



DHCC

DEPLOYMENT HEALTH CLINICAL CENTER

Operation Iraqi Freedom (OIF) Management of Depleted Uranium Exposures

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OIF Depleted Uranium (DU) Medical Management *Objectives*



- ★ Discuss Background Information:
 - What is DU; Where is it found; Possible exposures; and Potential health risks
- ★ Describe OIF DU Medical Management Policies
 - ★ Health Affairs Policy 03-012
 - Policy requirements: Exposure assessments; collection and processing of DU bioassays; embedded fragments; archiving records and case management; and referral to VA DU Medical Follow-up Program
- ★ Identify ways to obtain additional information

Background

Depleted Uranium (DU)



- ★ Depleted uranium (DU) is derived from naturally occurring uranium ore
- ★ Natural uranium is ubiquitous
 - Various amounts in food and water depending on locality
- ★ DU = what remains after removal of more highly radioactive isotopes
- ★ DU is 40% less radioactive than natural uranium

Military Uses of DU



- ★ First used in combat by US -- 1991 Gulf War
- ★ DU armor-piercing munitions are highly effective
 - Used in several US weapons systems
 - High-density/self-sharpening qualities ideal for use against enemy armored vehicles
- ★ DU armor used in Abrams tanks for enhanced protection
- ★ Unfortunately, in the fog of war, some US personnel may be exposed to DU through friendly fire accidents or other situations

DU External Exposures



- ★ External exposure to DU poses no health risks
 - External skin exposure from the radioactive properties of DU such as handling unexploded DU munitions or working in Abrams tanks for extended periods presents no health risks
 - Extended periods of skin contact with DU may result in some irritation/reddening of the skin which resolves when exposure ceases

DU Internal Exposures



- ★ When DU projectiles penetrate armor, the projectiles self-sharpen and produce small shards which
 - Can kill or wound
 - In the wounded, can result in internal exposure to DU due to embedded DU fragments
 - Can burn and create airborne DU dust (particulates) which can be inhaled, ingested, and contaminate wounds by those wounded or others exposed to the particulates resulting in internal DU exposures

Health Risks Associated with Internal Exposure



- ★ Theoretical health risks of internal DU exposure
 - Kidney damage is most probable outcome
- ★ Medical community yet to see any adverse health effects in those internally exposed to DU
 - Baltimore VA Medical Center DU Follow-up Program
 - Follows many of our more highly exposed 1991 Gulf War veterans
 - NO adverse health effects observed that can be attributed to DU's chemical or radiological properties
 - Longer term exposures remain of some concern

Urine DU Bioassays



- ★ Urine DU bioassays can be used to determine if internal exposure has occurred
 - Measures the amount of “total” uranium (i.e., natural and DU) being excreted in the urine, and the proportion, if any, contributed by DU
- ★ Urine DU bioassays form the basis of the ASD(HA) policy issued on 30 May 2003, *“Policy for Operation Iraqi Freedom Depleted Uranium Medical Management”* (HA Policy 03-012)

<http://www.ha.osd.mil/policies/2003/03-012.pdf>

HA Policy 03-012

OIF DU Medical Management



★ This policy was issued to:

- Document significant internal DU exposures
- Quantify and document individual radiation dosages
- Identify personnel with embedded fragments
- Identify those who should be offered referral to the VA DU medical follow-up program
- Ensure DoD's commitment to the health and welfare of its personnel by fully addressing their health concerns

OIF DU Medical Management

Policy Requirements



- (1) Identification of servicemembers with possible internal DU exposures
 - Review of all DD Form 2796, Post-Deployment Health Assessment, for DU exposure concerns
 - Review of operational events, including friendly fire accidents, fires involving DU, or salvage operations that may have resulted in DU exposures
- (2) Healthcare providers to accomplish a DU exposure assessment (qualitative) with those referred to them to determine level of exposure

OIF DU Medical Management

Policy Requirements (cont.)



- (3) Urine DU bioassays to be performed on certain individuals with possible internal DU exposures
- (4) Healthcare providers or PCMs offer referral to Baltimore VA DU Medical Follow-up Program to some with documented internal DU exposure
- (5) Use effective health risk communication tools
 - ★ Ensure those exposed to DU understand
 - the exposure assessment
 - urine DU bioassay results
 - if applicable, the VA referral
 - have all their questions fully answered

Policy Requirements

Exposure Assessments & Bioassays



- ★ Healthcare providers and evaluated personnel jointly complete DoD DU Exposure Questionnaire and Health Survey Instrument
 - DoD Test Forms on the PD Health website
 - Later available as a single SF-600 overprint
- ★ Healthcare providers categorize each individual with possible exposure as Level I, Level II, or Level III
- ★ Bioassays are required for all level I and II exposures
- ★ Bioassays are not required for level III exposures

Policy Requirements

Exposure Assessments & Bioassays *(cont.)*



- ★ Level I exposures - struck by DU munitions/armor fragments or were in, on, or near (< 50m) armored vehicles when struck. Includes first responders/ rescuers
- ★ Level II exposures - those other than first responders, who routinely entered vehicles possibly contaminated with DU dusts. Includes those whose duties required them to fight fires involving DU materials
- ★ Bioassays for level I and II personnel - must be performed as soon as possible and preferably within 180 days post-exposure (If more than 180 days have elapsed, bioassays are still required)

Policy Requirements

Exposure Assessments & Bioassays (cont.)



- ★ Level III exposures are “incidental” and would likely not result in significant DU uptake
 - Examples include infrequently and for short periods:
 - Entering into/climbing on armored vehicles disabled by DU munitions
 - Breathing smoke from fires involving DU materials
 - No urine bioassays are required for level III exposures, though healthcare providers may perform one based on medical indications or requests from those exposed

Policy Requirements

Processing Urine Samples



- ★ The collection and processing of the urine DU bioassays must be in accordance with this policy and with supplemental information available on the DHCC website
- ★ 24-hour urine sample provide an estimate of the amount of soluble uranium (natural and depleted) internalized:
 - Begins after first void on first day and ends after first morning void on the following day
 - Ideally collected within first 180 days post-exposure but still collect if after 180 days

Policy Requirements

Processing Urine Samples (cont.)



- ★ If still in theater and collection of 24-hour sample is not feasible, then collect a spot urine sample - morning "first void" sample of at least 120 mls
- ★ An additional 24-hour sample collected 7-10 day post-exposure is required if the initial 24-hour sample collection began between 24-48 hours post-exposure.
 - Useful in monitoring rates of uranium excretion

Policy Requirements

Processing Urine Samples (cont.)



- ★ Analyses to be performed by Service approved laboratories
 - Contact lab for shipping instructions
 - Lab requests include along with standard information:
 - Name, SSN, age, sex, height, weight of individual
 - Estimated dates(s) of exposure
 - Dates/times of urine collection type of sample (24 hour, 7-10 day, spot, repeat)
 - Request for total uranium; uranium isotopic analysis; and urine creatinine tests (run on an aliquot of entire sample) if not accomplished by the collecting lab

Policy Requirements

Processing Urine Samples (cont.)



- Request results be (a) normalized using the urine creatinine result [nanograms of uranium/gm of urine creatinine] and (b) normalized to the volume of the urine [nanograms of uranium/liter of urine]

Policy Requirements

Analysis of Embedded Fragments



- ★ Send fragments removed from the wounded to an approved laboratory for analysis of the metal composition
 - Analysis is useful in verifying the source of DU exposure and identifying the composition of other fragments that may pose potential health risks



Policy Requirements

Archiving & Case Management



- ★ Individual medical records must contain copies of all records pertaining to DU exposure assessment, bioassay results, fragment analysis, and risk communications messages delivered
- ★ Copies of all such documentation must be sent to the DoD Deployment Health Clinical Center (DHCC) at Walter Reed Medical Center for archiving
- ★ DHCC will monitor the case management of exposed personnel and ensure they receive any necessary medical follow-up

Policy Requirements

Archiving & Case Management (cont.)



- ★ All level I or level II exposed personnel with documented DU exposure (positive bioassay) will be offered referral to the Baltimore VA Medical Center's DU Medical Follow-up Program
 - The primary care manager or healthcare provider involved will coordinate with the DHCC to arrange referral
 - DHCC serves as the liaison with the Baltimore VA Medical Center for referrals

Questions, Information, Assistance



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