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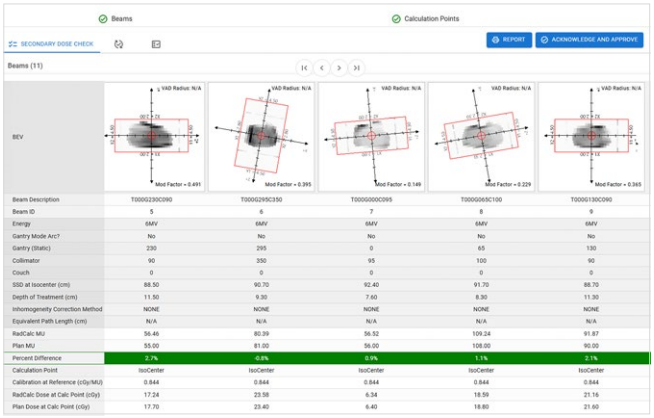
RadCalc Essential

RadCalc’s Essential Secondary Dose Check (SDC) for point dose calculations

The RadCalc Essential package performs independent Monitor Unit (MU) or point dose verification calculations for conventional 2D and 3D treatment plans, including electron, photon, MLC, 3D off axis, diode, and wedge support. It allows radiation oncology professionals to quickly and accurately verify treatment doses, improving patient safety and reducing the chance of errors. The package can be expanded with additional functionalities with a range of add-on modules, enabling further customization to meet the needs of various clinical workflows.



Features

- **Comprehensive treatment plan support**

  Handles a wide range of photon and electron treatment plans, including standard machines, CyberKnife®, Halcyon®, and MR-linacs, with fast and accurate point dose calculations.

- **Advanced dosimetric calculations**

  Utilizes Clarkson calculations with ray tracing for conventional radiotherapy and Modified Clarkson Integration (MCI) for modulated treatment plans.

- **IMRT/VMAT precision**

  Independent interpolation of control points ensures precise MLC pattern and fluence map verification, delivering accuracy within ±3 % [1].

- **Seamless data transfer**

  Import and export features enable efficient data transfer to and from TPS and Record and Verify (R&V) systems, reducing manual data entry and minimizing errors.

- **Streamlined plan comparison and validation**

  The Plan Comparison Tool simplifies treatment plan validation eliminating unintentional changes or data transfer errors by allowing clinicians to compare the intended plan from the TPS to the plan in the R&V.

- **Automation with RadCalcAIR**

  RadCalcAIR enhances workflow efficiency by automating key tasks, immediately alerting to plans that fail to pass clinical criteria. Analysis reports are automatically attached to your verified plan and sent to your workstation via email or to a directory of your choice on your server.

Portal workflows

SDC Only Workflow: Users evaluate the results of the SDC performed via RadCalcAIR and reviewed within the RadCalc Portal.

[1] RadCalc Classic: The Original Comprehensive Secondary Dose Calculation Software for Radiation Therapy

Simply Precise

Components

Included modules

- **RadCalc base**
  The core module of RadCalc performs all calculation verifications, ensuring accurate Secondary Dose Checks for radiation therapy treatments. This module enable the use of TeleTherapy devices such as Cobalt, C-arm linacs, CyberKnife®, MR-Linacs and Halcyon®.
- **Treatment plan (RTP) import**
  This module allows for the seamless import of treatment plans directly from the primary treatment planning system, eliminating the need for manual data entry and reducing the potential for errors.
- **Verify and record export**
  RadCalc can export the verified radiation treatment plan to the Record and Verify (R&V) system, streamlining the workflow and ensuring consistency in treatment documentation.
- **IMRT module**
  This module verifies calculations for Intensity-Modulated Radiation Therapy (IMRT) treatments, ensuring precision in complex dose distributions and enhancing the accuracy of treatment delivery.
- **Regions of interest for 3D geometry**
  By importing regions of interest from the planning system via DICOM RT or Pinnacle, this module computes depths and effective depths to points of calculation, enhancing dose accuracy and ensuring precise treatment delivery.
- **Superficial module**
  RadCalc allows the definition of multiple energies with individual HVL values and energy specific parameters. Every energy can have a list of allowed SSDs, cones and measured backscatter factors.

Optional modules

- **Electron Monte Carlo (eMC)**
  3D fast electron Monte Carlo Module – RadCalc, using EGSnrc/BEAMnrc, precomputes particle track tables, used to perform a 3D dose calculation for electron treatment plans with Monte Carlo methods. The computed dose volume is received back and 3D analysis tools are used to compare against the treatment planning system.
- **Brachytherapy module**
  RadCalc performs independent dose verification calculations for brachytherapy treatments, supporting HDR, LDR, and permanent implants. It includes tools for 3D dose and Dose Volume Histogram (DVH) analysis, providing comprehensive verification.
- **TomoTherapy® module**
  RadCalc supports TomoHelical, TomoDirect™ and TomoEDGE™ and verifies the treatment time and dose to multiple calculation points.
- **Gamma Knife® module**
  RadCalc performs point dose verification calculations for various Gamma Knife® versions and the Leksell GammaPlan® (LGP) planning system.
- **3D fast Monte Carlo photon Module**
  RadCalc, using EGSnrc/BEAMnrc, precomputes particle track tables, used to perform a 3D dose calculation for photon treatment plans with Monte Carlo methods. The computed dose volume is received back and 3D analysis tools are used to compare against the treatment planning system.

Requirements

General hardware requirements for RadCalc (main program)

	Network install	Local install – not recommended
Operating System	Microsoft® Windows® Server 2016, 2019 or 2022	Microsoft® Windows® 10, and 11, 32-bit and 64-bit operating systems
Processor	8 Core or better	8 Core or better
RAM	16 GB or more	
Network	5 Gbps connection, bandwidth to the client should be 10 mbps with a latency not exceeding 50 ms	
Video	Minimum resolution 1024 × 768 px (scaling up to 125 %) and minimum 1 GB video memory (RAM)	
Graphics	OpenGL 1.1 support required	OpenGL 1.1 support required
Hard drive space	1TB SSD available, varies with quantity and type of patient data	512 GB available, varies with quantity and type of patient data

Dedicated RadCalc external calculation engine hardware

	Fast Monte Carlo (Photon and Electron) Dose Engine
Operating System	Windows 64-Bit OS (10,11, Server 2016, 2019 or 2022)
GPU	NVIDIA GeForce RTX 3080 Ti, or similar (must be NVIDIA with 12 GB or more)
CPU	Intel Core i7-9700, 8 Core, 12 MB cache, or better
RAM	32 GB or more
Disk	512 GB SSD or more

Contact us!

LifeLine Software, Inc.
102 N College Ave Ste 1014
75702-7287 Tyler, TX
United States of America
P +1 903 207 4298
E sales.radcalc@lap-laser.com

www.radcalc.com