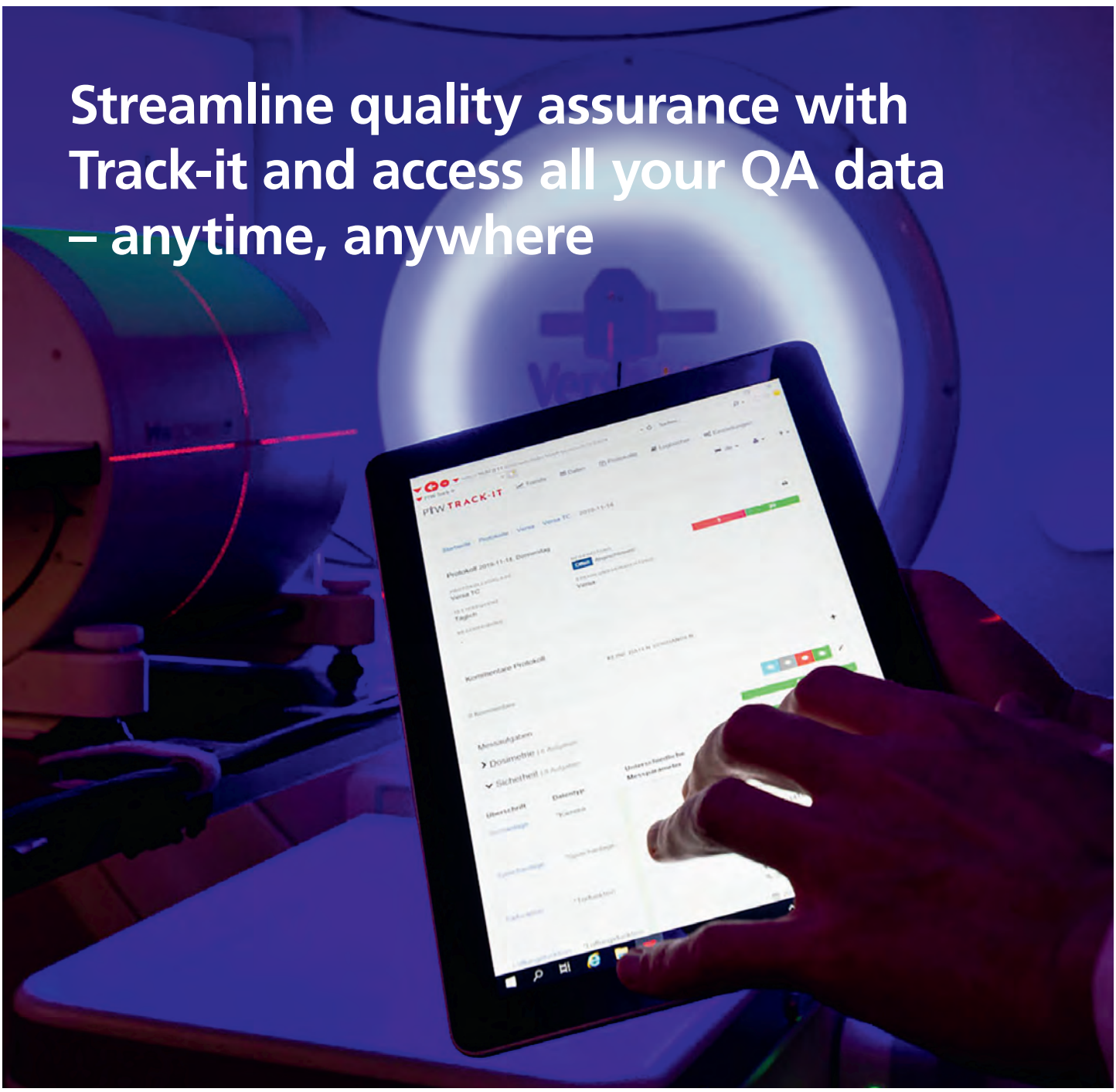
A User's View

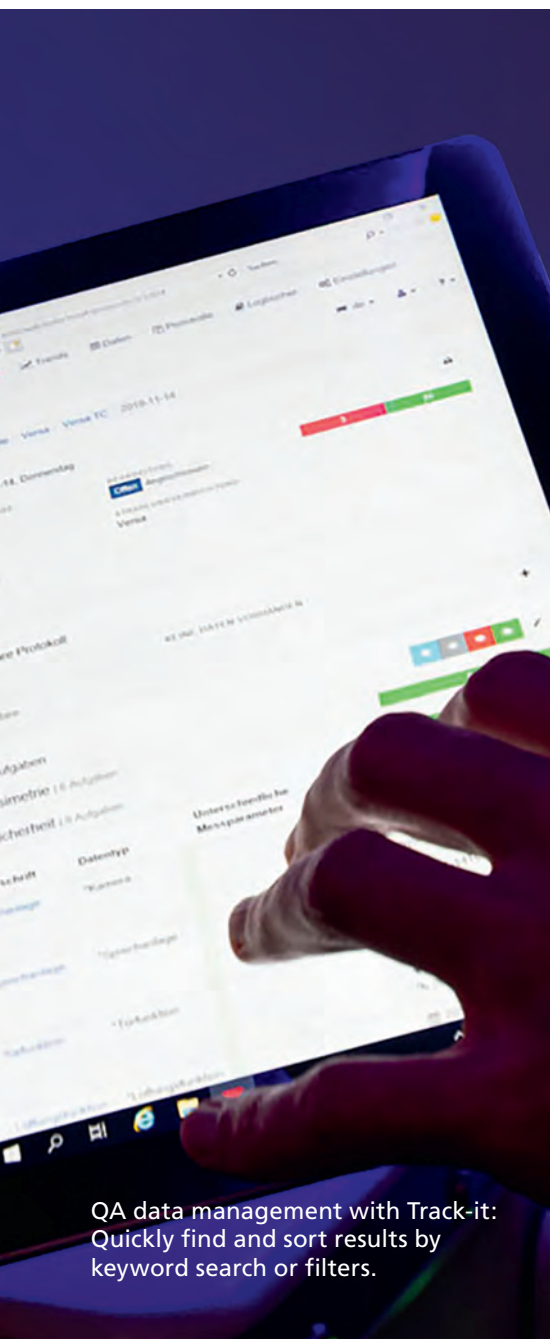
February 2020

Implementation and use of Track-it data management software for quality assurance in radiation therapy: A user experience

by Sebastian Wellner,
Medical Physicist at the
Marien Hospital Düsseldorf



Streamline quality assurance with Track-it and access all your QA data – anytime, anywhere



QA data management with Track-it: Quickly find and sort results by keyword search or filters.

Any medical physicist who has prepared the annual audit of a linear accelerator knows the time and effort involved in this process: The QA reports of up to 600 measurement tasks must not only be documented in a reproducible manner, but also be complete and easy to find regardless of whether they are available digitally or in paper form. The acquisition and compilation of annual tasks is not the only challenge however – monthly, weekly and daily quality assurance (QA) tasks also demand a great deal of time and effort.

Many data are still partly handwritten, available only in hard copy form and distributed at different locations as well as stored in different forms and on different media. In many cases handwritten entries cannot always be deciphered easily. It is also very time intensive to change test procedures, because changes must be made in all existing protocol templates. If an error message occurs on a linear accelerator, the question of whether this error has already occurred before can usually only be answered after careful scrutiny of the linear accelerator's paper logbook. For the same reason subtle but important changes in tolerances and deviations from expected values can easily go undetected.

To address these challenges, PTW has developed the browser-based Track-it data management platform, which is accessed through the local area network of the hospital or doctor's office. All QA data from different sources can be documented, monitored and accessed at any time using any WiFi-enabled device. Measurement data from different devices can be imported directly into Track-it or via an open XML interface, and historic data can also be added.

A practical tool for the annual audit – but also for daily clinical routine

In Track-it, QA data is provided in a structured, readable format, visible and accessible at all times. This not only considerably reduces the time required for the annual audit, but the data management platform also helps to streamline the daily workflow. Individual measurement results as well as entire measurement series can be retrieved quickly and easily by convenient search functions or by setting filters, for example, by date, keyword or specific parameters. The selection of templates saves time and greatly improves the daily QA workflow.

Deviations can be easily identified by the trend function

The trend function in Track-it can be used to track and monitor machine-specific parameters at a glance. This makes it possible to quickly determine whether the values remain constant over time. If deviations from expected values exist (over weeks or months for instance), these can be visualized and quantified. Measurement results of multiple devices can be displayed in one single plot, so deviations between different and/or several radiation devices can also be identified more easily. If deviations are detected in good time, appropriate interventions can occur before critical values are reached.

Case Study Marien Hospital Düsseldorf, Germany

QA data complete, compliant and available at any time in a single database that can be tailored to individual clinical needs:
Medical Physicist Sebastian Wellner on the implementation, use and clinical benefit of Track-it

Why we chose Track-it

Before Track-it was introduced, the QA data recorded in our hospital consisted of a mixture of paper files and Word or Excel files stored on network drives. If some or all of this data is not available digitally, it is difficult to keep track of QA reports and documentation in everyday work, for instance, which daily or weekly QA tasks are still pending, and which ones have already been completed?

In addition, the annual audit also involves a lot of work: A significant amount of time is spent on searching through files and computers beforehand to get all the data ready for the audit.
Our main motivation in introducing Track-it was to simplify daily operations: to have all QA data in a central database, structured and available at all times, so we can access it easily and be kept updated quickly.

Hospital Profile

Marien Hospital Düsseldorf
Clinic for Radiation Oncology and Radiology,
Member of the Catholic Hospital Group Düsseldorf

- **Radiation equipment:**
  3 linear accelerators
  1 intraoperative irradiation unit
  1 brachytherapy unit
- **Medical Physics Department:**
  6 medical physicists
  2 student assistants
- **Use of Track-it:**
  since August 2018
- **Number of Track-it licenses:**
  1
- **Measuring devices:**
  2 Quickcheck webline
  1 Octavius 4D with Octavius Detector 729
  1 MP3 3D water phantom
  1 EPID QC Phantom
  Various PTW detectors

How we implemented Track-it

“Track-it is a great help for us, because all QA data are clearly displayed and different users can access it at any time and from any location.”

Before implementing Track-it, we had the software demonstrated by the manufacturer and were immediately impressed by its potential and ease of operation. The implementation in August 2018 proceeded quickly thanks to good support from our IT department and close support from the manufacturer – installing and setting up Track-it took approx. one day.

The protocol template for the daily check was set up within one day. As a result, the first part of the commissioning was completed very quickly. In the following months, we gradually added more protocols to Track-it. After a short period of getting used to Track-it, we found it very pleasant to use, and all team members had no problem using it from the start.

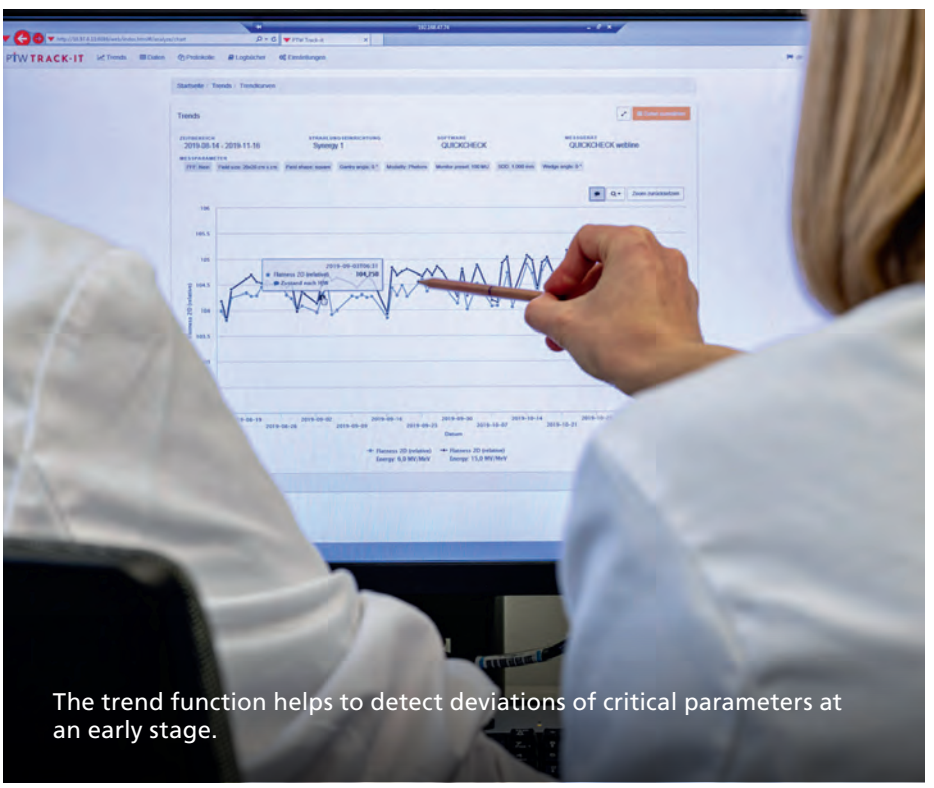
Why Track-it convinced us in day-to-day work

We have been using Track-it every day since installation. At the beginning, we included the most important protocol, the daily check, in our daily routine. The measurement results can be quickly collected in the database and are automatically structured, readable and compliant to standards. It is now much easier for us to maintain an overview. Since all necessary data are stored uniformly, we can see at one glance which QA tasks have already been completed and which are still pending. As a result, not only daily QA tasks but also monthly and semi-annual tests are now accomplished much more conveniently and efficiently.

Because the data management platform is browser-based, it can be accessed and operated by any authorized user and with any WiFi-enabled device, whether PC or tablet. During the morning check, we access the database and make entries via a tablet, for example. We can even use Track-it in the treatment room, which is a big advantage.

Track-it Fact Sheet

- All QA data in a central platform, accessible at any time via PC/tablet, etc.
- Flexible, open structure – easy to adapt to individual needs
- Quick access to information on different radiation devices
- Trend function for constancy checks: identify deviations before they become a problem
- Easy to update in case of changes in test procedures



The trend function helps to detect deviations of critical parameters at an early stage.

Personal

Sebastian Wellner, Medical Physicist, Marien Hospital Düsseldorf, Clinic for Radiation Oncology and Radiology

- 2008 – 2011: Training as an MTRA (radiologist/dosimetrist) at the University Hospital Münster
- 2011 – 2017: Studied Medical Physics at the University of Düsseldorf
- 2019: Accreditation as a Medical Physics Expert (MPE) at Marien Hospital Düsseldorf

If there is no connection to the network, we can enter the data offline. As soon as you leave the vault and have access to the network again, the data are automatically transferred to the server and into Track-it. This is much more convenient than before when the data had to be recorded in the vault, but entered on a computer outside the vault.

We perform constancy checks with the trend function of Track-it. To monitor critical parameters and to know at an early stage whether certain measured values are running out of tolerance, we create a trend plot with just a few mouse clicks. This helps us to recognize at an early stage when values are moving toward our internally defined tolerance limits, which are even more stringent than the national DIN requirements. This gives us a double safety buffer and enables us to take appropriate action in good time before there is any risk of violating the chosen protocol.

We are increasingly using the digital logbook function in Track-it, but not yet taking full advantage of it. This is because only the medical physics team currently has access to the Track-it platform. We are, however, planning to set up access for our radiologists/dosimetrists (MTRA), assigning one of the various access permissions available. Both entries and attached service documents, e.g., operating instructions, can be stored in the digital logbook and be viewed at any time. The effectiveness of this facility was illustrated recently when electron radiation from one of our accelerators triggered an error message: The service engineer asked if this problem had already frequently occurred. The digital logbook function allowed us to find relevant entries on that issue much more rapidly than if we had to use our historic method of interrogating paper-written logbooks. Additionally, many service technicians only send service records as PDF files – these can now be attached to the digital logbook in Track-it and therefore be found immediately.

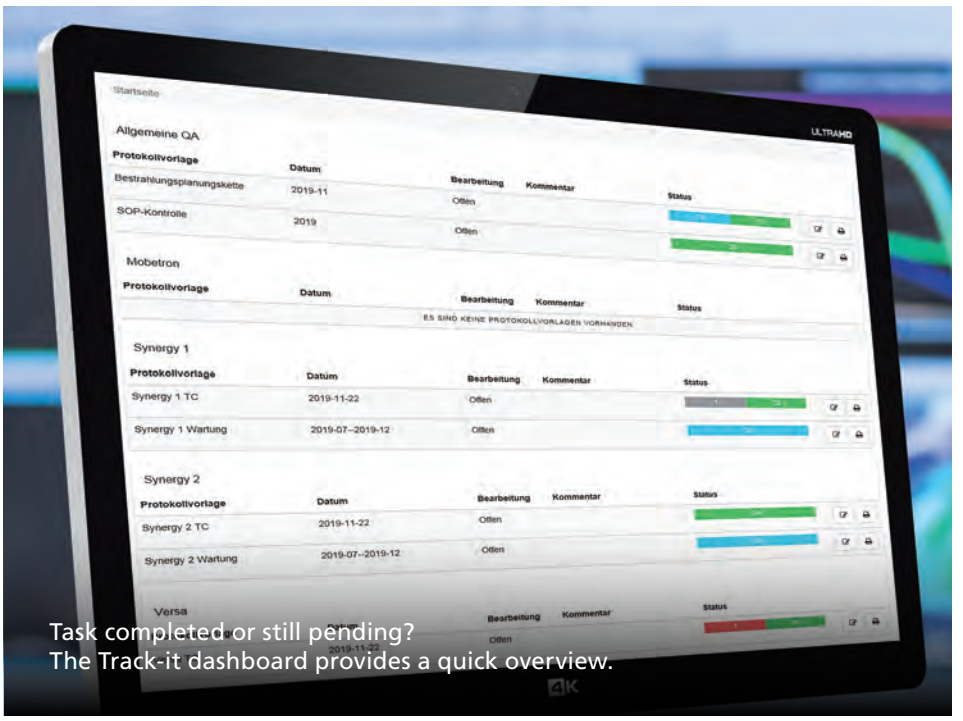
If test procedures change due to new regulations, the data management system provides a further advantage. Implementing these changes involved a lot of work for us previously, but it's pretty simple with Track-it. The protocols stored in the database are created via templates, which can be easily changed or adapted to new requirements. The new version becomes immediately available for use after approval. Although protocol templates that have already been used for measurements cannot be changed, they can be saved as a copy and then edited.

Tips & Tricks

The support from our IT department has proven to be a great advantage during the implementation of Track-it. We therefore recommend to involve the IT department of the hospital in the planning and implementation process right from the start.

Individual measurement results can be easily found in Track-it by keyword search or by setting filters. Filters composed of different search parameters can be saved. This means that we do not have to create them from scratch every time we make a new query.

The open design of Track-it allows us both to integrate third-party data and adapt or further develop the database platform for our own purposes. Someone in the team who has a special interest with database technology can easily become familiar with Track-it functionality, and consequently much more potential can be realized. In our hospital, for example, we are now using Track-it for general QA tasks beyond what one might call 'typical', because they are not assigned to a single radiation device, but affect an entire department or several radiation devices. For example, we have created a separate protocol for the annually required update of the SOPs (Standard Operation Protocols) to remind us once a year that this review still needs to be completed. We also schedule the update process of all work instructions via Track-it, which we are required to conduct on an annual basis. We also use Track-it for the now legally required monthly monitoring of the treatment planning chain, which is also not assigned to any particular accelerator. We have set up the complete measurement protocol in Track-it, including work instructions. Although this required a considerable amount of work initially, it functions very well and now makes our work much easier.



Task completed or still pending?
The Track-it dashboard provides a quick overview.

When creating tasks in a protocol template, an entry must always be assigned from the list of data types. Data types of PTW measuring devices are automatically recognized by Track-it during the first data transfer and automatically added to the database. However, if data from third-party devices or individual data types are used for measurement tasks that are not yet available in the system, it is important to add the new data types before creating the protocol templates.

"When QA procedures change due to new regulations, it has been very time consuming for us to update everything. With Track, it's now pretty simple."

Brief and to the point

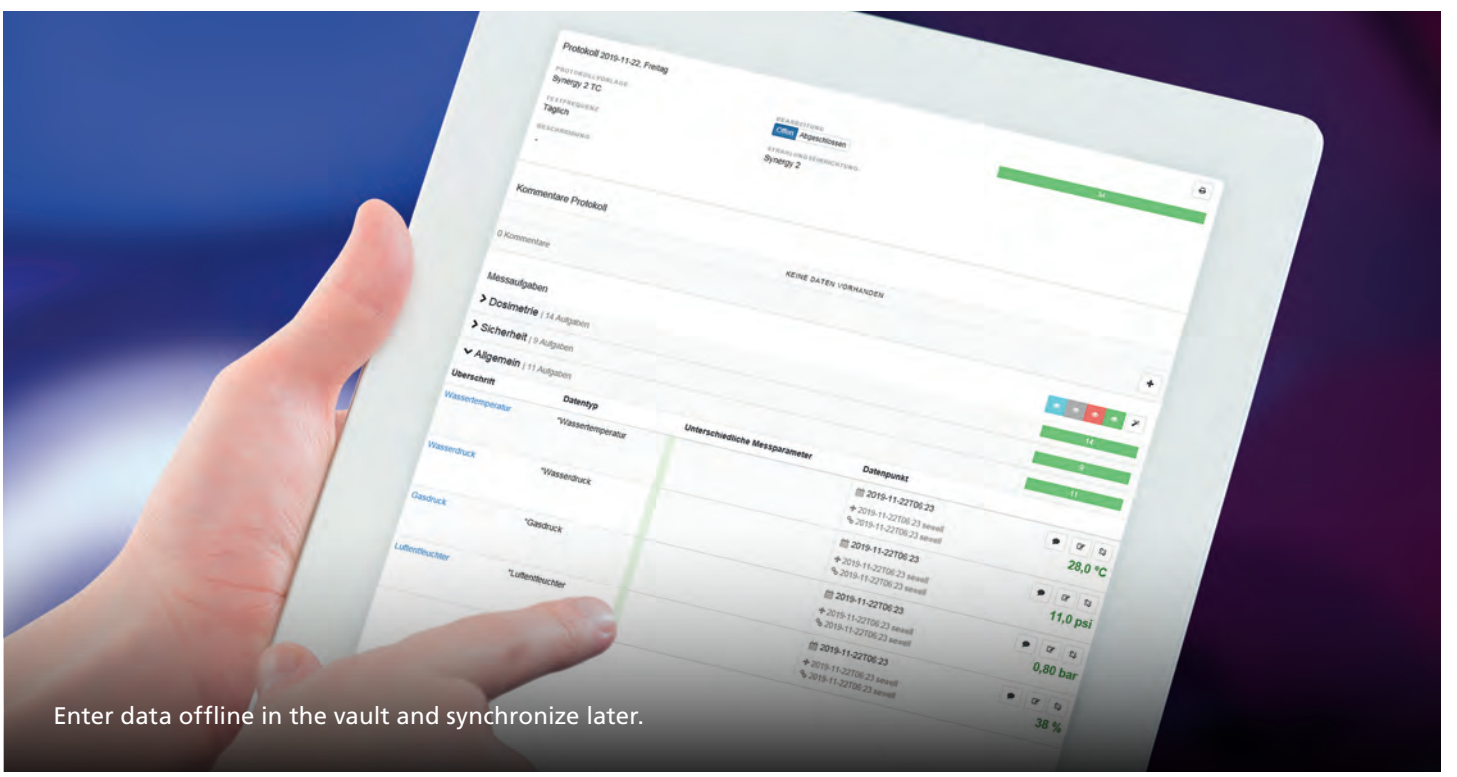
Track-it is a data management platform that enables new or existing QA data to be documented, monitored and retrieved in compliance with national and/or internal standards. Since the software platform is browser-based, all data are available to any number of authorized users at any time and anywhere within the clinical network and can be easily accessed via any network-enabled device. Measurement results can be displayed with just a few mouse clicks via the search function or by setting filters.

The trend function enables us to understand and compare parameters at a glance. This makes it possible to quickly detect critical deviations and take appropriate action before they violate standards.

A digital logbook makes it possible to store and quickly retrieve service and maintenance files of radiation devices, such as manuals or test reports as well as notes. The open, flexible design of Track-it also allows us to adapt protocol templates to the individual needs of our hospital and even use them for other QA tasks.

Outlook for the future

We believe that Track-it will make paper documentation on our linear accelerators superfluous in the near future. The old files must be kept according to legal requirements, but new ones are unlikely to be added. For this to work, we plan to set up additional access to Track-it for our radiologists/dosimetrists (MTRA) in the future. This would make it possible for them to make entries into the digital logbook, so a paper logbook would no longer be needed. All information recorded in the logbook will then be fully available to all – clear, concise and digital.



Enter data offline in the vault and synchronize later.

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Imprint

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