. As a result, the patients tend to be older (and thus to have more comorbidities) than patients seen in earlier years.

On average, almost 800 patients are receiving some type of treatment at the center on any given day. Much of this treatment is in the form of care for the decubitus ulcers, genitourinary infections and incontinence, respiratory complications, and neuropath-



Paraplegic and quadriplegic patients come from all over Europe for care at The Swiss Paraplegic Center, Nottwil.

ic pain that are so prevalent after spinal-cord injuries. Patients, however, also can practice in on-site homelike environments to maximize their ability to cope when they leave the facility. Some learn to walk on up-to-date training equipment such as the

Lokomat or participate in equine therapy, sports activities, or psychotherapy to help them adjust to their new circumstances. The individuals who will care for the patients once they leave the center also receive training.



The Swissray ddRCombi Trauma system has enabled the center to reduce room time.

Not all education at the center is for patients and their families. A program has been established to prepare new prostheticists to serve patients with spinal-cord injuries. Employees can also attend foreign-language classes, and health care professionals from all over the world attend conferences and seminars. Help is provided to patients in finding the necessary financial aid for their specialized care.

The condition of the patients and the support equipment they so often require create unique challenges for the radiology department, even with its technologically sophisticated equipment. Well over 5,000 MRI examinations are performed annually, and the center has the first Siemens Sensation 40 multidetector-array CT scanner to be installed in Europe. A new acquisition is the Swissray ddRCombi Trauma system, which the center helped the company develop. It replaced a computed radiography (CR) system and is used mostly for inpatients, although some outpatients and referrals also are imaged.

According to Markus F. Berger, MD, senior consultant in radiology, the complexity of the center's cases means that 15 to 20 patients are examined per day. This is not as many as would be seen in a typical radiography practice, so the features of the ddRCombi Trauma system are especially helpful. Most of the time required for a study is consumed by the difficulties of moving the

paraplegic or quadriplegic patient from the wheelchair or bed to the table. Nevertheless, "The room time has decreased," Berger reports. "Once the procedure begins, we can have an image on the screen in 5 seconds."

The center has found the image quality to be better with the new system than with the CR system it replaced. "We confirmed the higher resolution with line-pair trials; the resolution can be as high as 3.5 line pairs per mm. Also, with windowing, leveling, zoom, and such, even bad images can often be fixed, which is helpful for these difficult patients and reduces our retake rate," Berger says.

Some other features of the ddRCombi Trauma system proved helpful. "With film-screen radiography, it was difficult to get the exposures of whole-spine images to match because of the differences in the tissues in the different areas, such as the pelvis and the thorax," Berger notes. "The AutoStitching function makes superb whole-spine images easy to obtain. We also measured the radiation dose, which is a serious concern in this population because they require so many imaging studies, and we found it was half that of our previous CR system."

The center converted to an all-electronic information-management environment eight years ago, and Berger described the integration

of the ddRCombi Trauma into the network as exceptionally smooth. The center also has found the system to be highly robust. Its Panel Protection program, combining the ability to halt system movement if an obstacle is detected with shock-absorbing features, helps protect it from damage during these difficult cases. Swissray guarantees 99% uptime.

"In the last few years, our system was upgraded regularly," Berger says. "We now have equipment that is extraordinarily robust, almost never fails, and delivers image quality second to none. Anyone in the market for direct digital radiography should have Swissray on their short list of possible vendors." ■

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Markus F. Berger, MD