

ClearCalc

INDEPENDENT CALCULATION SOFTWARE



Intelligent Automation in Radiation Oncology

RAD formation

Intelligent secondary plan validation.

ClearCalc is a secondary calculation software that independently verifies the accuracy of your treatment plan dose calculation. With support for photons, electrons, and brachytherapy, results are quickly calculated and displayed on a user-friendly interface.

ClearCalc can be accessed as a Varian Eclipse Treatment Planning System (TPS) scripting plugin via ClearCheck or as a Windows executable application, allowing full access for all users.

For clinicians. By clinicians.

ClearCalc was developed by physicists as an independent secondary monitor unit (MU) calculation to instantly verify treatment plan accuracy. With seamless ClearCheck integration, users obtain results without launching separate software or performing DICOM exports. Results can be automatically appended to the ClearCheck final plan report, making documentation needs effortless.

Have confidence in your calculations and automate your plan evaluation workflow.

ClearCalc

Rest assured knowing your plan calculations are accurate.



Multi-Modality
Compatibility



Eclipse
Integration



Tissue Heterogeneity
Correction



Automated Calculation
Point Selector



Intuitive User
Interface



Direct ClearCheck
Reporting

Direct Eclipse Integration via ClearCheck

With the option for direct integration with Eclipse and ClearCheck, ClearCalc takes automating plan evaluation one step further by providing instant processing of secondary plan calculations and eliminating the hassle of importing or exporting DICOM plans. ClearCalc results can be automatically added to the ClearCheck report for the final plan printout with a single click.

For users without Eclipse, there is a standalone option that accepts DICOM plan files from multiple treatment planning systems.

ClearCalc Secondary Calculation

Test, Patient (999999999a)	Course: C1
Birthdate: 11/22/2019	Plan: ProstateNit
Sex: Male	Dose: 180cGy × 25 = 4500cGy
Hospital: Radformation	Prescribed Percentage 100%
Eclipse Version: 15.5.11	100.00% covers 96.00% of Target Volume (Value: 106.175%)
	Status: PlanningApproved

Photon Properties

TPS Machine: Eclipse CAP	ClearCalc Machine: Eclipse CAP
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MU Results

Field ID	Calculation Point	TPS MU	ClearCalc MU	Difference	Pass/Fail	Comment
Field 6	Isocenter 1	80.1MU	80.8MU	0.87%	✓	
Field 5	Isocenter 1	69.7MU	71.0MU	1.87%	✓	
Field 4	Isocenter 1	72.5MU	74.1MU	2.21%	✓	
Field 3	Isocenter 1	77.2MU	77.9MU	0.91%	✓	
Field 2	Isocenter 1	77.2MU	75.4MU	-2.33%	✓	
Field 1	Isocenter 1	72.5MU	72.7MU	0.28%	✓	
Field 7	Isocenter 1	78.2MU	76.2MU	-2.56%	✓	

Calculation Point Doses

Calculation Point	TPS Dose	ClearCalc Dose	Difference	Pass/Fail	Comment
Isocenter 1 -0.04cm, -0.10cm, 18.41cm	185.4cGy	185.2cGy	-0.11%	✓	

Custom Point Selection

Plan Points
Toggle display of points from plan
 Isocenter 1

Display Options
Scroll using mouse wheel.
Zoom using Ctrl + Mouse wheel.
Pan using Ctrl + Left mouse click/hold.
 Show dose wash
 Show central-axis field lines

ClearCalc Points Legend
ClearCalc recommended calculation points, color-coded

- Good agreement for all fields
- Good agreement for some fields
- Agreement not adequate for all fields

Field MU Results
Use the per-field Locate button to view or edit assigned calculation point.
With the Locate button active, click the point in the CT viewer to assign a new field calculation point.

Field ID	Calculation Point	TPS MU	ClearCalc MU	Difference	Pass/Fail
Field 1	Isocenter 1 <input checked="" type="checkbox"/>	73.1MU	72.4MU	-0.96%	✓
Field 2	Isocenter 1 <input checked="" type="checkbox"/>	76.9MU	74.2MU	-3.51%	✓
Field 3	Isocenter 1 <input checked="" type="checkbox"/>	77.9MU	78.5MU	0.77%	✓
Field 4	Isocenter 1 <input checked="" type="checkbox"/>	73.1MU	74.5MU	1.92%	✓
Field 5	Isocenter 1 <input checked="" type="checkbox"/>	70.2MU	71.3MU	1.57%	✓
Field 6	Isocenter 1 <input checked="" type="checkbox"/>	78.8MU	78.4MU	-0.51%	✓
Field 7	Isocenter 1 <input checked="" type="checkbox"/>	78.8MU	76.2MU	-3.30%	✓

Select Calculation Point for All Fields

Calculation Point Doses
Select a row to view the calculation point location.

Calculation Point	Location [x, y, z]	TPS Dose	ClearCalc Dose	Difference	Pass/Fail
Isocenter 1	-0.04cm, -0.10cm, 18.41cm	185.4cGy	186.6cGy	0.64%	✓

With ClearCalc’s custom point selection tool, an optimal calculation point is chosen automatically, avoiding heterogeneities and dose gradients. Alternatively, with a number of points generated and viewable on the patient’s CT within ClearCalc, selecting a point that makes the most sense for your department is simple.

One Platform for all Your Second Check Needs

Photon Calculation Module

The screenshot displays the Photon Calculation Module interface. On the left, a sidebar shows the course 'C1', plan 'TestPlan', and dose '180cGy x 45 = 8100cGy'. The main area is divided into three sections:

- Photon Properties:** Shows 'TPS Machine' as 'ClearCalc Machine' and 'Eclipse CAP' selected in a dropdown menu.
- MU Results:** A table with columns: Field ID, Calculation Point, TPS MU, ClearCalc MU, Difference, Pass/Fail, Verify, and Comment. Two rows are shown, both with 'Pass/Fail' status '✓'.
- Calculation Point Doses:** A table with columns: Calculation Point, Location [x, y, z], TPS Dose, ClearCalc Dose, Difference, Pass/Fail, Verify, and Comment. One row is shown with 'Pass/Fail' status '✓'. A 'View/Edit Calculation Points' button is located below this table.
- Calculation Parameters:** A table with columns: Field ID, Field 1, and Field 2. It lists various parameters such as Energy (6X), Gantry/Collimator/Table (179.0/0.0/0.0), Dose Calculation Point (Isocenter 1), Dose (85cGy and 96.4cGy), X1 [cm] (-3.3 and -3.2), X2 [cm] (+3.3 and +2.9), Y1 [cm] (-3.2 and -3.3), Y2 [cm] (+2.9 and +3.3), MLC Model (Millennium 120), MLC Plan Type (VMAT), Wedge (-), and Applicator (-).

ClearCalc supports a full complement of clinical techniques, including 3DCRT, IMRT, VMAT, SBRT, SRS, and virtual/ dynamic wedges.

The custom finite-sized pencil beam (FSPB) algorithm ensures that calculations are fast and accurate, fully accounting for tissue inhomogeneities.

One Platform for all Your Second Check Needs

Electron Calculation Module

The screenshot displays the Electron Calculation Module interface. On the left, a sidebar shows the course 'C2', plan 'Test Plan', and dose calculation '200cGy x 5 = 1000cGy'. The main area is divided into three sections:

- Electron Properties:** Includes 'TPS Machine' (EclipseCAP_TB), 'ClearCalc Machine' (Electron Test), and 'Dose Calculation Method' (Prescribed %).
- MU Results:** A table showing the results for Field 1.
- Calculation Parameters:** A table listing various parameters for Field 1, including Energy, Gantry/Collimator/Table, Dose, and Total Output Factor.

Field ID	TPS MU	ClearCalc MU	Difference	Pass/Fail	Verify	Comment
Field 1	201.2MU	201.5MU	0.13%	✓		

Field ID	Field 1
Energy	12E
Gantry/Collimator/Table	0.0/0.0/0.0
Dose [cGy]	200
Dose at Reference Condition [cGy/MU]	1.000
Depth Dose %	99.00
Equivalent Depth [cm]	3.237
Applicator Size [cm x cm]	10x10
Cone Factor	1.000
Cutout Factor Method	Sector Integration
Source to Skin Distance [cm]	100
Bolus	-
Total Output Factor	1.003

Electron plan evaluation is made simple using ClearCalc. Compute field doses to a prescribed percentage or choose a reference point, with the option to enter measured cutout factors or use automated sector integration. Calculations are based on AAPM TG-71 formalism.

One Platform for all Your Second Check Needs

Brachytherapy Module

Course: Brachy
Plan: Brachy Plan
Dose: 500cGy × 3 = 1500cGy

Radioactive Source Model
 TPS Source: VS Ir-192 (5mm)
 ClearCalc Source: Varian Ir-192 HDR VS2000

Source Property	TPS	ClearCalc
Air kerma strength [U]	18803.030	18803.030
Activity [Ci]	4665.764	4665.764
Dose rate constant [cGy/hU]	1.101	1.101
Active length [cm]	0.500	0.500

Calculation Point Doses

Calculation Point	Location	TPS Dose	ClearCalc Dose	Difference	Pass/Fail	Verify	Comment
Plan Point	0.60cm, 0.06cm, 18.41cm	1504.4cGy	1525.7cGy	1.42%			
Calc Point	-2.05cm, 0.07cm, 18.08cm	1500.6cGy	1424.1cGy	-5.01%	✗	<input type="checkbox"/>	

Treatment Plan Parameters

Channel 1			Channel 2			Channel 3		
Dwell Position	Dwell Time	Location	Dwell Position	Dwell Time	Location	Dwell Position	Dwell Time	Location
130.0cm	47.2s	-1.71cm, 0.02cm, 19.94cm	130.0cm	55.0s	1.60cm, 0.02cm, 19.94cm	130.0cm	51.3s	0.01cm, 0.02cm, 20.65cm
129.5cm	53.8s	-1.71cm, 0.02cm, 19.44cm	129.5cm	71.2s	1.58cm, 0.02cm, 19.44cm	129.5cm	64.4s	-0.01cm, 0.02cm, 20.15cm
129.0cm	56.9s	-1.70cm, 0.02cm, 18.94cm	129.0cm	83.1s	1.58cm, 0.02cm, 18.94cm	129.0cm	69.1s	-0.02cm, 0.02cm, 19.65cm
128.5cm	61.4s	-1.69cm, 0.02cm, 18.44cm	128.5cm	79.5s	1.59cm, 0.02cm, 18.44cm	128.5cm	84.5s	-0.02cm, 0.02cm, 19.15cm
128.0cm	56.4s	-1.68cm, 0.02cm, 17.94cm	128.0cm	66.2s	1.60cm, 0.02cm, 17.94cm	128.0cm	85.4s	-0.01cm, 0.02cm, 18.65cm
127.5cm	49.3s	-1.67cm, 0.02cm, 17.44cm	127.5cm	62.4s	1.63cm, 0.02cm, 17.44cm	127.5cm	74.7s	-0.01cm, 0.02cm, 18.15cm
127.0cm	40.5s	-1.63cm, 0.02cm, 16.94cm	127.0cm	57.9s	1.64cm, 0.02cm, 16.94cm	127.0cm	54.6s	0.00cm, 0.02cm, 17.65cm
126.5cm	35.7s	-1.60cm, 0.02cm, 16.45cm				126.5cm	75.0s	0.02cm, 0.02cm, 17.15cm
						126.0cm	35.6s	0.04cm, 0.02cm, 16.65cm

ClearCalc uses calculation methods outlined in AAPM TG-43. Incoming reference points are calculated and results are easy to interpret. Applicators, dwell positions, and dwell times are displayed for verification.

ClearCalc is an automatic secondary plan calculation software that streamlines plan evaluation workflow.

- ✓ **Full integration with Eclipse and ClearCheck streamlines planning workflows**
- ✓ **Accepts DICOM imports from multiple TPS vendors for flexibility in mixed environments**
- ✓ **Automatic optimal calculation point selector saves time**
- ✓ **Supports 3D, IMRT, VMAT, SBRT, SRS, brachytherapy, electrons, and more in a single solution**

ClearCalc simplifies workflows and gives users confidence in their final treatment plans, saving departments time and streamlining plan evaluation.