Challenges selling both gamma and x-ray blood irradiators

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• Gamma Teletherapy Systems
  Equinox & Phoenix

• Blood Irradiators
  Gamma & X-ray

• Cyclotron Systems
  14, 25, 35, & 70 MeV
150 employees and 70+ worldwide agents
More than 1000 active cobalt teletherapy units installed worldwide
More than 1900 Gammacells® installed worldwide
More than 300 Raycells® installed worldwide, and
Cyclotrons - one, 70 MeV installed in Italy
Blood Irradiation

Purpose

- To prevent Transfusion-associated Graft-versus-host Disease (TA-GVHD)
- Patients that need irradiated blood:
  - Bone marrow transplant patients
  - Stem cell transplant patients
  - Congenital Immune Def. Syndrome
  - Hodgkin’s disease
  - Directed donations - blood relatives
  - Intrauterine transfusions
  - Acute leukemia patients
  - Non-Hodgkin’s lymphoma patients
  - Premature infants
  - Neuroblastoma, glioblastoma
• Mainly by dedicated caesium-137 or x-ray blood irradiators
• LINACS or Cobalt 60 teletherapy devices
• Alternative technologies (chemicals and UV light)
X-ray or Gamma?

So What Are the Differences?

• Gamma Irradiators:
  – 662 KeV
  – 30-year source half-life – no replacement needed
  – No water requirements/costs
  – Ideal for medium to high throughput
  – Downtime minimal
  – Minimal service costs
  – Room requirements
  – High regulations/personnel
  – Disposal costs are high

• X-ray Irradiators:
  – 160 KV (60-80 KeV avg.)
  – tube/power supplies eventually need replacing
  – Water requirements/costs
  – Ideal for low to medium throughput
  – Downtime moderate
  – Moderate service costs
  – No room requirements
  – Low regulations/personnel
  – Disposal costs are low
Raycell Mk1

Features

- Canister size 1.6 L
- Irradiates 3 red cell bags in 5 minutes for 25 Gy minimum
- No external water required
- Syringe holder
- Barcode reader
- Download cycle info to printer, or LIMS
- Ergonomic workstation
- Compact and lightweight
Raycell® Mk2

Features

– Optimal dose uniformity
– 2.0 or 3.5 L canister option
– Barcode scanning
– Easy to use -1 canister, 1 lid
– 2.0 L – 4 bags in 3 minutes
– 3.5 L – 6-8 bags in 5 minutes
– Low regulations/personnel
– Minimal budget for disposal
– Requires external water
Main Points:

– Long-lasting, dependable
– Optimal dose uniformity
– Multiple source configurations
– 1 red cell bag in 2, 3 or 7 mins.
– No moving source
– Ideal for small to medium throughput locations
– Barcode scanning
– Cycle validation
– Safe, Simple & User-Friendly
Main Points:

- Long-lasting, dependable
- Optimal dose uniformity
- Multiple source configurations
- 4 red cell bag in 3 or 5.5 mins.
- No moving source
- Ideal for medium to large throughput locations
- Barcode scanning
- Cycle validation
- Safe, Simple & User-Friendly
Challenges selling x-ray units

• Reliability not the same as a Gammacell
• Service costs higher
• Product life shorter – 10 years versus 20 + years
• Relatively new technology in blood irradiation market
Challenges selling gamma

• Overall market accepting gamma is shrinking
• Added security costs
• Future disposal costs need to be considered
• Government incentive programs pushing customers to x-ray
• More countries switching from gamma to x-ray
• More incentives (gov’t or other) to pay for disposal of gamma irradiators if new x-ray unit purchased
• Still a few countries that prefer gamma over x-ray
• Potential increase in chemical and UV light for platelets