

SunCHECK™

Independent QA. Your Way.



SUN NUCLEAR
corporation

Integrated. Independent.

Radiation oncology departments are busy. In pursuit of Patient Safety, medical physicists manage complex processes, complicated machines, and high expectations for overall treatment quality. SunCHECK™ simplifies and standardizes how they balance it all – **with full integration and independence intact.**

It's about time.

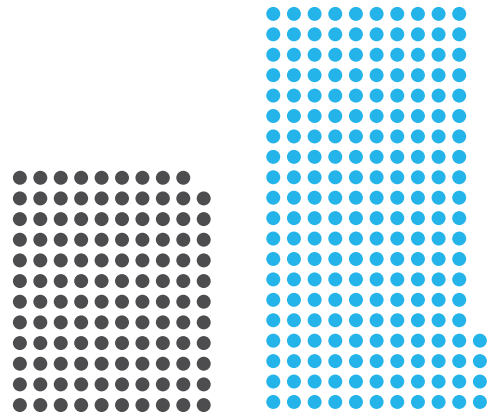
In the last 30 years, countless new radiation therapy modalities and treatment techniques have been embraced. Independent QA tools have kept pace, but they've arrived as separate packages – designed for specific tasks, with unique software, databases and workflows to learn.

With demands for increased patient throughput, improved quality of care and reduced operational costs, every minute counts. And, with Patient Safety on the line, shortcuts are not an option.

SunCHECK provides flexible workflow automation for fully integrated and independent QA.

Integrated QA provides standardization and workflow efficiency to get the job done. **Independent** QA provides unbiased assurance that treatment and machine issues will be caught.

It's what radiation therapy needs, and it's ready for you.



119

204

Globally, nearly **119 million** treatment fractions were treated in 2012. By 2035, that number is expected to jump to at least **204 million** per year.

*Lancet Oncology Commission,
September 2015*



Platform



Patient



Machine

Centralized. Standardized.

For more than 600 sites worldwide, SunCHECK has helped change the way they perform QA.

Single-linac centers and networks alike use the SunCHECK Platform to:

- Reduce process steps
- Produce clear results
- Reduce machine downtime
- Generate reports to make their lives easier

SunCHECK brings consistency and convenience to critical tasks – all within a common framework, and operating on a single database.

“It can be difficult to get different pieces of radiotherapy equipment, databases and patient information systems to interact. Sun Nuclear has managed to integrate these information flows into a single platform.”

Robert Biggar, M.Sc., Clatterbridge Cancer Centre, UK



Platform

- One Solution for Radiation Therapy QA
- Speed and Efficiency through Automation
- Access from Anywhere
- Seamless Clinical Integration



Patient

- Physics and Dosimetric Plan Checks
- Secondary Checks
- Phantomless and Array-Based Pre-Treatment QA
- In-Vivo Monitoring



Machine

- Daily, Monthly, Annual QA
- Measurement Device Connectivity
- Imaging, VMAT, MLC QA



SunCHECK™

Apply the Platform

Like all Sun Nuclear solutions, SunCHECK is independent. It's designed from the ground up to support the real world of radiation therapy – where every combination of OIS, TPS, linac and clinical implementation is unique.

SunCHECK's purpose is Patient Safety.

With **SunCHECK**, you have a fully independent, integrated workflow.

- **One Solution for Radiation Therapy QA**
Manage all Patient and Machine QA in the same place to save time and reduce the likelihood of errors going undetected.
- **Speed and Efficiency through Automation**
Cut time consumed by manual tasks, and build in more bandwidth for data analysis, clinical decisions and continuous improvement.
- **Access from Anywhere**
Untether your team with secure, browser-based visibility to the insights they need to see, wherever they are.
- **Seamless Clinical Integration**
Make your QA work harder, regardless of technologies in place. Count on custom installation, with a quick start-up guaranteed.

FEATURE IN FOCUS: DASHBOARD

The screenshot displays the Sun Nuclear Corporation dashboard, which is divided into two main sections: Patient Worklist and Machine Worklist. The top navigation bar includes a home icon, user profile, and system status, along with the Sun Nuclear Corporation logo and version information (Admin Admin 2.2.0.12014).

Patient Worklist (Pa): This section features a search bar for Patient Name or ID, filters for Fraction 0, Treatment Site, Machine, and Date Range. It displays a table of Recent Patient Events with columns for DATE, PATIENT, PLAN, and ACTIONS. The table lists various treatment events with their respective dates, patient names, and plans, each accompanied by a status icon (green checkmark or red exclamation mark) and an 'Approve' button.

Machine Worklist (Ma): This section includes filters for Machine and Date Range, and a link to the 'SNC Routine Quick Start Guide'. It is divided into three sub-sections:

- Due:** A table with columns for DATE, MACHINE, TEMPLATE, STATE, and ACTIONS. It lists upcoming or overdue treatments, such as Halcyon, Tomotherapy, and SNCM TrueBeam, with their respective dates and states (Overdue, Completed).
- Pending Review:** A table with columns for DATE, MACHINE, TEMPLATE, STATE, and ACTIONS. It shows treatments that require review, such as HDR, GE Lightspeed, and Tomotherapy, with their dates and states (Completed).
- Approved:** A table with columns for DATE, MACHINE, TEMPLATE, STATE, and ACTIONS. It lists approved treatments, such as SNC Routine, with their dates and states (Completed).

Get an overall view of Patient and Machine QA, with quick access to results, reviews, to-do's and approvals. Verify QA has been completed successfully, and on-time.

“Being able to really see the whole system in one location is a huge advantage. Having patient information, having machine information all in one easily accessible place... that’s basically what you would want in a system.”

Robert Staton, Ph.D., UF Health Cancer Center at Orlando Health, U.S.

SunCHECK™ Patient

Prioritize Your Patients

Trade time spent moving, saving and searching for files for greater focus on improving treatment quality.

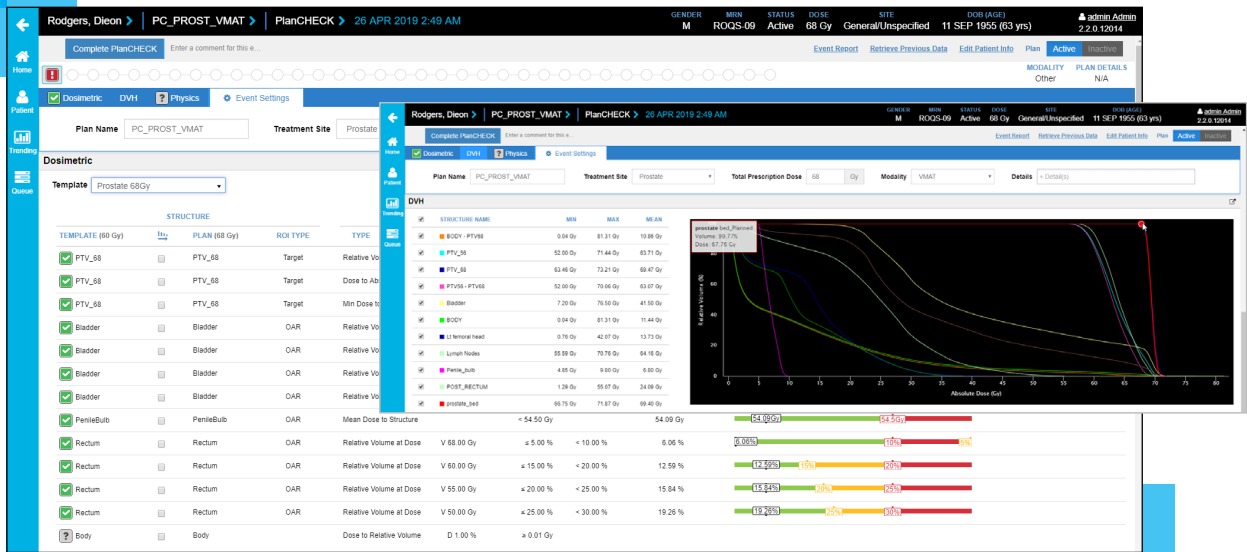
With **SunCHECK Patient**, all phases of Patient QA integrate into a flexible, automated and seamless workflow.

- **Physics and Dosimetric Plan Checks**
Automate plan quality verification and reporting workflows.
- **Secondary Checks**
Perform 3D secondary dose calculation for the systems your clinic uses.
- **Phantomless and Array-Based Pre-Treatment QA**
Complete your 2D/3D pre-treatment QA, with both EPID measurement and log file-based options.
ArcCHECK® device connectivity provides array-based pre-treatment QA, an efficient audit QA solution, and improved root-cause analysis of delivery issues.
- **In-Vivo Monitoring**
Verify and track dose throughout your patients' courses of treatment.

“Because this system is fully automated so that no physicist time is required for data acquisition and evaluation, daily patient treatment QA is feasible.”

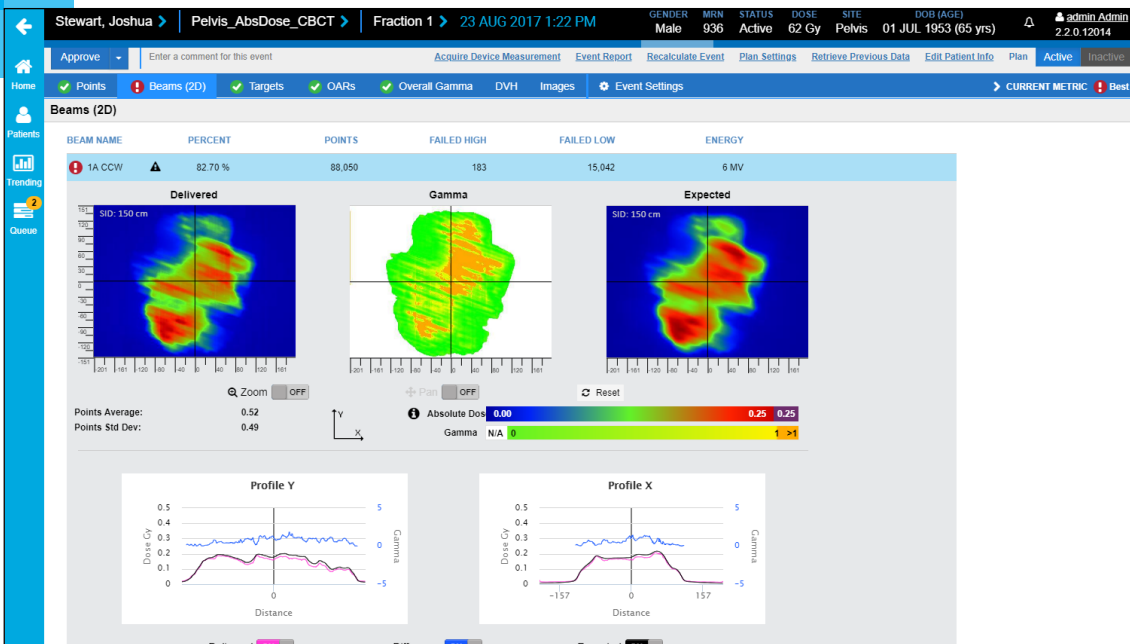
Zhuang AH, Olch AJ., J Appl Clin Med Phys (2018)

FEATURE IN FOCUS: PlanCHECK™ MODULE



Validate the treatment plan against departmental requirements, and automatically assess performance versus intent. More than 60 rules-based Physics Checks and comprehensive structure-based Dosimetric Checks are included.

FEATURE IN FOCUS: TRANSIT DOSIMETRY



Verify setup, first fraction, and intra-fraction motion (when in EPID mode) against the plan. Patient position and anatomy are factored into the analysis for true dosimetric In-Vivo Monitoring.

SunCHECK™ Machine

Get More from Your Machines

Improve standardization and ease compliance reporting for Daily, Monthly and Annual QA.

With **SunCHECK Machine**, you drive efficiency and critical consistency across locations, machines and staff. In turn, you are able to satisfy requirements of TG-142, TG-51, DIN and your internal requirements.

- **Daily, Monthly, Annual QA**
Ensure consistency among machines and clinics with shared tolerances. Apply ready-to-use, but customizable templates for efficient QA. No more spreadsheets!
- **Measurement Device Connectivity**
Eliminate the need for additional software and transfer of data. Automate beam measurement with direct device integration to Sun Nuclear's Daily QA™ 3 and IC PROFILER™. New PC Electrometer™ connectivity enables auto-population of chamber measurements.
- **Imaging, MLC and VMAT QA**
Simply deliver test beams. With acquired image or log file data, SunCHECK Machine automatically processes the data and analyzes results.



60 min

Without SunCHECK



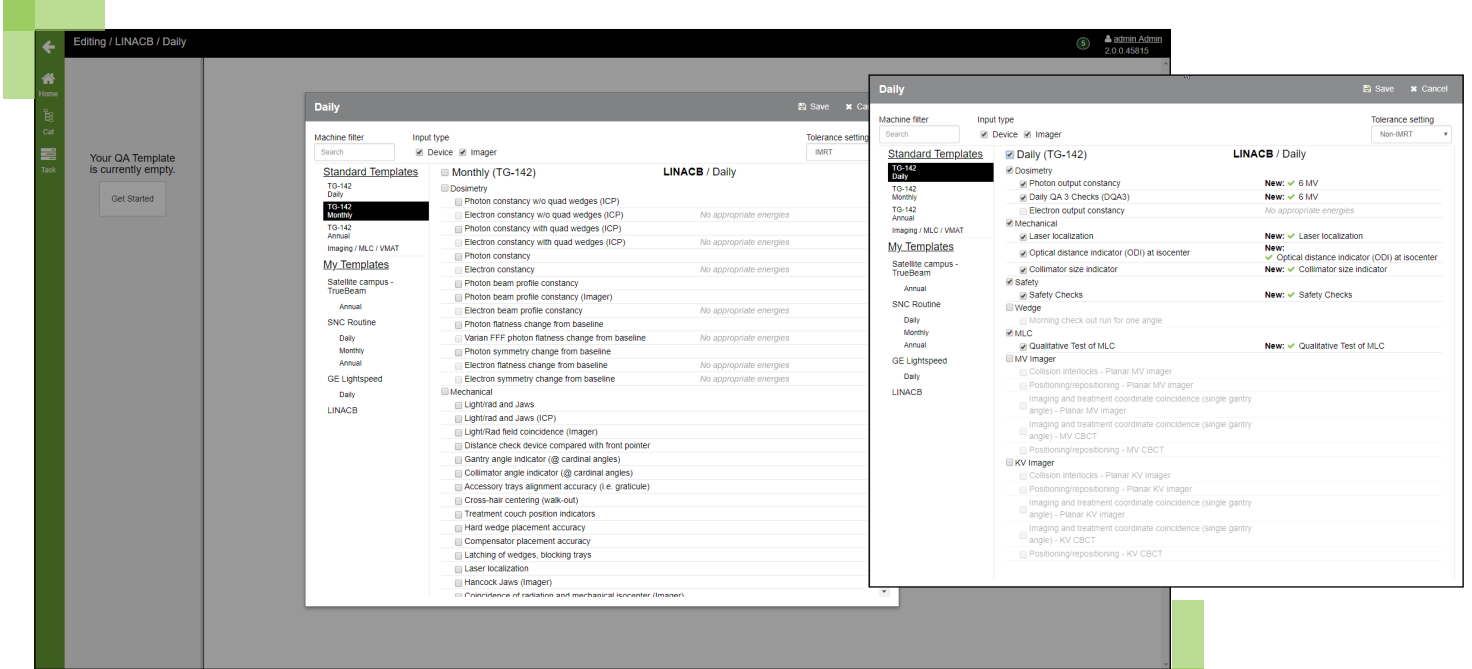
15 min

With SunCHECK

Monthly constancy and beam quality checks take only **15 minutes** for 5 beams with SunCHECK Machine vs. **60 minutes** without.

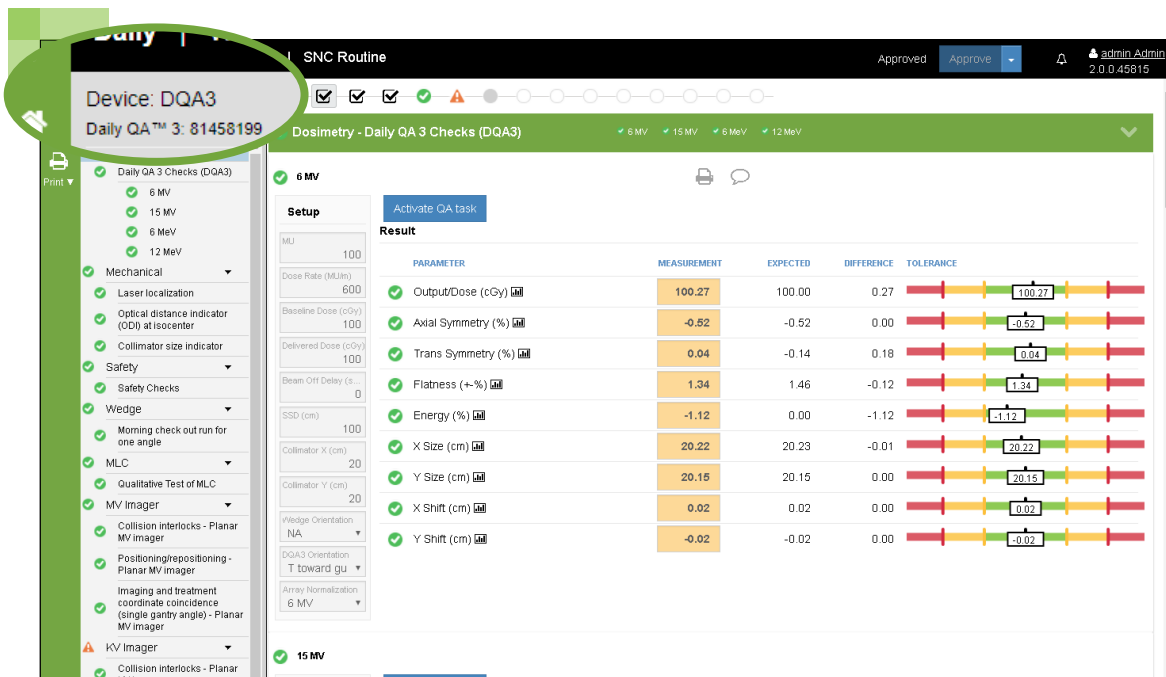
Sun Nuclear internal testing

FEATURE IN FOCUS: DEFAULT TEMPLATES



TG-142 and DIN pre-set templates by modality support Daily, Monthly and Annual QA. Easily customize templates and tolerances to fit your needs.

FEATURE IN FOCUS: MEASUREMENT DEVICE CONNECTIVITY



Auto-populate your Daily, Monthly and Annual QA results with direct connectivity to Daily QA 3, IC PROFILER and PC Electrometer devices, eliminating potential data entry errors.

SunCHECK Platform



Select Features	Practical Application
Action-oriented dashboard	<ul style="list-style-type: none"> • Overview of Patient and Machine QA actions <ul style="list-style-type: none"> - Results/review for patient data - Due, pending and approved Machine and Patient QA tasks • Easy approval mechanisms, right from the dashboard
Common navigation mechanisms between Patient and Machine workflows	<ul style="list-style-type: none"> • Consistent user experience across the platform

SunCHECK Patient



Select Features	Practical Application
New PlanCHECK Module <ul style="list-style-type: none"> • Physics Checks • Dosimetric Checks • Billing Compliance/Reporting 	<ul style="list-style-type: none"> • Automated workflows for treatment plan validation, with more than 60 rules-based checks • Easy identification of deviations with user-defineable pass/fail results • Automated, comprehensive structure-based checks, including dose/volume metrics compared to user-definable constraints • Quickly generate reports for patient chart and billing documentation
New ArcCHECK direct device integration	<ul style="list-style-type: none"> • Array based Pre-Treatment QA support, complementing phantomless offerings -- and providing optimal, unmatched flexibility for Patient QA • Efficient audit QA • Improved root cause analysis
Independent Patient QA for Varian Halcyon™ System	<ul style="list-style-type: none"> • First commercially-available solution for Halcyon secondary dose calculations • Log file-based Pre-Treatment QA • Log file-based In-Vivo Monitoring
Transit Dosimetry <ul style="list-style-type: none"> • 2D absolute dose for Fraction N • Streamlined calibration process 	<ul style="list-style-type: none"> • Fully independent absolute dosimetric QA of patient treatments, using only calibrated EPID data • Ability to verify setup and first fraction against plan (74% of errors occur in first fraction – Bojecho et al, Med Phys) • Patient position, movement and anatomy inherently included in analysis • Makes true dosimetric In-Vivo Monitoring clinically feasible • For European Union, supports required compliance with 2013/59/ EURATOM – Article 83
Universal Metrics <ul style="list-style-type: none"> • “Plug and Play” metrics - no customization needed • Use for each phase of Patient QA • May apply >1 metric set to QA simultaneously 	<ul style="list-style-type: none"> • Simpler, more automated assessment of all Patient QA results • Works relative to approved treatment plan, eliminating the need for adjustment or customization for each patient • Instantly analyze the impact of different metric criteria sets, including dose coverage and limits, and quickly switch criteria

SunCHECK Patient (cont.)

Select Features	Practical Application
Consistent Event Summary Display <ul style="list-style-type: none"> • Target and OAR gamma dose metrics displays in a single view • Across all phases of Patient QA 	<ul style="list-style-type: none"> • View Points, Beams, Targets, OARs, Overall Gamma, DVH, and Images in a single navigable view • Auto identification of Targets and OARs
3D secondary dose calculations for conventional linacs, Varian ICVI and BrainLab Stereotactic Cone Systems, Halcyon and Monte-Carlo based TomoTherapy® support	<ul style="list-style-type: none"> • Complete 3D secondary dose calculations for Halcyon and TomoTherapy in the same system used for conventional linacs <ul style="list-style-type: none"> - Eliminate need for standalone solution
3D TG-43-compliant HDR Brachytherapy secondary dose calculation support	<ul style="list-style-type: none"> • Complete 3D secondary dose calculations for HDR brachytherapy in the same system used for conventional linacs, Halcyon and TomoTherapy systems

SunCHECK Machine

Select Features	Practical Application
Comprehensive Daily, Monthly and Annual QA <ul style="list-style-type: none"> • Standard and complete TG-142 and DIN templates for Daily, Monthly, Annual QA • User-friendly editing or creation of customized QA templates/tasks • Share QA templates across machines and centers • Automated imaging, MLC, and VMAT QA task integration 	<ul style="list-style-type: none"> • Get up and running quickly with complete and detailed templates • No need for spreadsheets! • Reduce QA delays, contributing to increased Patient Safety • Set QA to standards, or customize to your own specific requirements • Ensure consistency across your enterprise
Daily QA 3, IC PROFILER and PC Electrometer direct device integration	<ul style="list-style-type: none"> • Perform beam measurements for certain Daily, Monthly and Annual QA tasks with a quick one-step process • Operate and save results in real-time--no uploads or file transfers
Fully TG-142/MPPG8 compliant	<ul style="list-style-type: none"> • Demonstrate compliance for accreditation purposes
Flexible data trending	<ul style="list-style-type: none"> • See if a given parameter is moving towards an out-of-tolerance condition • Opportunity for pro-active machine management
Centralized data storage and flexible reporting	<ul style="list-style-type: none"> • Easy report retrieval for accreditation/compliance audits • Meet documentation needs

Visit sunnuclear.com/suncheck to request your demonstration.

Supporting Publications

The evidence is mounting. Below are just a few publications that address workflow best practices for Patient Safety.



Sensitivity study of an automated system for daily patient QA using EPID exit dose images

Zhuang AH, Olch AJ., J Appl Clin Med Phys (2018)



Validation of a GPU-Based 3D dose calculator for modulated beams

Ahmed et al., J Appl Clin Med Phys (2017)



Do Task Group External Beam QA Recommendations Guarantee Accurate Treatment Plan Dose Delivery?

A Templeton et al., Med Phys., 42 (3395-3396) (2016)



A hybrid volumetric dose verification method for single-isocenter multiple-target cranial SRS

Ahmed, et al., J Appl Clin Med Phys (2018)



Can a commercially available EPID dosimetry system detect small daily patient setup errors for cranial IMRT/SRS?

Hsieh et al., PRO Journal (2016)



In Vivo dosimetry using CBCT and EPID device; analysis of sources of errors in VMAT Treatments

S. Bresciani et al, ESTRO 2019



Report No. 142 - Task Group 142 report: Quality assurance of medical accelerators (2009)

AAPM

Visit [sunnuclear.com/publications](https://www.sunnuclear.com/publications)
for up-to-date peer-reviewed articles.

Implementation Support

From upfront requirements analysis and goal definition through clinical adoption, our SunDEPLOYS™ program ensures a successful SunCHECK Platform introduction.



Project Management and Site Planning

Your dedicated SunDEPLOYS team works side-by-side with you to meet your clinical and operational goals, and help your staff bring SunCHECK into routine clinical use.



System Preparation

A pre-training phase, System Preparation is focused on ensuring readiness at the time of on-site training and education, based on your clinic's or network's unique needs and SunCHECK configuration.



Training and Go-Live Support

Your SunDEPLOYS team creates a site-specific training curriculum, ensuring confidence among all members of your team. Go-live support ensures user proficiency, full clinical adoption and routine use of targeted SunCHECK functionality.

SunCHECK™

Used by 600+
Clinical Sites Worldwide



Platform



Patient



Machine

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