Clinical Efficiency and Confidence with IDENTIFY SGRS System v3.0

Overview

The MVZ RON Baden-Baden Strahlentherapie clinic is located in Horb am Neckar, Germany, with a team of two physicists and four radiotherapists. It treats about 900 radiotherapy patients annually using equipment that includes one Varian TrueBeam version (v) 2.7 with a 4 degrees-of-freedom couch, IDENTIFY v3.0, Eclipse/ARIA v15.6, Varian Afterloader GammaMed iX, and a Siemens SOMATOM Confidence RT Pro CT scanner.

Goals

As part of implementing a brand-new cancer care facility, the Radio Onkologie Netzwerk organization decided to implement Varian IDENTIFY to help with its clinical goals of improving accuracy, patient safety, and efficiency. This includes eliminating markers and tattoos for patients, streamlining workflows, and decreasing treatment times.

Benefits

As a result of implementing IDENTIFY, the clinic has eliminated the need for tattoos and markers and reduced median set up times by 59% (from 80 seconds (s) to 33s) using IDENTIFY compared to tattoo setups (see table 3). Positioning accuracy is at least as good as positioning accuracy with tattoos, with slightly reduced magnitude of couch shifts based on image guidance for both breast and prostate patients studied (see tables 4 and 5).

Implementing IDENTIFY: From pilot to network expansion

The MVZ RON Baden-Baden Strahlentherapie clinic in Horb am Neckar covers radiotherapy needs for patients across a broad rural area near the Black Forest in the south of Germany. It currently treats between 50 to 60 patients a day on their TrueBeam, and is part of the Radio Onkologie Netzwerk, a wider organization of 30 radiotherapy clinics throughout Germany.

The clinic in Horb am Neckar opened in June 2020 with the commissioning of a Varian TrueBeam. Initially, radiotherapists positioned patients for treatment manually, using imaging with markers and tattoos. Having seen IDENTIFY at a conference, head physicist Julian Stange agreed to pilot the patient positioning system across the network of clinics and became one of the first sites in Europe to have it installed.

"My team and I liked the idea of using a system that is relatively new and being constantly improved," explained Julian Stange, chief medical physicist at the clinic. "We're very happy with the results from IDENTIFY and the direction it's going. The Varian team is great to work with, support has been excellent."

Once IDENTIFY was installed at the clinic, the radiotherapists started using it for a few patients at a time, quickly increasing numbers as they learned the system, according to Mr. Stange. Within a couple of months, the treatment staff felt confident enough in IDENTIFY to eliminate the need for markers and tattoos. Recently, the clinic upgraded to IDENTIFY v3.0, which brings deeper integration with the TrueBeam platform such as providing automated beam hold treatments.*

"Nowadays we're using IDENTIFY for about 99% of our patients, any disease sites that require a CT scan," Mr. Stange added.

> "It's been a big game changer for us. We can perform treatments more smoothly than ever and have achieved all of our implementation goals: increased accuracy, efficiency, and patient safety."

About 70% of the clinic's cases are either prostate or breast cancer, with the remainder being mostly palliative bone metastases and some less common cancers. IDENTIFY has helped streamline workflows since it performs many of the tasks previously carried out manually.

"IDENTIFY not only allows us to position patients faster, but we no longer have to redo imaging as frequently," Mr. Stange explained. "For instance, we recently reduced the number of cone-beam CT scans for prostate patients from daily to three times a week."

Study reveals improved metrics

To explore the benefit of IDENTIFY for workflow efficiency, set-up times for 39 fractions of breast and prostate patients positioned with IDENTIFY were compared to set-up times for a group of 23 fractions of breast and prostate patients positioned with tattoos at another site in the network. The set-up times were recorded using a stopwatch from the moment the patient was positioned on the couch to the moment the therapist removed their hands from the patient.

Results indicate that setting up with IDENTIFY saves a median 47s (59%) per treatment, compared to the set-up with tattoos. Moreover, the set-up time histograms show a substantial shift to the left when positioning with IDENTIFY, indicating time savings across the board (see figures 1 and 2).

Unpaired t-tests demonstrate statistically significant ($p<0.0001$) shorter set-up times when IDENTIFY was used, for both breast and prostate patients. The time saving achieved using IDENTIFY enables the team at Horb am Neckar to easily fulfill their target of approximately 50 patients per day.

Comparison set-up time IDENTIFY vs tattoos

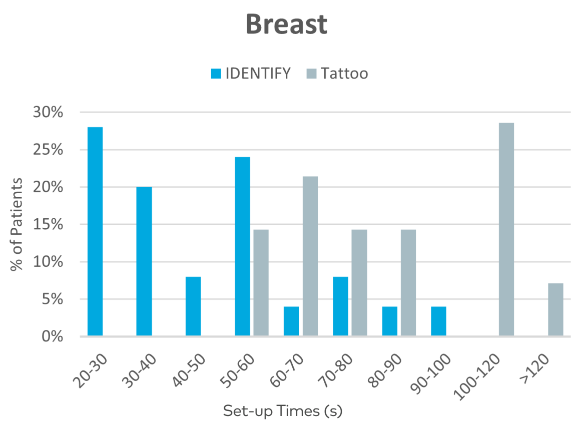

Figure 1: Histogram of breast set-up time (IDENTIFY system versus tattoos)

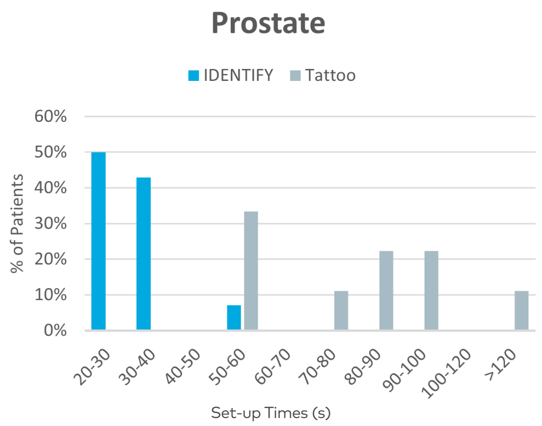

Figure 2: Histogram of prostate set-up time (IDENTIFY system versus tattoos)

Table 1: Breast set-up time (seconds), comparing IDENTIFY with tattoos

Breast	SGRT	Tattoo
Median set-up time	41	77
Maximum set-up time	96	147
Minimum set-up time	23	54

Table 2: Prostate set-up time (seconds), comparing IDENTIFY with tattoos

Prostate	SGRT	Tattoo
Median set-up time	30	84
Maximum set-up time	57	129
Minimum set-up time	22	50

Table 3: Overall set-up time (seconds) for breast and prostate combined

Breast & Prostate	SGRT	Tattoo
Median set-up time	33	80
Maximum set-up time	96	147
Minimum set-up time	22	50

Improved positioning accuracy

Another important benefit of IDENTIFY v3.0 lies in its integrated treatment delivery beam-hold feature, which automatically turns off the beam when the patient moves out of established thresholds.

"The automatic beam hold feature gives us a lot of confidence in our treatment setup as it recognizes minute movements that we don't spot with our eyes, and it reacts immediately," Mr. Stange explained. "All of this translates to reducing unnecessary dose to patients from imaging, improved accuracy, and reduced margins."

The team also investigated the accuracy of positioning with IDENTIFY in a different cohort of prostate and breast cancer patients. The magnitude of couch shifts based on verification imaging were calculated using IDENTIFY versus their conventional tattoo-based method. Prostate cancer patients were imaged with CBCT, while breast cancer patients were imaged with either CBCT or 2D kV-imaging.

Data collected from the clinic on positioning accuracy with and without IDENTIFY indicate that IDENTIFY set-up is at least as accurate as conventional tattoo-based set-up, for both breast and prostate patients. For breast patients, the team measured an average couch shift of 0.47 cm for patients positioned with IDENTIFY, and 0.54 cm for the tattoo-based set-up. For prostate patients, the team saw an average 0.38 cm in couch shifts for patients positioned with IDENTIFY, compared with 0.53 cm for the tattoo-based set-up (see tables 4 and 5).

Table 4: Positioning accuracy with respect to imaging for breast patients (collected from 209 treated fractions).

Averaged absolute difference of final online matched position and initial couch position (cm)	SGRT set-up	Tattoo set-up
Vertical	0.26	0.31
Longitudinal	0.19	0.30
Lateral	0.34	0.33
Magnitude	0.47	0.54

Table 5: Positioning accuracy with respect to imaging for prostate patients (collected from 256 treated fractions).

Averaged absolute difference of final online matched position and initial couch position (cm)	SGRT set-up	Tattoo set-up
Vertical	0.20	0.21
Longitudinal	0.13	0.30
Lateral	0.29	0.38
Magnitude	0.38	0.53

Patient comfort feedback

Patients also appreciate the intuitive visual coaching device for deep inspiration breath-hold treatments, complimenting the system for the peace of mind it affords them.

"By visualizing breathing instructions—when to breathe in and out, how deep, and for how long—IDENTIFY makes it easier for patients to follow the instructions," Mr. Stange said. "This in turn makes it easier for our radiotherapists to focus on delivering the best, most accurate treatment."

Focus on best possible patient care

Streamlined workflows, an easy-to-use user interface, surface management tools, and other advanced features in IDENTIFY are among the many benefits that staff at the clinic say are making it easier for them to deliver the best possible care for patients.

"The team is extremely pleased with everything IDENTIFY offers us, especially the radiotherapists who completely trust the system for positioning and enjoy more positive interactions with patients who don't complain about tattoos and markers," Mr. Stange added. "We all recommend that every site gets the system sooner rather than later because it makes treatment easier and safer."

"My advice to anyone considering implementing IDENTIFY is to go step by step and be prepared for change," Mr. Stange said. "Like any new approach, it's a process that can take some getting used to, but once you build your confidence in the system and start seeing the efficiency, safety, and accuracy gains that we've experienced, you'll wish you did it sooner!"

If you would like to learn more about IDENTIFY, please visit the **IDENTIFY webinar series**. The work of the team at **Horb am Neckar** is further described, alongside the clinical experiences with IDENTIFY of other sites across the globe.

The statements by Varian's customer described here are based on results achieved in the customer's unique clinical setting. Because there is no "typical" clinical setting and many variables exist, there is no guarantee that other customers will achieve the same results.

*Only available on TrueBeam, Edge, and VitalBeam systems equipped with Motion Management Interface (MMI).

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