Varian Particle Therapy

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ProBeam™
PSI – Paul Scherrer Institute

>1100
ProBeam™
Rinnecker Proton Therapy Center

>1,500
ProBeam™
Scripps Proton Therapy Center
ProBeam™
Key Features

Dynamic Peak™ Scanning

2nd Generation IMPT
Pencil Beam 4 mm $\sigma$
Dose Rate 2 Gy/L/Min
ProBeam™
Key Features

Dynamic Peak™
Scanning
Dynamic Peak™ Scanning
Precision

![Graph showing precision with energy (MeV) and sigma values]

- **Sigma-x**
- **Sigma-y**

4 mm

1 mm
Large Field Accuracy
Scripps Proton Therapy Center
ProBeam™
Key Features

Dynamic Peak™ Imaging

- On-board 2D & CBCT
- Dedicated User Interface
- I-Lab Development
- TrueBeam Roadmap
Dynamic Peak™ Imaging
Key Features
Dynamic Peak™ Imaging
Biplanar Imaging Panels

CBCT Capable
Robotic
Image Analysis
Integrated Hardware
Integrated Software
Dynamic Peak™ Imaging

Key Features
Dynamic Peak™ Imaging
Deformable Registration
ProBeam™
Key Features

Dynamic Peak™
Workflow

TrueBeam™ Console
Therapy Hand Pendant
Guided Workflow
Field Groups
Dynamic Peak™ Workflow
Common User Interface – Guided Workflow

Console

Pendant
Dynamic Peak™ Motion Management

- Lessons learned conventional RT
- Multiple Strategies
- Monitored Breath Hold, Motion Scanning, Gating, Tracking, Triggered Imaging
Intra-fraction Motion

No Motion
Amplitude under x mm

Motion
Amplitude over x mm

Deformation
Change of tumor geometry

Interplay Effect
Hot and cold spots
Also an issue for IMRT
Not present with scattering

Position Effect
Missing the target

Adaptive treatment
Re-plan, online or offline

Scanning Direction
Lei Dong: solves 90% of issues
Ready to publish

Repainting
Tony Lomax: 2 times layer
4D simulation

ITV Treatment
Larger margins around target
Dominant strategy in photons

Gating
Selecting part of the motion cycle

CBCT
Detect deformation

Def- registration

RPM
Vision RT
Calypso
Triggered Imaging
Auto Beam Hold

Dynamic Peak™ Motion Management
Overview
Varian Medical Systems
Vision

A world without fear of Cancer