OPERATIONAL INSTRUCTIONS FOR THE COLLECTION, HANDLING AND SHIPMENT OF METAL FRAGMENTS REMOVED FROM DEPARTMENT OF DEFENSE PERSONNEL

The Joint Pathology Center, Biophysical Toxicology Laboratory

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Information Paper

BACKGROUND: Embedded metal fragments removed from surviving Department of Defense (DoD) personnel in DoD military treatment facilities (MTFs) will be analyzed for their chemical composition as established by HA Policy 07-029 (http://mhs.osd.mil/Content/docs/pdfs/policies/2007/07-029.pdf). The purpose of the policy is to analyze the fragments for a number of different metals and alloys, including lead, depleted uranium (DU), and tungsten which possibly could pose a long-term health hazard. The removed fragment(s) should be collected and sent to the Joint Pathology Center (JPC) using the following instructions:

I. Collection, handling and shipment of fragments only:

- The fragment(s) should be cleaned with distilled water to remove any remaining blood and tissue material.
- The fragment should be placed in a tightly sealed plastic specimen cup. The outside of the specimen cup should be labeled with the **patient's name, SSN, date sample collected, site of collection, surgical path number, and name of MTF.** Please ensure that the JPC Contributor's Consultation Request Form is filled-out in its entirety. This form may be downloaded from the JPC website at http://www.jpc.capmed.mil.
- The specimen cup should be placed in a "Biohazard" bag, sealed, and placed into a Styrofoam or equivalent insulating/cushioning container for shipment to the JPC.

II. Collection, handling and shipment of tissues and related biospecimens:

- Tissue specimens (i.e., capsular or connective tissues) associated with the metal fragment may be submitted for histological evaluation and chemical analysis. If available, the tissue specimen should be divided in two pieces, one for histology and one for biotoxicology metal analysis. The histology specimen should be placed in 10% formalin solution, whereas the specimen for biotoxicology analysis should be placed (without fixative) into a tightly sealed sterile plastic specimen container (urine/sputum specimen cup, for example). Place the specimen container in a sealed plastic bag with a "Biohazard" label. Whole blood should have EDTA preservative (lavender- or purple-top tubes). Wound fluid or other biospecimens for biotoxicology analysis should be in sterile acid-washed plastic containers. They should be maintained at -70°C and sent to the JPC in dry ice.
- Bodily fluids (including urine and serum) should be placed in the appropriate plastic specimen container and quickly frozen at -20°C. If available, wound fluid should be collected and included as part of the case material.

III. Specimen Requirements:

- ***Blood, plasma and/or serum:*** A total of 5 to6 mL of whole blood is normally sufficient to conduct bio-toxicology measurements. A sample volume of 1 to 2 mL of serum (or plasma) is normally sufficient for the toxicological metal analysis.
- ***Urine:*** A sample volume of ~20 to 50 mL is sufficient for the toxicological analysis. A minimum volume of 10 mL is required. Whenever possible, collecting a urine specimen before and after fragment removal is recommended.
- ***Tissue specimens:*** These could be obtained as punch biopsies (~3 mm core size; ~5-8 mg wet weight), at the time of fragment removal. A minimum of 6 to 10 mg of wet weight tissue is required. Prior to the chemical analysis and after sample drying, the minimum amount of tissue required to obtain meaningful and accurate biotoxicological results is ~1to 1.5 mg of dry tissue basis.
- ***Wound fluid:*** A minimum of 15 mL is required for biotoxicology studies.

The removed metal fragment should be shipped at ambient temperature; all other biological samples and should be shipped in dry ice. The package should be addressed as follows:

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