

# EPIDose™

## The Absolute in EPID Dosimetry

Convert any EPID image to an absolute dose QA plane for analysis in the SNC Patient™ software

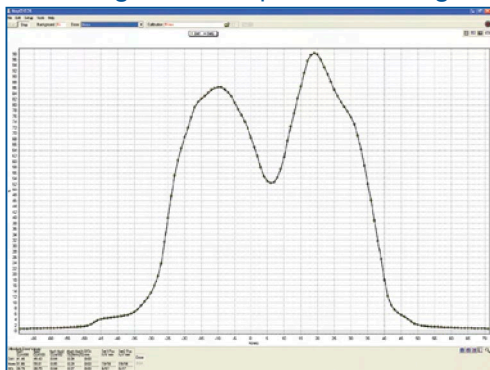
U.S. Patent No. 8,130,905

### Benefits

- > Quick conversion of MV EPID images to dose
- > Supports IMRT and rotational delivery QA
- > Independent of TPS and linac
  - Dose QA audits the TPS and linac
  - Catch errors image QA would miss
  - Tests output of TPS dose algorithms
  - Independent algorithms and software
  - No assumptions
- > Unparalleled accuracy
- > Use with 3DVH® - Powerful 3D and DVH analysis
- > Market leading SNC Patient™ software for complete analysis
- > Easy to use
  - No buildup on EPID
  - Combine split fields into one
  - Maximizes benefits of MV EPID
  - Supports any EPID distance and any dose plane setup (Depth/SSD)
- > Unique corrections applied to every measurement
  - Output factor variation (per segment)
  - Dose Distribution Kernel (phantom scatter)
  - Absolute dose commissioning (MapCHECK)

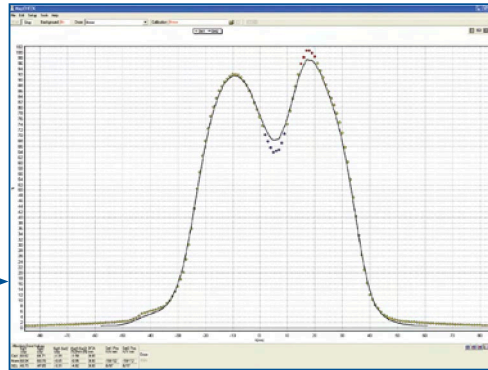
### Superior Image Based QA

EPID image vs. TPS "predicted" image >



EPID image (dotted) agrees with TPS predicted image (line). The TPS dose algorithm is not audited, the QA is not thorough.

EPIDose vs. TPS dose >



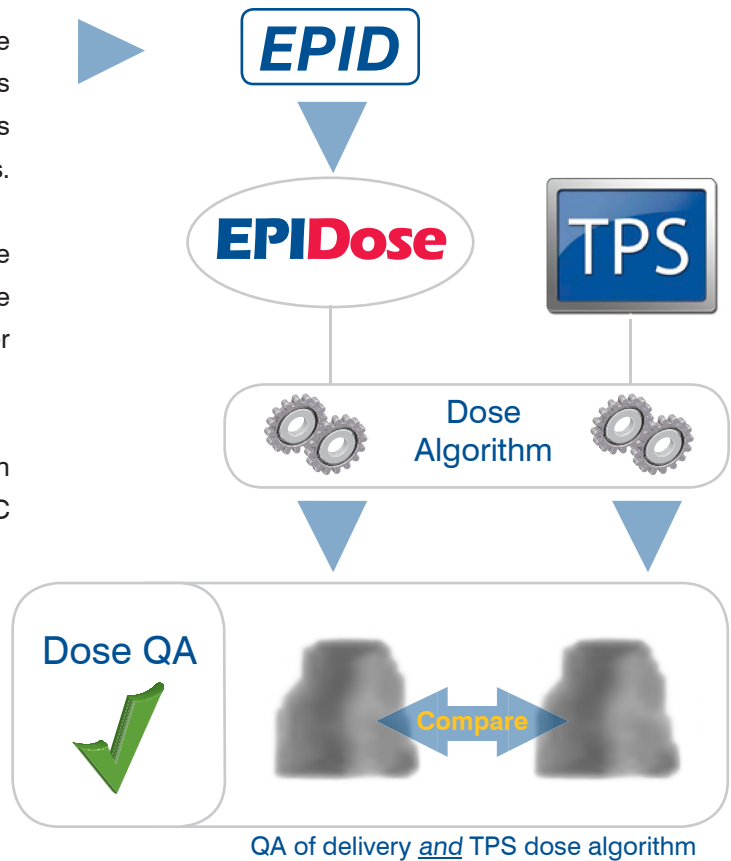
The same field with EPIDose algorithm and the TPS algorithm applied. A difference is clearly evident.



## The EPIDose Algorithm

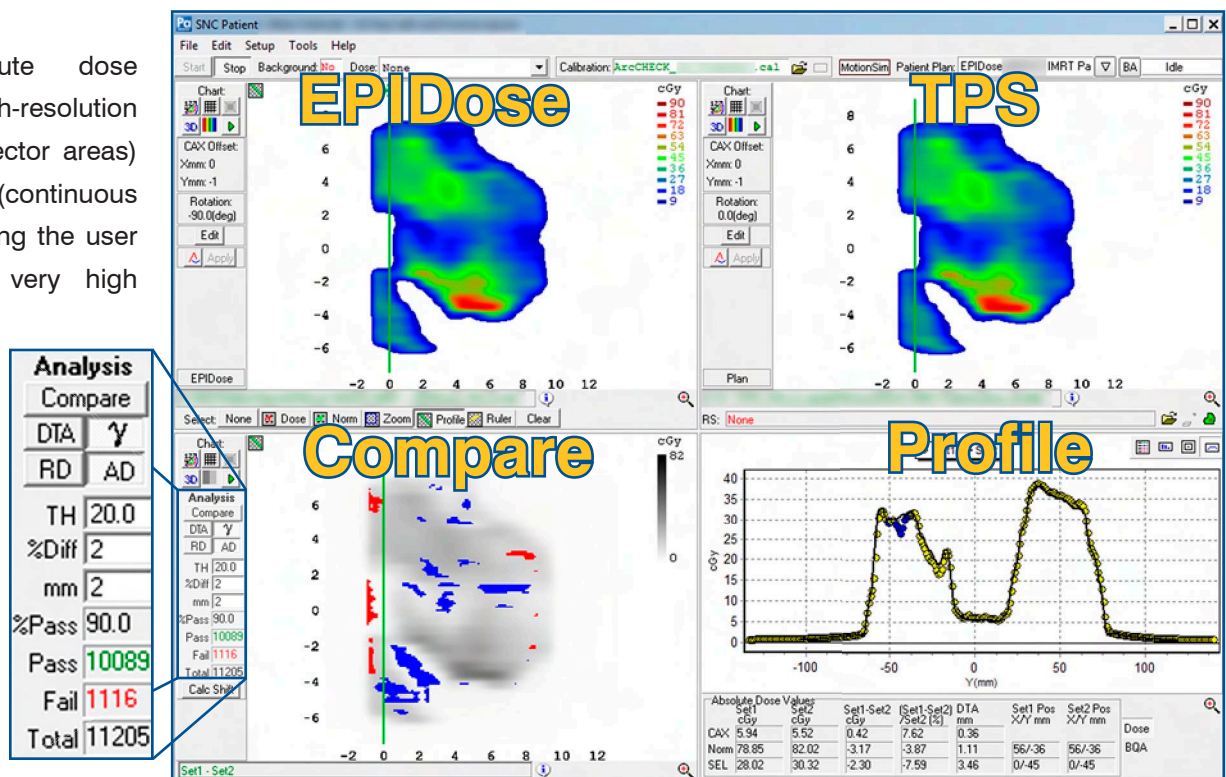
EPIDose works in seconds and converts any EPID image to dose in three steps:

- 1 The raw EPID image is projected to the desired dose plane location and corrected for output factor differences between EPID and dose. Each MLC sub-field (segment) is corrected for the source distribution of scattered photons.
- 2 The results of step 1 are convolved with a “Dose Redistribution Kernel” which converts the dose from EPID response (sharper than water) to a water equivalent scattering of dose.
- 3 Calibration of the EPID occurs with the calibration data that was stored in the model using SNC Patient Software.



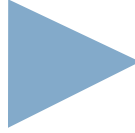
## EPIDose vs. TPS

EPIDose absolute dose analysis is high-resolution (small active detector areas) and high-density (continuous detectors), enabling the user to probe even very high gradient regions.

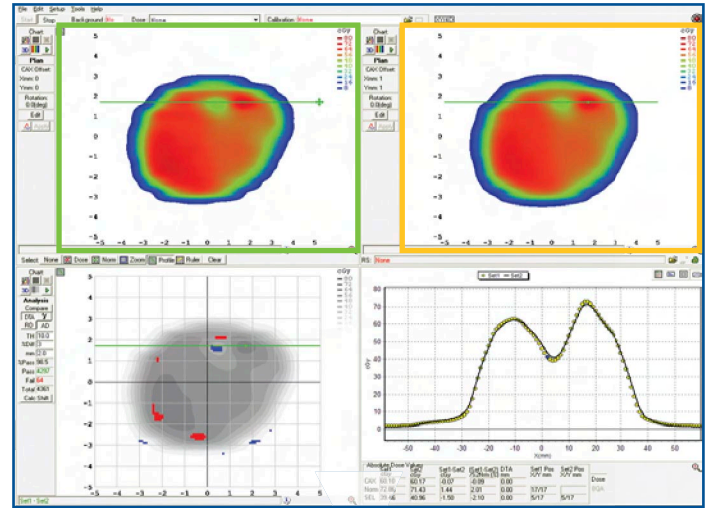


## Dose Model Improvement

EPIDose (upper left) vs. TPS (upper right). The TPS penumbra is very smooth caused by volume-averaged ion chamber profiles for beam model commissioning. The TPS is underestimating the profile gradients.



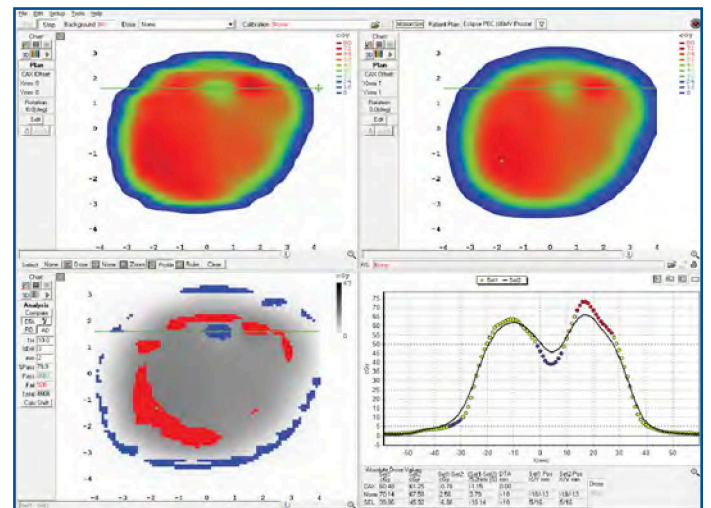
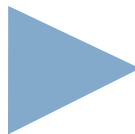
## Clinical Example



The same field, *after* an improved beam model was made in the TPS using a smaller detector. EPIDose revealed the volume averaging error in the commissioning data and confirmed the beam model improvement.

### Benefit

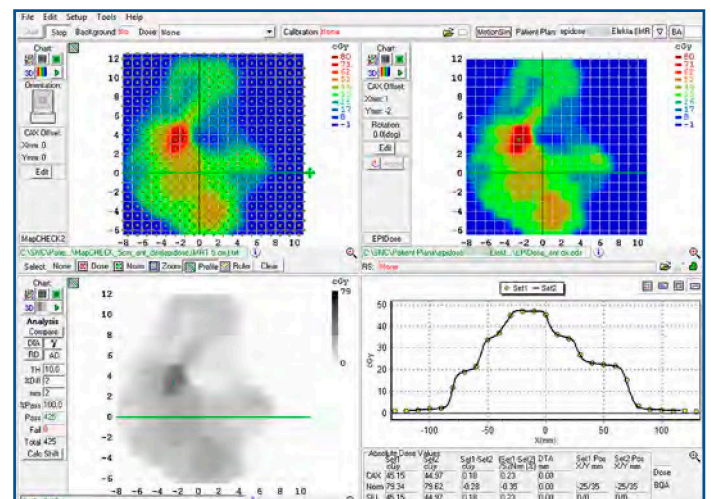
Effectively use the EPID imager you already have to perform dose based analysis within the SNC Patient Software!



## New: Batch Calculation for Elekta®

- > As easy as selecting a single Elekta log file
- > Example:
  - 7 Field IMRT Plan
  - SMLC segments per field ranging from 7 to 12

When used with Elekta, all EPIDose fields are batch calculated for comparison to the TPS



## DVH Analysis (3DVH™)

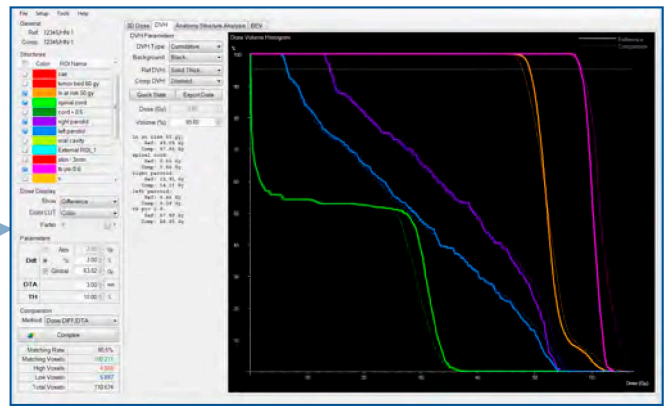
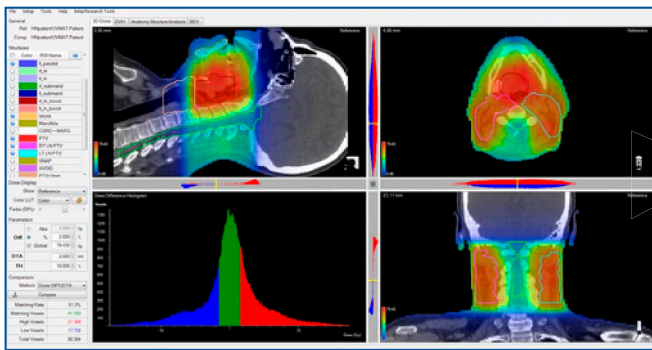
3DVH is a patented (U.S. Patent No. 7,945,022) method that enables the comparison of measured and planned DVH's without the complications of a secondary dose algorithm.

The planned DVH is extracted from the DICOM patient plan file, then compared to the EPIDose measured DVH result.

### 3DVH Patient Plan QA

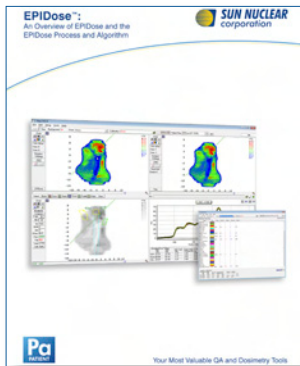
**1** Measured EPIDose dose differences perturb the original planned dose, allowing comparison of original planned and converted planned

**2** DICOM RT structures are presented for DVH analysis, giving a clinically significant analysis of the impact of measured dose differences



For more information on EPIDose, ask for:

“EPIDose: An Overview of EPIDose and the EPIDose Process and Algorithm”



Or visit [www.sunnuclear.com](http://www.sunnuclear.com)

## Specifications

Operating system: Windows 2000, XP, Vista, 7 (32 or 64 bit)

Computer Requirements: 2GB RAM, 1 available USB 2.0 port, Dual-core processor (2.4GHz or higher), 5GB hard disk space, 16MB VRAM video card, 16-bit color depth, OpenGL hardware accelerated