Lung SBRT at Provision Cares Proton Therapy Knoxville

Lung SBRT at PCPTK

- Patient CT simulation
  - 2mm slice thickness
- Treatment Planning
  - Typically 2-4 fields depending on motion and lesion
  - Robustness evaluation criteria
    - 5mm translation,
    - 3 degree rotations
    - 3.5% range uncertainty
    - Evaluating change in D95 less than 3% from nominal plan, as well as robust sparing for normal tissues

Lung SBRT at PCPTK

- Motion Management and IGRT
  - 4D simulation with IGRT alignment
  - We currently plan on the 3D static scan, incorporating the 4D scan for target delineation and density overrides
  - Layer repainting (can use volume repainting in select situations)
  - IGRT - X-Ray orthogs IGRT, with implanted fiducial if possible. Can be supplemented with surface imaging
    - Soon to be incorporating CBCT and breath hold
- What are the 3 most important technologies to improve lung treatment quality?
  - CBCT
  - Breath hold
  - 4D plan optimization

Lung SBRT at PCPTK

- Beam angles selected to improve robustness and limit exit dose into healthy lung tissue
- Repainting and minimum MU/spot determined from magnitude of motion