Future Supply of ^{99}Mo, ^{99m}Tc

Mark Frontera, GE Global Research Center

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Aaron Bernstein [b], Tomas Eriksson [d], Mathilde Figon [b], Karin Granath [d], Martin Orbe [d], Charlie Shanks [b], Erik Stromqvist [d], Julie Woodland [c], Peter Zavodszky [a], Uno Zetterberg [d]

[a] GE Global Research Center, Niskayuna, NY 12309 USA

[b] GE Healthcare Global Supply Chain, Arlington Heights, IL 60004 USA

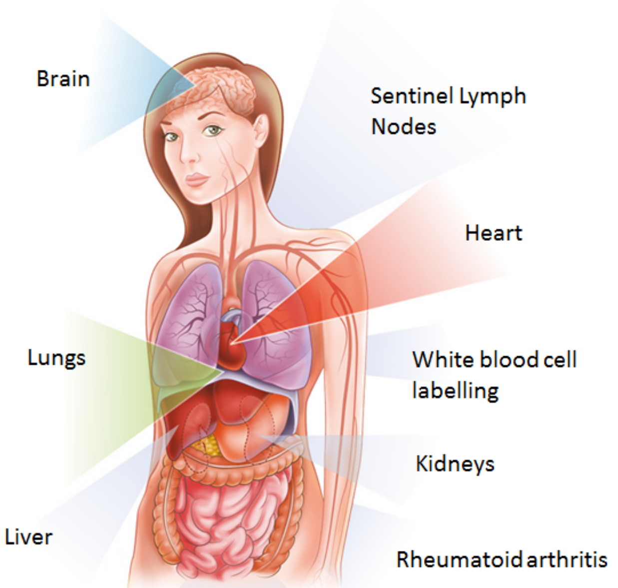
[C] GE Healthcare Life Sciences, Amersham, England UK

[D] GE Healthcare Cyclotrons, Uppsala, Sweden

Imagination at work.

8	**Development Toward Non-HEU Based Mo-99 Production, Session I** **Session Chair: Chris Bryan**	3:30 pm	Northwest Medical Isotopes, LLC Overview and Status	Carolyn Haass (Northwest Medical Isotopes, LLC)
			Current Engineering and Design Activities at LANL Supporting Commercial U.S. Production of Mo-99 Without the Use of HEU	Gregory Dale (LANL)
			NorthStar Progress Towards Domestic Mo-99 Production	Jim Harvey (NorthStar Medical Radioisotopes)
			Overview of Argonne Support for Mo-99 Medical Isotope Production: NorthStar Medical Technologies	Sergey Chemerisov (ANL)
			Powder Metallurgy Fabrication of Thin, Flat Molybdenum Disks	Richard Lowden (ORNL)
			Future Supply Options of Mo-99, Tc-99m	Mark Frontera (GE Global Research)
5:30 pm Poster Setup in Sphinx Grand Ballroom — Almas Temple 6:00 pm Poster Session and Reception Meeting Room: Sphinx Grand Ballroom				

GE Healthcare Nuclear Medicine Presence



^{99}Mo ^{99m}Technetium Generators
Cardiology, Neurology, Oncology
Other diseases

Life Sciences & Global Supply Chain



^{99m}Tc based Products on global market
^{99m}Tc Generators serving 38 Countries
31 United States Radio pharmacies

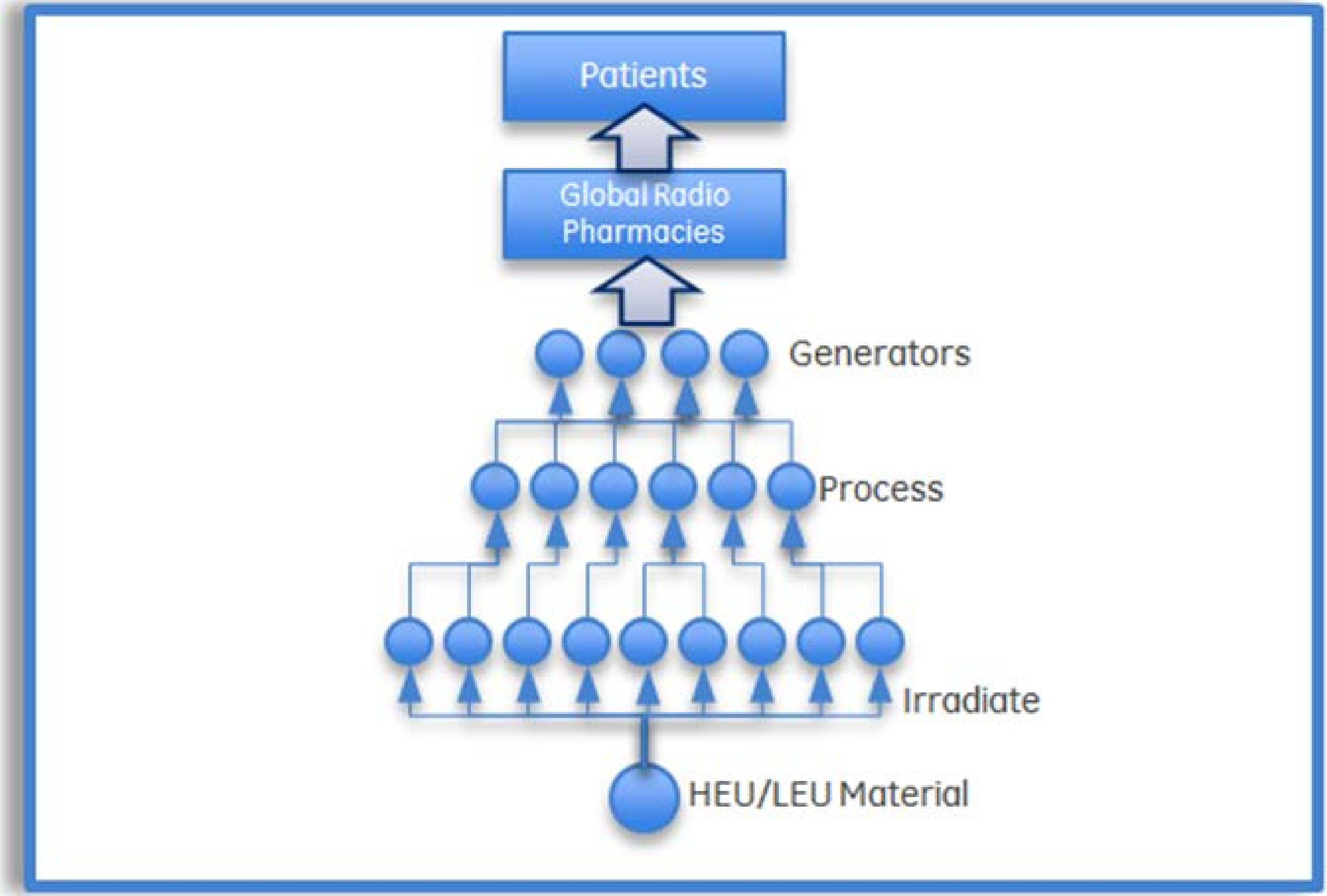
Nuclear Cameras

+5,500 Cameras sited
Multiple Product Offerings

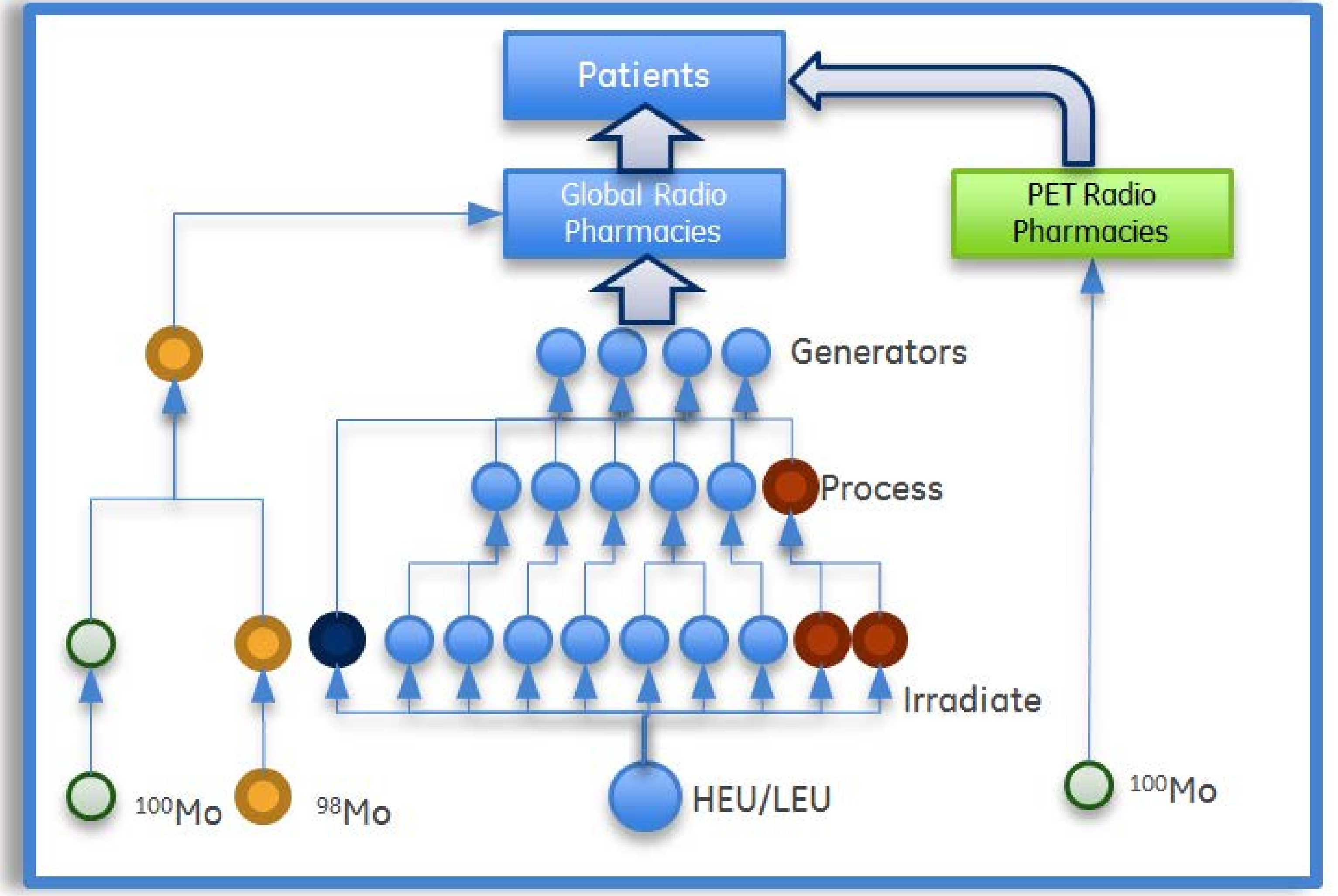
PET Cyclotrons

330 Cyclotrons sited
10 MeV, 16 MeV Platforms

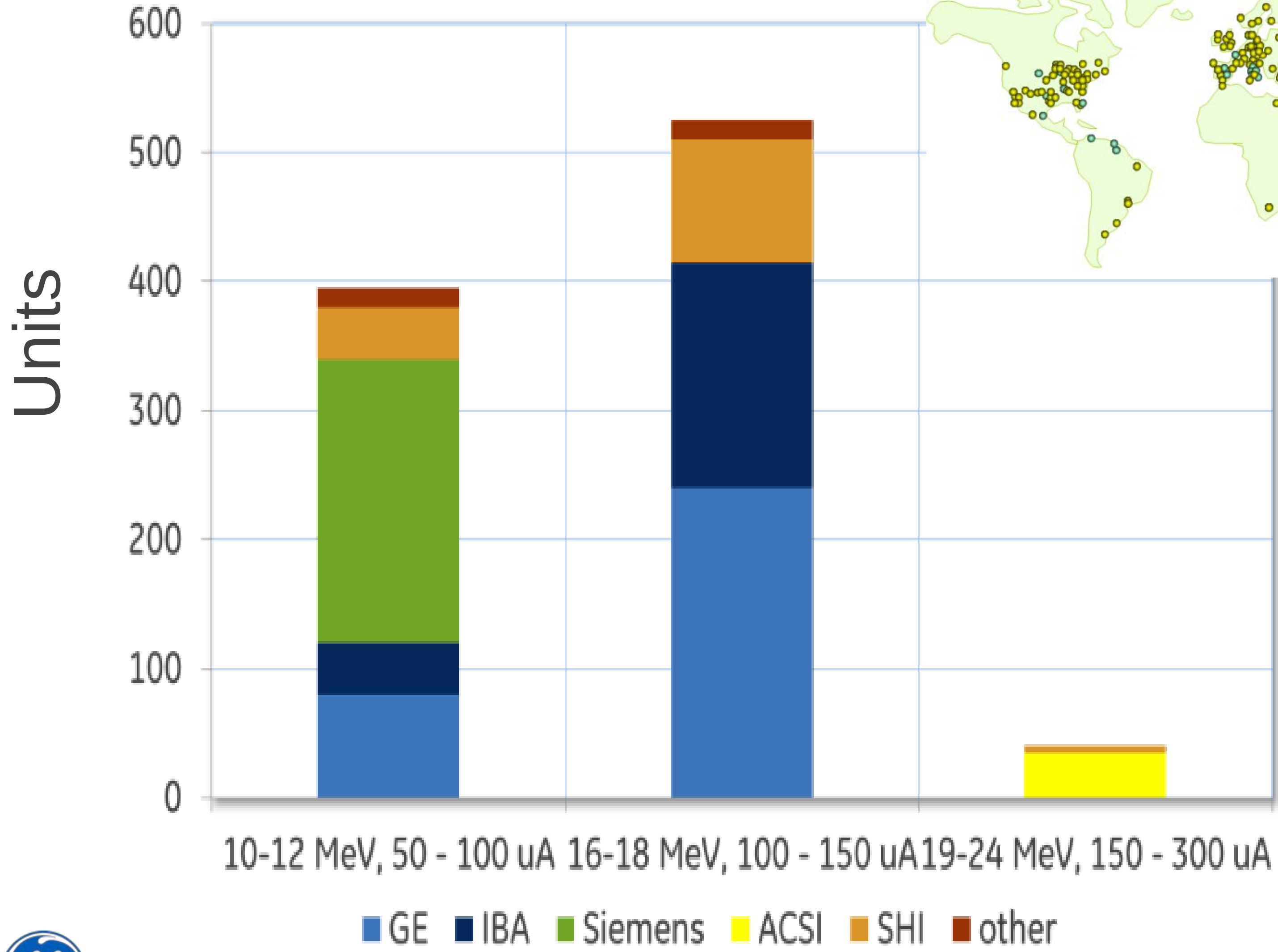
Today's Supply Chain

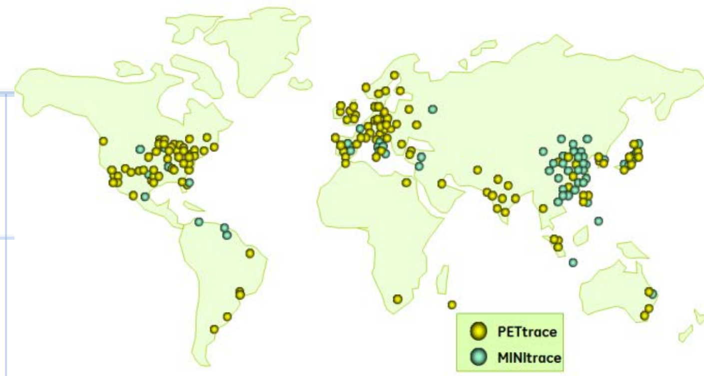


Tomorrow’s Supply Chain?



Medical Cyclotron Installed Base

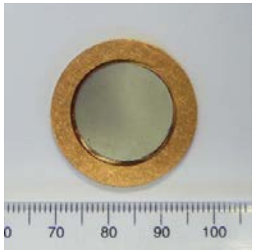


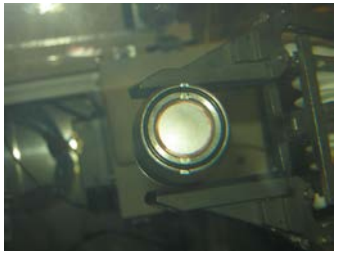


Cyclotron ^{99m}Tc Production

(left) TRIUMF-designed, GE PETtrace solid target capsule; (right) with mounted ^{100}Mo target Reference: P Schaffer, personal communication.

(Left) Enriched ^{100}Mo target mounted on a copper test backing; (Right) enriched ^{100}Mo after 6hr, 130 µA irradiation (Schaffer, 2014)





Beam Current (uA)	Production Volume (Ci)	Estimated Number of 25 mCi dose per 6 hour run (assuming 50% loss)
130 (IB)	5	100
250 (IB Upgrade)	10	200
400 (Future)	15	300

Some Challenges: Regulatory Path & ^{100}Mo Supply Model

In Summary

- Global supply chain challenges of ^{99}Mo, FCR, and conversion to LEU production will stress the current medical imaging supply chain.

- GE is positioned to maintain its current role as a provider of nuclear cameras, agents, ^{99}Mo generators, and radio pharmacies.

- With regulatory and support establishing a ^{100}Mo supply chain, a global introduction of cyclotron produced ^{99m}Tc may enable a stronger ORC position and local supply independence in 2017.
    - Also enables additional tolerance to program, economic, and engineering delays of the alternate production techniques entering the market from 2016 to 2020.

- Government, Industry, Academia and Entrepreneurs must collaborate to provide a stable supply of isotopes from today to beyond 2020.

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