

Handling of Ocular and Adnexal Foreign Bodies Removed at DoD and VA Medical Facilities

This document is intended to provide the ophthalmologist with information about the proper handling of both intraocular and extraocular foreign body specimens to facilitate their analysis (including compositional analysis) and the timely transmission of these results to the treating ophthalmologist.

Understanding Ocular Foreign Bodies

Ocular foreign bodies, both extraocular and intraocular, can present a serious threat to vision. Metallic and other non-organic foreign bodies are associated with mechanical ocular injury, as well as delayed toxic and inflammatory damage. Organic foreign bodies are often highly inflammatory and may act as vectors for bacterial and fungal infections. MRI imaging is contraindicated when ferromagnetic foreign bodies are present, as the movement of these bodies induced by strong magnetic forces can cause significant ocular damage. Knowing the composition of ocular foreign bodies provides the ophthalmologist and other health care providers with critically important information for patient management.

The Department of Defense (DoD) and the Veterans Health Administration (VHA) have policies for the analysis of metal fragments and fragments of other composition removed from deployed or previously deployed U.S. Service members wounded in theater as a result of enemy or friendly fire (see references). The Joint Pathology Center (JPC) is a premier Defense Health Agency reference center that can perform compositional analysis of fragments for DoD and Veterans Affairs (VA) contributors.

Process for Submission of Ocular Foreign Bodies for Analysis

- Foreign bodies removed at DoD and VA medical facilities should be accessioned through the facility's pathology department and sent to JPC.
- The specimens should be accompanied by appropriate documentation, including the JPC consultation submission form which can be found at http://www.jpc.capmed.mil/docs/consultation_request_form.pdf. Any specific issues and requests should be discussed directly with JPC.
- Ophthalmologists and pathology departments should be advised to treat the specimens in strict compliance with JPC guidelines to minimize contamination.
- The JPC pathology report is sent to the submitting pathology department, and the ophthalmologist should receive a copy from them.

Preparing Foreign Bodies for Transport

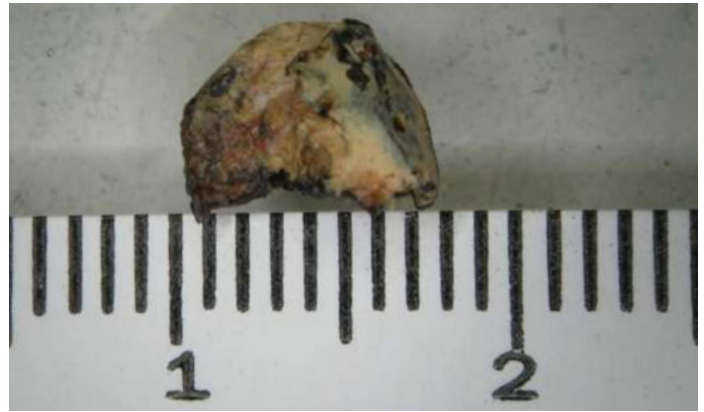
The guidelines below should be used when preparing foreign bodies for transport.

- Place metallic foreign bodies unwrapped in sealed plastic (polypropylene) containers containing 70% ethanol, labeled with at least two patient identifiers, date, site of specimen and specimen number.
- To prevent any interference with foreign body analysis:
 - DO NOT wrap or place foreign bodies in any material including: paper, cardboard, or tissue, gauze, tape, cloth, weck cells, foam, and wax or putty
- Place all organic foreign materials (e.g., tissue specimens, animal parts, etc.) in formalin.
- The JPC will extract foreign bodies contained within tissue specimens.
- All fluids known or suspected to contain foreign bodies (e.g., vitrectomy fluids, anterior chamber wash-outs, wound irrigation fluid, etc.) should be sent in the original container used for their collection. If these are prone to leak, they should be placed within a secondary plastic sealed container. The JPC will spin down the fluid to obtain all foreign material.

JPC Analysis of Foreign Bodies

Analysis of foreign bodies by JPC includes the following:

- Weight and size measurement
- Photographic documentation
- Comprehensive compositional and chemical analysis including:
 - Presence of radioactivity and depleted uranium (all foreign bodies removed from active duty Service members are screened for radioactivity)
 - Elemental analysis for toxic metals (e.g., copper, cobalt, iron, lead, etc.)
 - Identification of insect, animal parts, plant debris, paper, plastic, glass and other similar material
 - Evaluation of environmental debris
- Microscopic analysis, surface characterization, and determination of chemical composition
- Analytic methodologies include: scanning electron microscopy with energy dispersive X-ray analysis (SEM-EDXA), fourier transform infrared microspectroscopy (FTIR), inductively coupled plasma mass spectrometry (ICPMS), and energy dispersive X-ray fluorescence analysis (EDXRF)



Metallic foreign body removed from the eye. JPC's Pathology Department will provide the ophthalmologist with results of the foreign body analysis.

Additional Information

- A policy statement from the JPC that will further specify specific proper procedures for handling of foreign bodies is under development.
- A JPC consultation fee is charged at applicable interagency service rates for the analysis of specimens received from VA medical facilities, but not for those received from DoD facilities.
- It is recommended that military and VA ophthalmologists contact Dr. Michael Lewin-Smith, the JPC environmental pathologist overseeing foreign body analysis, with any specific questions regarding the handling and analysis of foreign bodies.

For questions and information regarding the JPC or specific specimens contact

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JPC General Information

1-855-393-3904

Visit JPC's website

<http://www.jpc.capmed.mil>

REFERENCES

- 1 The Assistant Secretary of Defense (December 18, 2007). *HA Policy: 07-029 Policy on Analysis of Metal Fragments Removed from Department of Defense Personnel.*
- 2 Department of Veterans Affairs (June 9, 2010). *VHA Directive 2010-029, Screening and Evaluation of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) Veterans with Embedded Fragments.*