

Division of Nuclear Medicine

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To: Medical Staff
Barnes-Jewish Hospital
St. Louis Children's Hospital
Barnes-Jewish West County Hospital
Heart Care Institute

From: Barry A. Siegel, MD
Director, Division of Nuclear Medicine

Re: Shortage of Mo-99/Tc-99m

As many of you may already have heard, there is an expected worldwide shortage of molybdenum-99 (Mo-99), which is the precursor of technetium-99m (Tc-99m), as a result of the two largest reactors, in Canada and the Netherlands, that supply this material being shut down for repairs. Tc-99m is the radionuclide used for nearly 80% of common nuclear medicine studies, including bone imaging, myocardial perfusion imaging and pulmonary perfusion imaging. Although sporadic shortages have occurred over the last two years, we have always managed to maintain our supply and to avoid disruption of clinical services. Despite some supply problems over the last few weeks, we have managed to meet the demand for nuclear medicine services. This week, we learned that some of our expected deliveries of Tc-99m would not occur. We now have reason to believe that, in the coming weeks, the supply disruption will be critical and we, and virtually every other nuclear medicine facility throughout the world, will have either no or very limited access to Tc-99m radiopharmaceuticals on some days.

We have already experienced some shortages over the last few weeks, and expect continuing difficulties during April and May.

To minimize the impact on patient care, we have made or expect to make a number of changes in our clinical procedures and examination scheduling, but plan to handle the situation flexibly day-to-day based on our allocation of Mo-99/Tc-99m. Some of the most important changes are as follows.

- On days when the supply of Tc-99m is critically limited, we will use thallium-201 (Tl-201) for stress/redistribution myocardial perfusion (largely with regadenason pharmacologic stress), rather than our usual dual-tracer (rest Tl-201/stress Tc-99m sestamibi or tetrofosmin) procedure. We have already had to do this for several days during the last two weeks. Note that this procedure is somewhat limited in patients weighing over 300 pounds, and we encourage you, whenever possible, to delay ordering studies in markedly obese subjects until Tc-99m is available. Please inform your patients that the Tl-201 procedure takes a little longer (approximately 5 hours) than the dual-tracer procedure they may have undergone in the past.

Note also that any studies done to evaluate for acute chest pain (most commonly requested by the emergency department) will require that the patient come to nuclear medicine for injection of the tracer to be followed by immediate imaging.

- We will reduce the administered activity of radiopharmaceuticals for most procedures, but will compensate for this with longer imaging times.
- We will be asking you (or your staff) whether certain elective procedures can either be done on an earlier or later date than you requested, in order to best match our expected supply of Tc-99m.
- We will let key services know that certain procedures that require patient admission or coordination with other services (e.g., Tc-99m Neurolite brain perfusion SPECT for epilepsy or carotid occlusion studies, and Tc-99m MAA studies for hepatic perfusion imaging) should not be scheduled during the periods of worst shortage.
- We will offer extended services on Saturday and, possibly, Sunday at BJH to maximize the use of any available Tc-99m supplies.
- We will require direct communication between an attending referring physician with a nuclear medicine attending physician to request emergency studies after Midnight, since these would require eluting a generator for one study, and reduce the supply available for use during normal working hours.
- At BJH, we will offer F-18 fluoride PET/CT bone scans for non-Medicare patients (this service is *nationally non-covered* by Medicare, and thus reimbursement is not even negotiable on a case-by-case basis). F-18 fluoride PET/CT is actually an outstanding bone imaging method (see http://www.ncbi.nlm.nih.gov/pubmed/18077529?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=8), but we have held back on making it available prior to this because of the reimbursement issue. Please note that, for patients on cancer clinical trials (or undergoing off-protocol therapy), where comparison with prior or subsequent bone scans is essential, the greater sensitivity of F-18 fluoride PET bone imaging will make comparison with conventional bone scans very difficult (and likely would be a protocol violation if bone imaging is a required study). Nuclear medicine physicians will be happy to discuss the advisability of using F-18 fluoride PET/CT in individual cases.

The shortage will not affect the supply of other radiopharmaceuticals, such as I-131, In-111 Octreoscan and In-111 labeled white blood cells, and will not affect our ability to provide FDG-PET studies.

We appreciate everyone's cooperation during this supply crisis, and hope you will be flexible in working with us. We will try our very best to offer services to as many patients as possible as quickly as possible, so as not to compromise patient care.