Cloud Manufacturing in Healthcare: A Gamma Knife Center Experience

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What is a Gamma Knife?
Gamma Knife Components

Patient Positioning System

Shielding doors

Shielding

$^{60}$Co sources

Collimator Body

~20 metric tons to protect you from 20 grams of $^{60}$Co
Model C – Helmet Collimation
Defining a Dose Distribution
How Onyx is Medically Used?

• a liquid embolic glue
  minimally invasive therapy for arteriovenous malformations (AVM) in the brain
Research Problem

- Effect of onyx in Gamma Knife treatment planning
Use of Phantom

• What is a phantom and how it is used?
Custom-build Phantom
Cloud Manufacturing

1-Placing orders over the internet
Cloud Manufacturing

2-Post processing - Calculation of support materials and printing time
Parts Manufacturing
Testing

• Onyx inside the phantom treated with Gamma Knife

• Control with radiochromic film
Future Works

• Phantom with embedded sensor design.
• New phantom designs for different neurological problems.
Thank you.
Questions?