



## Spirometry Based DIBH Breast Treatment

Scott W. Hadley PhD

The

Department of Radiation Oncology  
University of Michigan

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## SDX System Overview

- Voluntary breath hold spirometry system
- Patient hold their own breath using...
  - Audio coaching from therapists
  - Visual feedback from goggles



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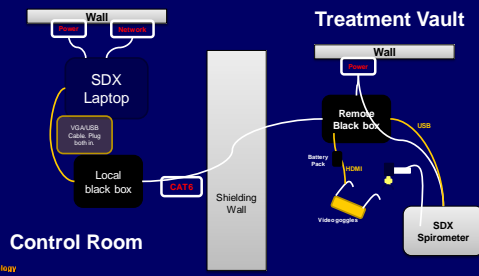
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## SDX Connections



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## HDMI Goggles to show patient laptop

HDMI Goggles



Visual Adjustment Wheels



### Patient Sees Mirrored Laptop



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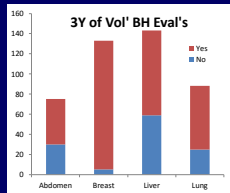
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## 3 Years of BH Evaluation ...

- 133 left sided breast cases evaluated
- Only 5 patients were ruled out at simulation
  - 3 false starts
  - Short BH length
  - Minimal CW separation



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## Spirometry Calibration

- 3 Litter syringe used for calibration
  - Performed once and stored in BD
  - Each unit has it's own calibration
- Occasionally test one syringe against another
  - Relative calibration more important that absolute
  - Biomed may provide cross calibration service



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## Laptop / App Configuration

- Use Networked drive for Database
  - Secure & HIPPA IT compliant
  - Backed up
  - Accessible my Multiple systems
- Colors chosen with color blind in mind
  - Blue and Yellow (not red/green)



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## RTT Training and Competencies

- Initial Training
  - Hands on training; one for sim' one for Tx
  - Using the system themselves
  - In clinic competency
- Annual Review
- Documented and signed off

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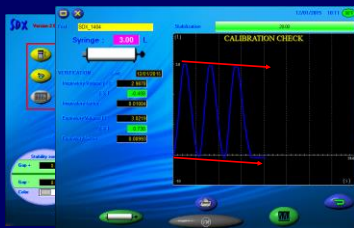
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## Daily Calibration Check



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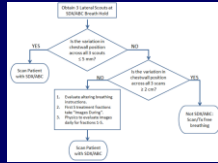
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## Simulation Scan List

- Free Breathing CT to determine need for DIBH
- Setup, train patient and sim' with DIBH
  - Three repeat lateral scout views to assess DIBH reproducibility
- Full CT scan with DIBH



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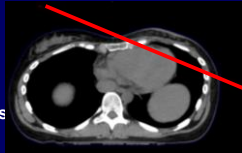
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## Simulation Free Breathing

- Single free breathing scan
  - Find where heart and chest wall come closest
  - Draw a line between CT catheters



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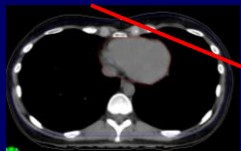
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## Simulation BH using Spirometry

- Single BH scan
  - Notice separation between chest wall and heart



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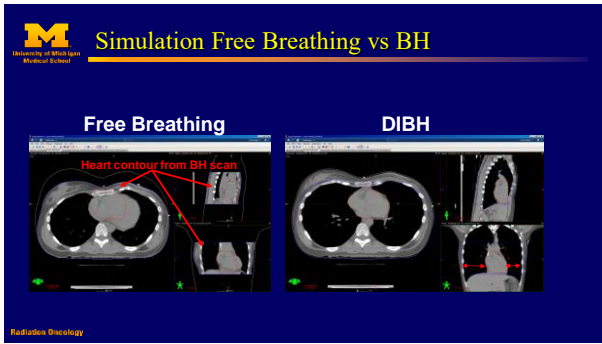
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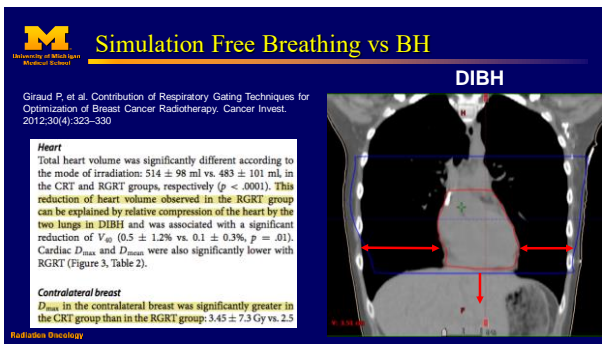
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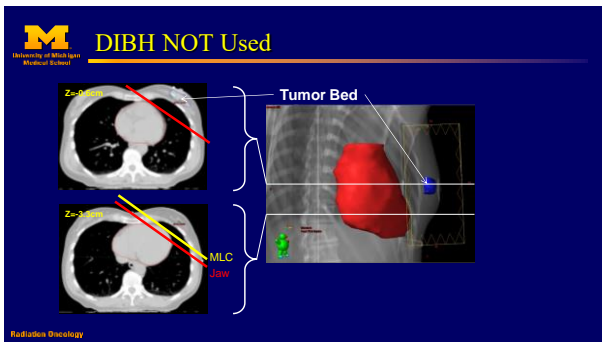
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## Simulation – Preparing Main Screen

Patient's Name  
Goggles Not Used  
at this Point

Represents 5 seconds

Lung  
Volume  
Test Info



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## Simulation – Lung Volumes

Lung  
Volume  
Tests



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## Gating Level – Inhale

- Treating *above* diaphragm
- Percentage button switches to 75%
- Gaps set at + 0.1 and - 0.1

Lung Volume  
Tests – Select  
the best of three



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## Simulation – Breath Hold Training

Inhale – 75%

± 0.1 L

Goggles are now positioned on patient



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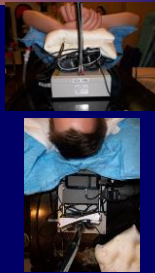
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## SDX Treatment Room Setup

### • Position SDX - Top of Table

- Position SDX in a manner that allows the cables least interaction with the vac bag/immobilization equipment
- SDX Flexion Tube: position superior to allow proper patient alignment
- Velcro SDX power cables along table



### • Vac bag is conformed to SDX

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## DIBH Treatment Start

- Review DIBH technique with patient
  - YouTube Video for Off Line Review!
  - <https://youtu.be/zMP79RXjhNg>
- DIBH for all setup and portal imaging
  - SDDs set/read at DIBH too



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## Breath Hold Instructions

### SDX "Beam On" Policy Standardize Instructions

- "When you are ready take in a deep breath and hold in the yellow band"

When the clock starts:

- "The beam/scan will be on for # of seconds" (estimate the beam time adding 2-3 seconds)
- Once this statement is heard the key is turned and the beam is turned on

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## Tx Setup Imaging

- MV Cine mode during treatment.
  - Replaced by three repeat BH ports
- Standard imaging policy
  - Image once a week unless issue is found
  - 2 field is one medial
  - Nodal case
    - Orthostat with s'clav' and medial

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## References

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