

Challenges selling both gamma and x-ray blood irradiators

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- **Gamma Teletherapy Systems**

Equinox & Phoenix



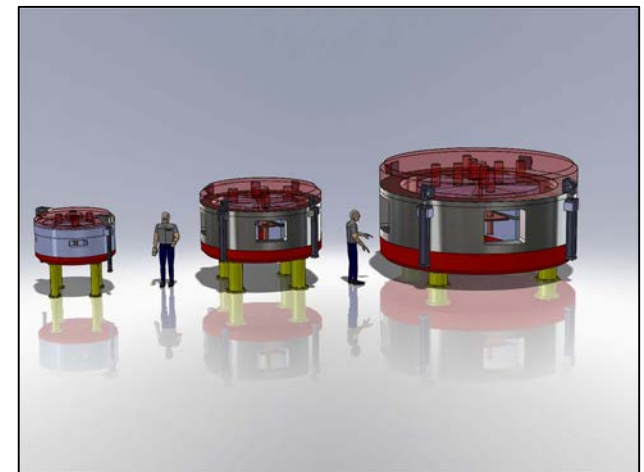
- **Blood Irradiators**

Gamma & X-ray



- **Cyclotron Systems**

14, 25, 35, & 70 MeV





Our Global Impact

- 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



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)



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



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





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





Features

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





Features

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



- 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

- 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