# 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.

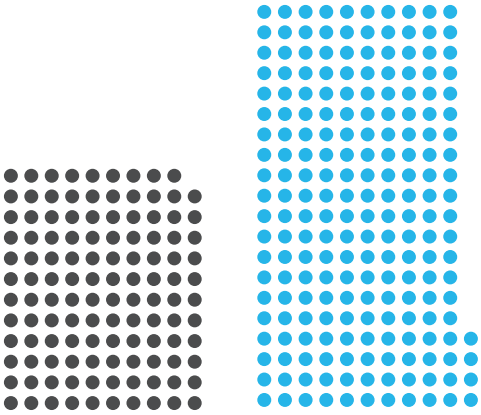
In the last 30 years, countless new radiation therapy modalities and treatment techniques have been embraced. Independent QA tools have kept pace, but they've arrived as separate packages – designed for specific tasks, with unique software, databases and workflows to learn.

With demands for increased patient throughput, improved quality of care, remote workflow capabilities and reduced operational costs, greater integration is essential. 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.




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*

# Centralized. Standardized.

## For more than 900 sites worldwide, SunCHECK has helped change the way they perform QA.

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

- Reduce process steps
- Produce clear results
- Reduce machine downtime
- Generate reports for easy reporting and compliance

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

*"As a department treating many patients daily, keeping organized and working efficiently are extremely important. For this reason, we use SunCHECK as a single source of management of our QA data."*

*Christopher Bowen, M.S., DABR,*
*Mosaic Life Care at St. Joseph, U.S.*

## 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.

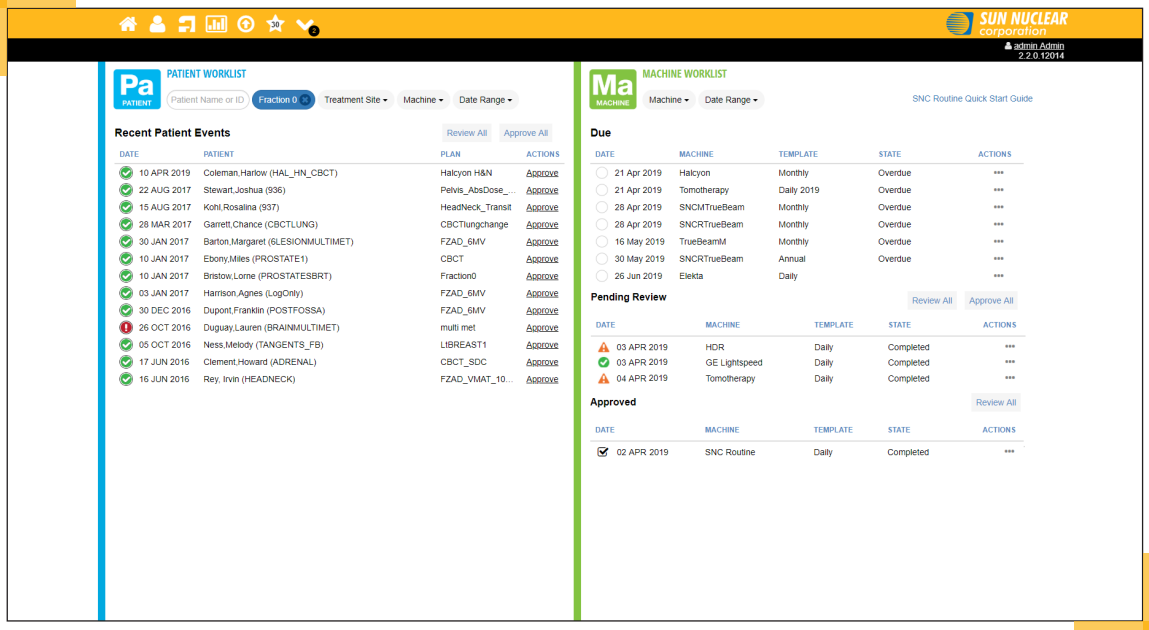
**SunCHECK's purpose is Patient Safety.**

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 undetected errors.
- 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
  Whether on-site or at home, your team gains secure, browser-based visibility to the insights they need to see, when they need it.
- Seamless Clinical Integration
  Make your QA work harder, regardless of technologies in place. Count on custom installation, with a quick start-up guaranteed.

SEE MORE **FEATURES** ON
PAGES 12-13

## FEATURE IN FOCUS:
DASHBOARD




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.

*"The homepage provides a clear overview of the QA tasks — due, pending review, or approved. For each task, calculation and analysis occur automatically in the background to give you automated results and alerts."*

*Evy Bossuyt, M.S., Iridium Kankernetwerk, Belgium*

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."*

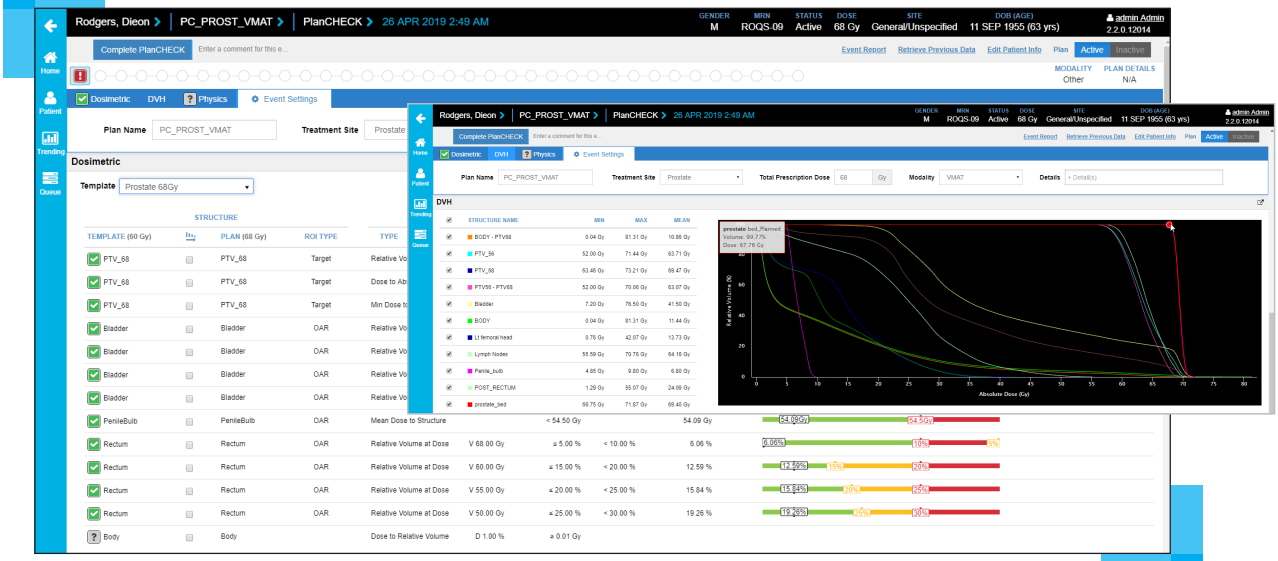
*Zhuang AH, Olch AJ., J Appl Clin Med Phys (2018)*



*Depicted names of individuals within user interface images above are fictitious and randomly generated.*

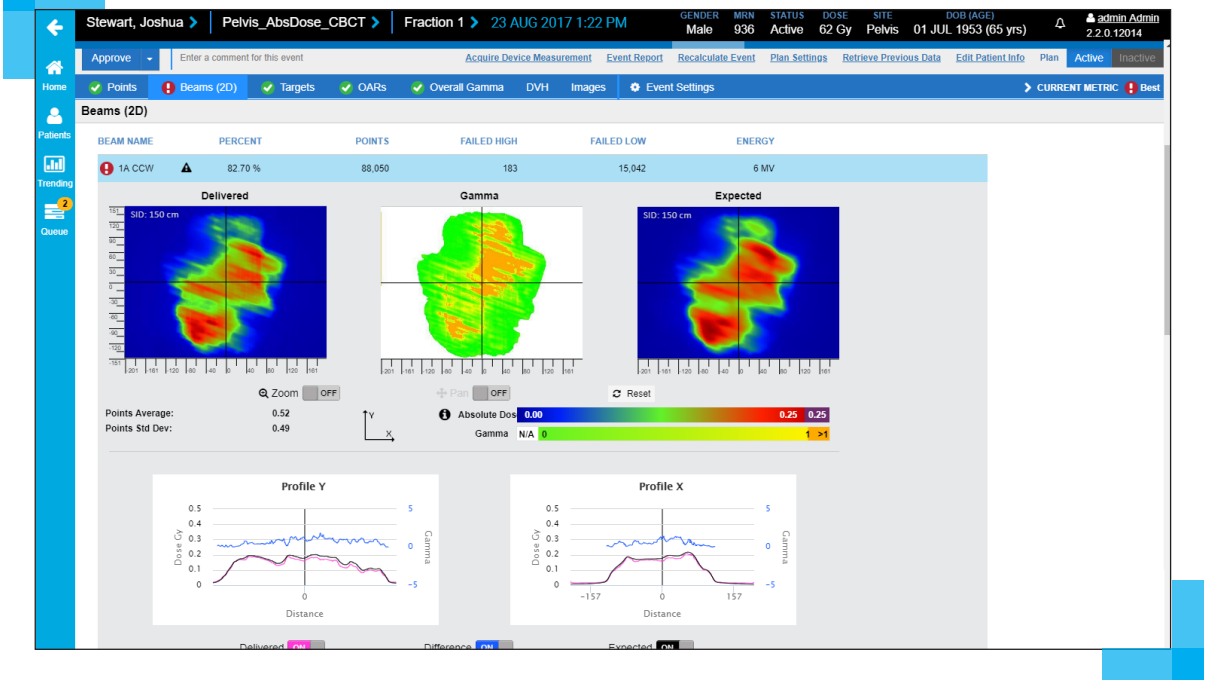
SEE MORE **FEATURES** ON
PAGES 12-13

## **FEATURE IN FOCUS:**
## PlanCHECK™ MODULE




Validate the treatment plan against departmental requirements, and automatically assess rules-based Physics Checks and comprehensive structure-based Dosimetric Checks.

## **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 clinics and machines with shared tolerances. Apply ready-to-use, but customizable tasks and 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™.
- 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*

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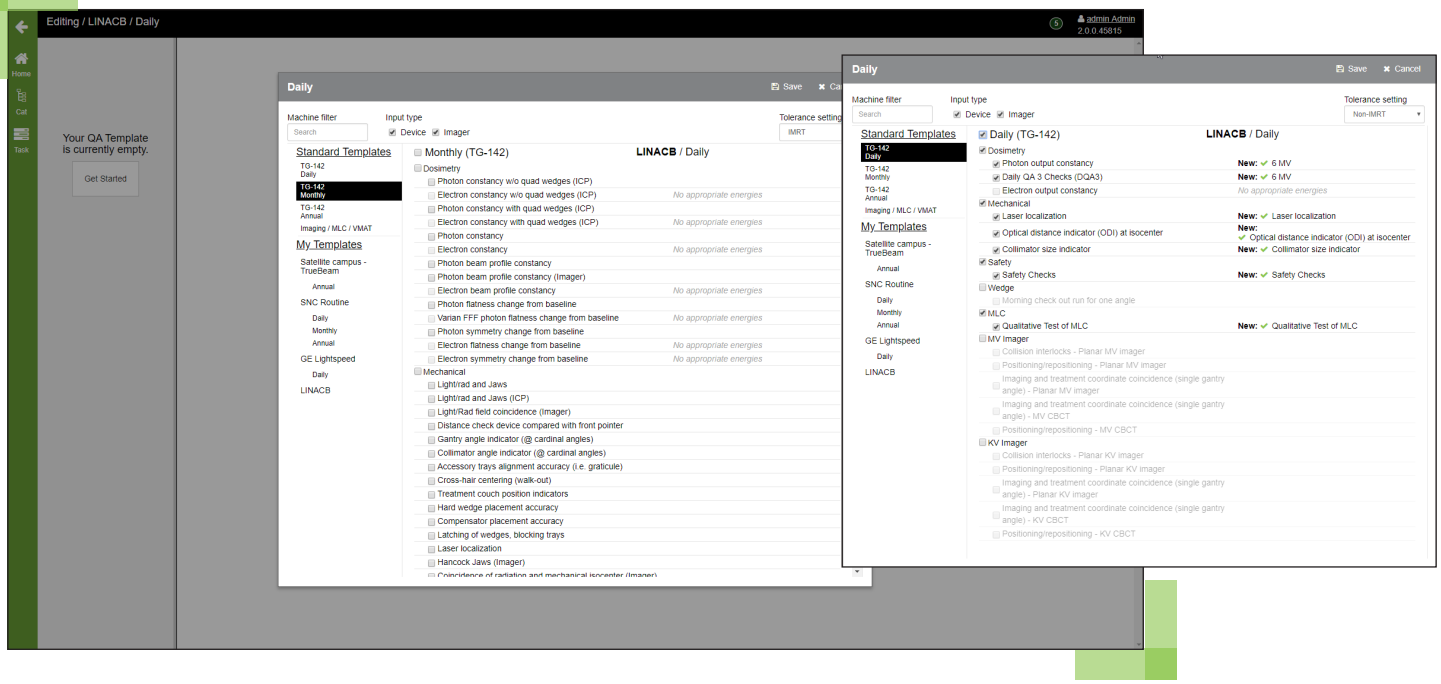
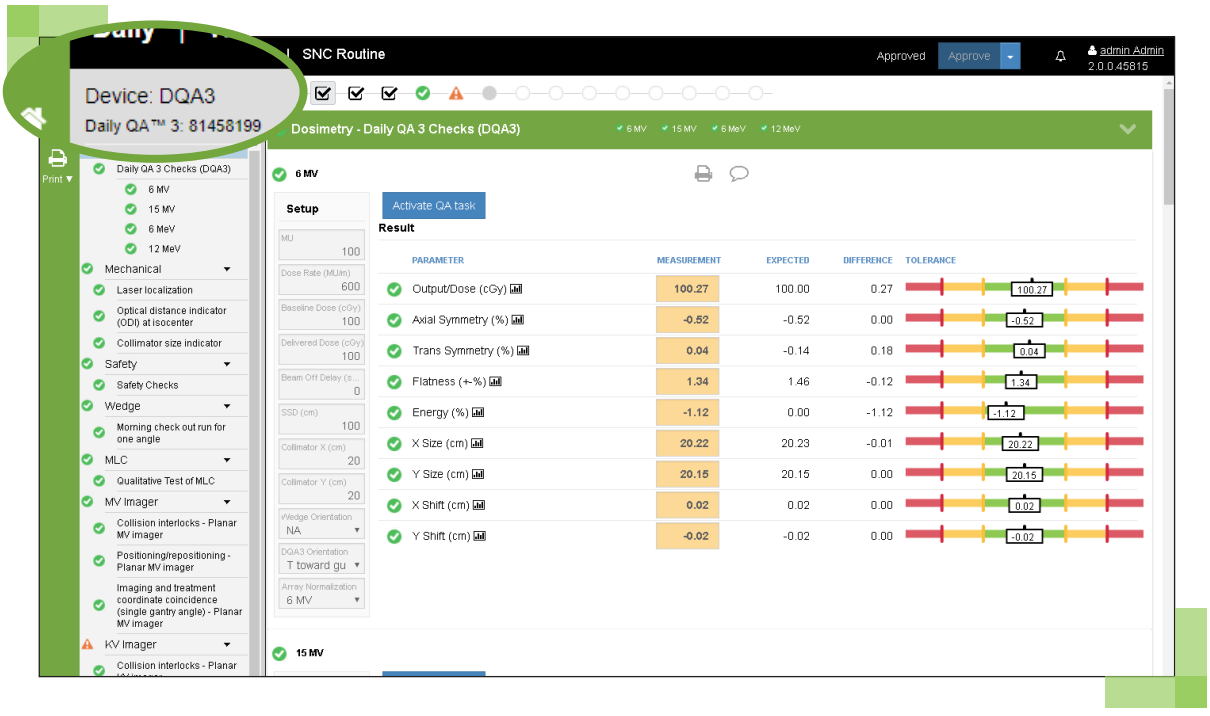
## FEATURE IN FOCUS:
# DEFAULT TEMPLATES




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 CONECTIVITY




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

## SunCHECK Platform

| Select Features | Practical Application |
|---|---|
| Action-oriented dashboard | • Overview of Patient and Machine QA actions<br>  - Results/review for patient data<br>  - Due, pending and approved Machine and Patient QA tasks<br>• Easy approval mechanisms, right from the dashboard |
| Common navigation mechanisms between Patient and Machine workflows | • Consistent user experience across the platform |

## SunCHECK Patient

| Select Features | Practical Application |
|---|---|
| PlanCHECK Module<br>• Physics Checks<br>• Dosimetric Checks | • Automated workflows for treatment plan validation and rules-based checks<br>• Easy identification of deviations with user-defineable pass/fail results<br>• Automated, comprehensive structure-based checks, including dose/volume metrics compared to user-definable constraints<br>• Complete patient QA record in a single platform |
| ArcCHECK direct device integration | • Array based Pre-Treatment QA support, complementing phantomless offerings -- and providing optimal, unmatched flexibility for Patient QA<br>• Efficient audit QA<br>• Improved root cause analysis |
| Independent Patient QA for Varian Medical Systems® Halcyon™ System | • First commercially-available solution for secondary dose calculations<br>• Log file-based Pre-Treatment QA<br>• Log file-based In-Vivo Monitoring |
| Transit Dosimetry<br>• 2D absolute dose for Fraction N<br>• Streamlined calibration process | • Fully independent absolute dosimetric QA of patient treatments, using only calibrated EPID data<br>• Ability to verify setup and first fraction against plan (74% of errors occur in first fraction – Bojechko et al, Med Phys)<br>• Patient position, movement and anatomy inherently included in analysis<br>• Makes true dosimetric In-Vivo Monitoring clinically feasible<br>• For European Union, supports required compliance with 2013/59/EURATOM – Article 83 |
| Universal Metrics<br>• “Plug and Play” metrics - no customization needed<br>• Use for each phase of Patient QA<br>• May apply >1 metric set to QA simultaneously | • Simple, more automated assessment of all Patient QA results<br>• Works relative to approved treatment plan, eliminating the need for adjustment or customization for each patient<br>• 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<br>• Target and OAR gamma dose metrics display in a single view<br>• Across all phases of Patient QA | • View Points, Beams, Targets, OARs, Overall Gamma, DVH, and Images in a single navigable view<br>• Auto identification of Targets and OARs |
| 3D secondary dose calculations for conventional linacs, Varian ICVI and BrainLab Stereotactic Cone Systems, Varian Medical Systems® Halcyon™ System and Monte-Carlo based TomoTherapy® and Radixact® support | • Complete 3D secondary dose calculations for Varian Medical Systems® Halcyon™ System and TomoTherapy in the same system used for conventional linacs<br>- Eliminate need for standalone solution |
| 3D TG-43-compliant HDR Brachytherapy secondary dose calculation support | • Complete 3D secondary dose calculations for HDR brachytherapy in the same platform used for conventional linacs, bore-based, and TomoTherapy systems |

## SunCHECK Machine

| Select Features | Practical Application |
|---|---|
| Comprehensive Daily, Monthly and Annual QA<br>• Standard and complete TG-142 and DIN templates for Daily, Monthly, Annual QA<br>• User-friendly editing or creation of customized QA templates/tasks<br>• Share QA templates across machines and centers<br>• Automated imaging, MLC, and VMAT QA task integration | • Get up and running quickly with complete and detailed templates<br>• No need for spreadsheets!<br>• Reduce QA delays, contributing to increased Patient Safety<br>• Set QA to standards, or customize to your own specific requirements<br>• Ensure consistency across your enterprise |
| Daily QA 3 and IC PROFILER direct device integration | • Perform beam measurements for certain Daily, Monthly and Annual QA tasks with a quick one-step process<br>• Operate and save results in real-time--no uploads or file transfers<br>• Custom measurements supported with advanced mathematical formulae |
| Fully TG-142/MPPG8 compliant | • Demonstrate compliance for accreditation purposes |
| Flexible data trending | • See if a given parameter is moving towards an out-of-tolerance condition<br>• Opportunity for pro-active machine management |
| Centralized data storage and flexible reporting | • Easy report retrieval for accreditation/compliance audits<br>• Meet documentation needs<br>• Embed images and files directly to QA tasks, standardizing data collection |

Visit **sunnuclear.com/suncheck**
to request your demonstration.

# Supporting Publications

Explore the evidence. 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 verficiation method for single-isocenter mutliple-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/resources**
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 900+ Clinical Sites Worldwide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Patient Safety Starts Here