Perspective on Nuclear Pharmacy’s Role in the Use of Non-HEU Mo-99 for Tc-99m Compounded Patient Preparations

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I have no conflicts of interest that I am aware of.

I do speak on behalf of myself, with the full awareness and approval of Triad Isotopes, Inc.
Learning Objectives

1. Understand what drives a nuclear medicine department to prescribe a dose compounded from Tc-99m sourced from Non-HEU Mo-99
2. Understand the process of generator receipt to final dose using HEU derived Mo-99
3. Understand the process of generator receipt to final dose using non-HEU derived Mo-99
A nuclear physician or technologist will call the pharmacy and they will order a Tc-99m compounded preparation for a patient scan.

- Do they order one where the Mo-99 came from HEU?
- Do they order one where the Mo-99 came from Non-HEU?
  - Medicare Hospital Outpatient doses receive an extra $10
  - Hospital policy may dictate the decision

There is no known *clinical difference* between a dose compounded with Tc-99m from a HEU Mo-99 generator and a Non-HEU Mo-99 generator.
Nuclear medicine physician’s or their designee will call and prescribe the radiopharmaceutical.

Doses are sent from our central nuclear pharmacy to the nuclear medicine department in batches.
- Call in day before and receive doses ~0500-0900
- Call in ~0600-0900 and receive doses ~0800-1300
- Call in doses ~1000-1300 and receive doses ~1300-1800

STAT one-off doses are often dispensed and delivered throughout the day.

To avoid delay, doses calibrated at 1800 and 2359 are often dispensed and delivered for use in emergency cases.
At the current time, it is unlikely a nuclear pharmacy will only have Non-HEU Mo-99 generators available, due to the following: greater expense, limited supply, limited availability on certain days of the week, and limited demand from end users.

Therefore, the process to compound the dose is complicated by logistics challenges that arise when a mix of HEU/Non-HEU Mo-99/Tc-99m generators are inventoried by the pharmacy.
“Normal” generator is eluted.
- This generator can only be used for doses that are not Non-HEU derived.
  - This is currently the majority of doses dispensed >99%

“Normal” Tc-99m pertechnetate elution is processed and entered into inventory.
- This elution can only be used for doses that are not derived from Non-HEU sources.

Tc-99m kit is compounded from elution and placed into inventory.
- This kit can only be used for doses that are not derived from Non-HEU sources.
Doses are drawn from compounded kit
- This dose is not labeled with any reference to HEU Mo-99 wording.

This dose may have a name on it or may not depending on Board of Pharmacy rules.
- This is still considered a patient specific dose.
Regardless, due to time constraints, if an immediate scan is required (for a variety of reasons), this dose may be used for another patient. When/if that occurs, an additional dose is prescribed for the pharmacy to dispense and deliver for the original patient.

This dose will not be available for any extra reimbursement if administered to a hospital outpatient covered by Medicare.

This dose will cost less to the end user due to the lower cost of the HEU Mo-99 generator.
Non-HEU Mo-99 generators

Non-HEU generator is eluted.
- This generator can be used for any patient, however the cost of this generator is more than the cost of a “normal” generator.
  - Pharmacy incurs the cost.
- This generator must be labeled as Non-HEU Mo-99 (from manufacturer and within pharmacy) for tracking and traceability purposes.

Non-HEU Tc-99m pertechnetate elution is processed and entered into inventory.
- This elution can used for any doses, but at a higher cost.
  - Pharmacy incurs the cost.
Non-HEU Mo-99 generators

- Tc-99m kit is compounded from elution and placed into inventory.
  - This kit can be used for any doses that are not Non-HEU, but at a higher cost.
    - Pharmacy incurs the cost.

- Doses are drawn from the compounded kit
  - This dose is labeled with reference to Non-HEU Mo-99 wording for extra reimbursement i.e. Mo-99 is 95% or more from Non-HEU production.
  - Cost is higher to end user and may exceed extra $10 reimbursement addition.

- This dose may have a name on it or may not, depending on Board of Pharmacy rules
  - Still patient specific
Regardless, due to time constraints, if an immediate scan is required (for a variety of reasons), this dose may be used for another patient. When/if that occurs, an additional dose is prescribed for the pharmacy to dispense and deliver for the original patient.

This dose will only be available for any extra reimbursement if administered to an individual who is a hospital outpatient covered by Medicare.

This dose will cost more to the end user due to the higher cost of the HEU Mo-99 generator, so obtaining the extra $10 reimbursement is important.
So What?

- Having a mix of Non-HEU and HEU Mo-99 derived generators can makes logistics challenging, as all contents must be kept separated and properly labeled.

- Sourcing higher priced Non-HEU generators adds considerable costs to a nuclear pharmacy, especially if demand isn’t available to efficiently use the elution and compounded kits.

- Currently there is little demand from end users for Non-HEU Mo-99 derived generators, due to increased cost and no known clinical advantages.
Questions?

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