

**T-PPA-000-0110
TomoTherapy® Hi-Art® Version 4.0
Physicist Training: Course Outline – Madison Location**

Five (5) day Physics Training includes basic Hi-Art® System function and operational instruction. The training course is provided at TomoTherapy's Technology and Training Center in Madison, Wisconsin, USA.

Tuition fee covers one clinical staff member. Associated travel and living expenses are not included in tuition fee.

Day 1

- I. Phantom Treatment Demo**
- II. Manufacturing Facility Tour (Madison Training Center Only)**
- III. Introductory Presentations**
 - A. Course Overview
 - B. Differences between TomoTherapy® Units and Traditional Radiation Therapy Machines
 - C. Beam-Line Components Overview: Gantry, Target, Jaws, Multi-leaf Collimator, Imaging Detector
- IV. Hands-On Demonstration: Machine Warm-up**
 - A. System Start-up
 - B. Check Operating Temperature
 - C. Daily Warm-up Procedure
 - D. Air Scan Procedure
 - E. System Shut-down
 - F. Emergency Stops
- V. Machine Quality Assurance**
 - A. Hands-On Demonstration: Daily QA
 - B. Monthly QA Overview
 - C. Annual QA Overview (See Tuesday's "Installation and Verification" Section for Details.)
- VI. Hands-On Software Demo: Creating Procedures for Machine QA**
 - A. Example: Create a Longitudinal Profile
 - B. Example: Irradiate a TLD to 300 cGy Using a Static Beam
 - C. Example: Create a Step Profile for Film Calibration
 - D. Example: Expose a Film to a JPEG Image

Day 2

- I. Installation and Verification:** This section describes the initial physics verification and acceptance testing performed by a TomoTherapy, Inc. physicist, and is also relevant to the tests that a site physicist would perform as part of their annual QA.
 - A. Installation Overview**
 - B. Physics Verification Tests**
 - 1) Alignment and Stability**
 - a. Linac Alignment with MLC, Jaws, and Plane of Gantry Rotation
 - b. Hands-On Demo: Laser and Couch Alignment Overview
 - c. Secondary Alignment Tests of the MLC, Jaws, and Detector
 - d. Hands-On Software Practice: Using the Film Analyzer to Check Alignment Films
 - 2) Matching Beam Profiles and PDD's**
 - a. Twinning in the Factory
 - b. Water Tank Hands-On Practice
 - 3) TomoImage™ Verification**
 - 4) Monitor Unit Display Calibration**
 - C. Overview of System Maintenance (Field Service)**
- II. TomoTherapy® Quality Assurance™ (TQA™) Purchase Option:** How to use the on-board machine sensors (e.g., monitor chambers and detector array) to expedite, enhance, and track certain machine QA tasks.

Day 3

I. Physics of Helical Planning

A. Treatment Geometry Overview

B. User Inputs

- 1) Image Set and Contours
- 2) Treatment Geometry (Includes Effects of Pitch and How to Improve the Delivery Time)
- 3) Prescription and Constraints
- 4) Dose Calculation Grid

C. System Processes

- 1) Dose Calculation
- 2) Optimization
- 3) Fractionation

D. 3D Conformal Planning

II. IMRT Verification Hands-On Demonstration

III. Pre-Planning CT Requirements

IV. Treatment Planning on the Planning Station

A. Contouring, ROI's and Plan Settings tabs

B. Optimization Tab

- 1) Prescription, Constraints, & Optimization Choices
- 2) Isodose Editor & Dose Volume Histogram
- 3) Creating a Baseline DVH for a Specific Field Width
- 4) Adjusting for Treatment Time & Dose Characteristics; Estimating Rotation Period
- 5) Changes to Targets & Regions at Risk
- 6) Displaying & Selecting Isodose Curves

C. Fractionation Tab

- 1) End-of-Planning Buttons
- 2) Plan Acceptance & Printing the Plan

Day 4

I. Additional Hands-On Planning Practice

II. Patient-Specific Quality Assurance

A. Hands-On Practice Creating Delivery Quality Assurance (DQA) Plans on the Planning Station

- 1) Phantom Placement
- 2) Dose Calculation

B. Hands-On Practice Performing DQA on the Operator Station

- 1) TomoTherapy Commissioning Phantom Setup & Positioning
- 2) Film & Ion Chamber Placement
- 3) Scanning & Automatic/Manual Registration of the Phantom
- 4) Treating the Phantom with the DQA Plan

C. Hands-On Practice with DQA Analysis

- 1) Film Registration Methods
- 2) Dose Profiles, Isodose, Gamma, Point Dose Analysis

D. Hands-On Demonstration Using an Ion Chamber Array Device for DQA

III. Cluster Maintenance & Backup

IV. TomoTherapy Record & Verify

V. Image Value to Density Table Creation

VI. Film Calibration

Day 5

- I. Physics of TomoDirect™**
 - A. Introduction
 - B. Operator Station
 - C. Couch
 - D. Leaf Filters for Commissioning
 - E. Planning
 - F. QA
- II. TomoDirect™ Applications Training**
 - A. Hands-on Practice: Creating a Plan
 - B. Hands-on Demonstration: Delivering a Plan