

**EVALUATION PROTOCOL FOR NON-GULF WAR VETERANS WITH  
POTENTIAL EXPOSURE TO DEPLETED URANIUM (DU)**

- 1. PURPOSE:** This Veterans Health Administration (VHA) Handbook outlines the procedures for evaluating non-Gulf War (GW) veterans with possible exposure to depleted uranium (DU). *NOTE: For GW veterans, including those who served in Operation Iraqi Freedom (OIF), refer to VHA Handbook 1303.1.*
- 2. SUMMARY OF CHANGES:** Service personnel from non-Gulf War conflicts, such as Bosnia, may have possible inhalation exposure to DU. According to Public Law 102-585, Section 703(b)(2), each Department of Veterans Affairs (VA) facility must offer a DU screening evaluation to veterans of these conflicts using the DU Evaluation Protocol. Veterans eligible for this evaluation and inclusion in VA's DU Registry Program (not the Gulf War Registry Program) are identified and referred by the Department of Defense or are self-referred.
- 3. RELATED ISSUES:** VHA Handbook 1303.1.
- 4. RESPONSIBLE OFFICE:** The Chief Public Health and Environmental Hazards Officer (13) is responsible for the contents of this Handbook. Questions about DU must be addressed to the Baltimore DU Follow-up Program at 1-800-815-7533; general questions about the protocol may be addressed to the Environmental Agents Service at (202) 273-8580.
- 5. RESCISSIONS:** VHA Handbook 1303.4, dated March 30, 2004, is rescinded.
- 6. RECERTIFICATION:** This VHA Handbook is scheduled for recertification on or before the last working day of September 2009.

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Acting Under Secretary for Health

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## EVALUATION PROTOCOL FOR NON-GULF WAR VETERANS WITH POTENTIAL EXPOSURE TO DEPLETED URANIUM (DU)

### 1. PURPOSE

This Veterans Health Administration (VHA) Handbook outlines the procedures for evaluating non-Gulf War (GW) veterans with possible exposure to DU. **NOTE:** For GW veterans, including those who served in Operation Iraqi Freedom (OIF), refer to VHA Handbook 1303.1.

### 2. BACKGROUND

a. DU is natural uranium left over after most of the U-235 isotope has been removed, such as that used as fuel in nuclear power plants. DU possesses about 60 percent of the radioactivity of natural uranium; it is a radiation hazard primarily if internalized, such as in shrapnel, contaminated wounds, and inhalation. In addition to its radioactivity, DU has some chemical toxicity related to being a heavy metal (similar to lead).

b. Testing of DU for possible military use began in the early 1960's and was first used by the United States military in projectiles and armor for tanks during the Gulf War, which began in 1990, and continues to the present (see Title 38 United States Code (U.S.C.) § 101(33)). DU has also been used in other conflicts, such as OIF and Bosnia. Service personnel who may have had potential inhalation exposure to DU include those on, in, or near vehicles hit with "friendly fire;" rescuers entering burning vehicles; individuals near fires involving DU munitions; individuals salvaging damaged vehicles; and those near burning vehicles.

c. The medical effects of DU exposure are continuing to be evaluated. A group of GW veterans with retained DU fragments or DU-contaminated wounds is being followed at a special DU Program at the Department of Veterans Affairs (VA) Medical Center, Baltimore, MD. While no clinically significant adverse effects of DU have been evident to date in this group, some abnormalities have been detected on specialized testing. **NOTE:** As of year 2003 the Baltimore DU Follow-up Program has seen 70 veterans.

d. The Baltimore DU Follow-up Program has determined that for friendly-fire victims, a 24-hour urine determination for uranium is a more sensitive screening test for DU than whole-body counting.

e. The Austin Automation Center (AAC) functions as the "contractor" to VHA in providing national level computer support for this DU program.

**NOTE:** For additional background information on DU, see the references in paragraph 6.

### 3. SCOPE

Each VHA facility must offer a DU screening evaluation using the DU Evaluation Protocol (App. A and App. B) to any veteran eligible for listing, or inclusion, in VA's DU Registry Program (for authority see Public Law 102-585, § 703(b)(2)). Veterans eligible for listing, or

inclusion, in this Registry include veterans identified and referred by the Department of Defense (DOD) because of possible DU exposure, or veterans who self-refer because they are concerned about their potential exposure to DU.

#### 4. PROCEDURE

a. Evaluation of veterans for potential DU exposure must be provided by either a primary care clinician, or the Environmental Health Clinician, utilizing the DU Evaluation Protocol described in Appendix A, VA Form 10-9009D, DU Questionnaire, and Appendix B, DU Consult Urine Instructions. Components of the DU evaluation include the DU exposure questionnaire and a 24-hour urine collection for creatinine and uranium.

b. Any positive responses to the DU exposure questionnaire must be followed-up with a more detailed history-taking by the VA primary care provider. The full-exposure history must be recorded in the veteran's consolidated health record (CHR) and/or the computerized patient record system (CPRS). All free text on the DU exposure questionnaires must be included in the CHR or CPRS. Completed DU exposure questionnaires are to be transmitted to the AAC via website <http://vaww.registries.aac.va.gov/index.asp>.

c. The health care provider must contact the DU Follow-up Program at the Baltimore VA Medical Center (1-800-815-7533) to discuss obtaining a 24-hour urine collection for uranium. *NOTE: The 24-hour urine collection for uranium must be performed in accordance with instructions in Appendix B.*

d. Upon completion of the evaluation protocol, the DU exposure questionnaire must be transmitted by the Environmental Health Coordinator (EHC) via website <http://vaww.registries.aac.va.gov/index.asp> to the DU Registry database.

e. Results of the 24-hour urine for uranium are communicated directly to the veteran by letter from the Baltimore DU Follow-up Program with a copy to the VA referring physician for the veteran's CHR and/or CPRS. The Baltimore DU program staff transmits the urine uranium results to AAC via website <http://vaww.registries.aac.va.gov/index.asp>.

f. Follow-up actions for any veteran with an elevated 24-hour urine uranium determination must be individualized based on discussion between the veteran's primary VA clinician and the staff at the Baltimore DU Follow-up Program.

#### 5. RESPONSIBILITIES

a. **Facility Director.** The Facility Director is responsible for ensuring that clinicians, coordinators, and other appropriate staff follow the policies and procedures required to evaluate non-Gulf War and non-Operation Iraqi Freedom veterans with potential exposure to DU as mandated in this Handbook.

b. **Baltimore DU Program Staff.** The Baltimore DU program staff is responsible for:

- (1) Arranging for testing of urine samples for uranium.

(2) Sending, by letter, the results of the 24-hour urine for uranium directly to the veteran with a copy to the VA referring clinician.

(3) Transmitting the urine uranium results to AAC via registry website <http://vaww.registries.aac.va.gov/index.asp>

(4) Providing consultative advice to VA clinicians regarding DU testing.

**NOTE:** Active-duty service members concerned about DU exposure, or other health issues related to service in the Gulf or other conflicts, need to be advised to contact a military health treatment facility or call the DOD Gulf War Veteran's Hotline at 1-800-796-9699. Additional information about DOD's post-deployment health care program initiatives is available on its Deployment LINK website: <http://deploymentlink.osd.mil/>.

## 6. REFERENCES

a. Voelz, George L., Chapter 13 - "Uranium," in Hazardous Material Toxicology, Eds. Sullivan, John B. and Krieger, Gary R., Williams and Wilkins, Baltimore, MD, 1992.

b. Health Effects of Depleted Uranium - Fact Sheet, DOD, June 11, 1993. **NOTE:** Copies may be obtained by calling (703) 697-3189.

c. "Agency for Toxic Substances and Disease Registry," United States Public Health Service, 1990.

d. Toxicologic Profile for Uranium. PB91-180 471, U.S. Department of Commerce, National Technical Information Service. **NOTE:** The Customer Service number is (703) 487-4660.

e. McDiarmid, et al., "Health Effects of Depleted Uranium on Exposed Gulf War Veterans," Environmental Research. Section A, Vol. 82, pages 168-180, 2000.

f. McDiarmid, et al., "Urinary Uranium Concentrations in an Enlarged Gulf War Veterans Cohort," Health Physics, Vol. 80, No. 3, pages 270-273. 2001.

g. McDiarmid, et al., "Surveillance of Depleted Uranium Exposed Gulf War Veterans: Health Effects Observed in an Enlarged "Friendly Fire" Cohort," Journal of Environmental Medicine. Vol. 4, No. 12, pages 991-1000, December 2001.

h. VHA website: <http://vaww.va.gov/gulfwar/>



DEPLETED URANIUM QUESTIONNAIRE, Continued	SSN									
<b>Instructions:</b> Choose one of the following codes for Questions 11 through 39, unless other codes are listed or a narrative response is required: Code "Y" = Yes Code "N" = No Code "D" = Don't Know										
									(a) BLOCK	(b) CODE
11. WERE YOU A LOGISTICS ASSISTANCE REPRESENTATIVE (LAR) WHO INSPECTED DEPLETED URANIUM CONTAMINATED SYSTEMS TO DETERMINE REPAIRABILITY?									105	
12. WERE YOU A MEMBER OF A BATTLE DAMAGE ASSESSMENT TEAM (BDAT) WHO EXAMINED U.S. COMBAT VEHICLES KNOWN, OR SUSPECTED TO BE, DAMAGED OR DESTROYED BY DU?									106	
13. WERE YOU A MEMBER OF THE 144 SERVICE AND SUPPLY COMPANY WHO PROCESSED DAMAGED EQUIPMENT, INCLUDING SOME WITH DU CONTAMINATION?									107	
14. WERE YOU A MEMBER OF A RADIATION CONTROL (RADCON) TEAM DEPLOYED IN THE PERSIAN GULF?									108	
15. WERE YOU INVOLVED IN THE EXAMINATION OR RECOVERY OF DAMAGED OR DESTROYED ENEMY VEHICLES?									109	
16. WERE YOU INVOLVED IN THE DOWNLOADING OF EQUIPMENT OR MUNITIONS FROM VEHICLES KNOWN OR SUSPECTED TO BE CONTAMINATED BY DU?									110	
17. WERE YOU A MEMBER OF A UNIT MAINTENANCE TEAM PERFORMING MAINTENANCE ON OR IN SYSTEMS KNOWN OR SUSPECTED TO BE CONTAMINATED BY DU?									111	
18. WERE YOU AT DOHA ON JULY 11, 1991, AT THE TIME OF THE FIRE?									112	
18a. WERE YOU DIRECTLY INVOLVED IN CLEAN-UP OPERATIONS FOLLOWING THE DOHA EXPLOSION AND FIRE?									112a	
18b. WERE YOU EXPOSED TO SMOKE FROM BURNING DOHA ROUNDS?									112b	
19. WERE YOU IN OR ON A VEHICLE HIT BY ENEMY FIRE AT THE TIME IT WAS HIT? IF "NO," SKIP TO QUESTION 20.									113a	
19a. IF "YES," WHAT TYPE OF A VEHICLE?										
19a(1) Code "a" = ABRAMS battle tank									113b	
19a(2) Code "b" = BRADLEY fighting vehicle									113c	
19a(3) Code "c" = Other (identify) :									113d	
19a(4) Code "d" = Don't know									113e	
19b. IF "YES," WAS THE VEHICLE HIT BY DU MUNITIONS?									113f	
20. DID YOU ENTER AN ABRAMS BATTLE TANK TO PERFORM RESCUE OPERATIONS IMMEDIATELY AFTER IT WAS STRUCK BY ENEMY FIRE?									114	
21. DID YOU ENTER AN ABRAMS BATTLE TANK TO RETRIEVE SENSITIVE ITEMS IMMEDIATELY AFTER IT WAS STRUCK BY ENEMY FIRE?									115	
22. DID YOU ENTER A BRADLEY FIGHTING VEHICLE TO PERFORM RESCUE OPERATIONS IMMEDIATELY AFTER IT WAS STRUCK BY ENEMY FIRE?									116	
23. DID YOU ENTER A BRADLEY FIGHTING VEHICLE TO RETRIEVE SENSITIVE ITEMS IMMEDIATELY AFTER IT WAS STRUCK BY ENEMY FIRE?									117	

DEPLETED URANIUM QUESTIONNAIRE, Continued				SSN														
												(a) BLOCK	(b) CODE					
24. WERE YOU IN OR ON ANY VEHICLE HIT BY FRIENDLY FIRE AT THE TIME IT WAS HIT? IF "NO," SKIP TO QUESTION 25. Code "Y" = Yes      Code "N" = No      Code "D" = Don't Know												118						
24a. IF "YES," WHAT TYPE OF VEHICLE?																		
24a(1) Code "a" = ABRAMS battle tank												118a						
24a(2) Code "b" = BRADLEY fighting vehicle												118b						
24a(3) Code "c" = other (identify below)												118c						
24a(4) Code "d" = Don't Know												118d						
24b. WAS THE VEHICLE HIT BY DU MUNITIONS?												118e						
25. DID YOU ENTER AN ABRAMS BATTLE TANK TO PERFORM RESCUE OPERATIONS IMMEDIATELY AFTER IT WAS STRUCK BY FRIENDLY FIRE?												119						
26. DID YOU ENTER AN ABRAMS BATTLE TANK TO RETRIEVE SENSITIVE ITEMS IMMEDIATELY AFTER IT WAS STRUCK BY FRIENDLY FIRE?												120						
27. DID YOU ENTER A BRADLEY FIGHTING VEHICLE TO PERFORM RESCUE OPERATIONS IMMEDIATELY AFTER IT WAS STRUCK BY FRIENDLY FIRE?												121						
28. DID YOU ENTER A BRADLEY FIGHTING VEHICLE TO RETRIEVE SENSITIVE ITEMS IMMEDIATELY AFTER IT WAS STRUCK BY FRIENDLY FIRE?												122						
29. DID YOU ENTER ANY ENEMY VEHICLE TO PERFORM RESCUE OPERATIONS IMMEDIATELY AFTER IT WAS STRUCK BY OUR FIRE? IF "NO," SKIP TO QUESTION 30.												123						
29a(1) Code "a" = Tank												123a						
29a(2) Code "b" = Other tracked vehicle (identify below)												123b						
29a(3) Code "c" = Truck												123c						
29a(4) Code "d" = Other wheeled vehicle (identify below)												123d						
29a(5) Code "e" = Other type vehicle (identify below)												123e						
29a(6) Code "f" = Don't know												123f						
30. DID YOU ENTER ANY ENEMY VEHICLE TO RETRIEVE SENSITIVE ITEMS OR INTELLIGENCE MATERIAL IMMEDIATELY AFTER IT WAS STRUCK BY OUR FIRE? IF "NO," SKIP TO QUESTION 31.												124						
30a. IF "YES," WHAT TYPE OF VEHICLE?																		
30a(1) Code "a" = Tank												124a						



DEPLETED URANIUM QUESTIONNAIRE, Continued				SSN:															
																(a) BLOCK	(b) CODE		
30a(2) Code "b" = Other tracked vehicle (identify below)																124b			
30a(3) Code "c" = Truck																124c			
30a(4) Code "d" = Other wheeled vehicle (identify below)																124d			
30a(5) Code "e" = Other type vehicle (identify below)																124e			
30a(6) Code "f" = Don't know																124f			
31. WERE YOU EXPOSED TO SMOKE FROM ANY ENEMY EQUIPMENT STRUCK BY DU ROUNDS?																125			
32. DID YOU REMOVE EQUIPMENT OR OTHER ITEMS FROM A DAMAGED OR DESTROYED U.S. OR ENEMY VEHICLE? IF "NO," SKIP TO QUESTION 33.																126			
32a If you removed something from a vehicle, please describe it below:																126a			
32b Do you still have equipment or other items removed from a damaged or destroyed U.S. or enemy vehicle?																126b			
33. WERE YOU WITHIN 50 METERS (45.72 YARDS) OF A VEHICLE WHEN IT WAS HIT (NOT INCLUDING VEHICLES YOU WERE IN OR ON THAT WERE HIT)? IF "NO," SKIP TO QUESTION 34.																127			
33a. IF YES, WHAT TYPE OF VEHICLE?																			
33a(1) Code a = ABRAMS battle tank																127a			
33a(2) Code b = BRADLEY fighting vehicle																127b			
33a(3) Code c = other (identify below)																127c			
33a(4) Code d = Don't Know																127d			
33b. WAS THE VEHICLE HIT BY DU MUNITIONS?																127e			
34. DID YOU BREATH SMOKE OR DUST FROM VEHICLES HIT BY ENEMY OR FRIENDLY FIRE? IF "NO," SKIP TO QUESTION 35.																128			
34a. IF "YES," WHAT TYPE OF VEHICLE?																			
34a(1) Code "a" = ABRAMS battle tank																128a			
34a(2) Code "b" = BRADLEY fighting vehicle																128b			
34a(3) Code "c" = other (identify below)																128c			
34a(4) Code "d" = Don't Know																128d			
34b. WAS THE VEHICLE HIT BY DU MUNITIONS?																128e			

DEPLETED URANIUM QUESTIONNAIRE, Continued				SSN															
													(a) BLOCK	(b) CODE					
35. DID YOU CLIMB ON OR ENTER VEHICLES HIT BY ENEMY OR FRIENDLY FIRE SOMETIME AFTER THE IMMEDIATE POST-IMPACT RESCUE PERIOD? IF "NO," SKIP TO QUESTION 36.													129						
"Y" = Yes                      "N" = No                      "D" = Don't Know																			
35a. IF "YES," WHAT TYPE OF VEHICLE?																			
35a(1) Code "a" = ABRAMS battle tank													129a						
35a(2) Code "b" = BRADLEY fighting vehicle													129b						
35a(3) Code "c" = Other (identify below)													129c						
35a(4) Code "d" = Don't Know													129d						
35b. HOW MANY TIMES?																			
35b(1) Code "a" = 1 Time													129e						
35b(2) Code "b" = 2 Times													129f						
35b(3) Code "c" = 3- 10 times													129g						
35b(4) Code "d" = More than 10 times													129h						
35b(5) Code "e" = Don't know													129i						
35c. HOW LONG (IN TOTAL) WERE YOU ON BOARD THE VEHICLE(S)?																			
35c(1) Code "a" = Less than 5 minutes													129j						
35c(2) Code "b" = 5-15 minutes													129k						
35c(3) Code "c" = 16-30 minutes													129l						
35c(4) Code "d" = More than 30 minutes													129m						
35c(5) Code "e" = Don't know													129n						
35d. WAS THE VEHICLE KNOWN TO BE CONTAMINATED WITH DU?													129o						
36. DID YOU PASS WITHIN 50 METERS (45.72 YARDS) OF A DAMAGED OR DESTROYED VEHICLE? IF "NO," SKIP TO QUESTION 37.      "Y" = Yes      "N" = No      "D" = Don't Know													130						
36a. HOW LONG (IN TOTAL) AFTER THE DESTRUCTIVE EVENT?																			
36a(1) Code "a" = Less than 12 hours													130a						
36a(2) Code "b" = 12 hours - 24 hours													130b						

<b>DEPLETED URANIUM QUESTIONNAIRE, Continued</b>		SSN									
36a(3). Code "c" = more than 24 hours									130c		
36a(4). Code "d" = Don't know									130d		
36b. IF "YES," WHAT TYPE OF VEHICLE?											
36b(1) Code "a" = ABRAMS battle tank									130e		
36b(2) Code "b" = BRADLEY fighting vehicle									130f		
36b(3) Code "c" = Other (identify below)									130g		
36b(4) Code "d" = Don't Know									130h		
36c. WAS THE VEHICLE BURNING?      "Y" = Yes      "N" = No      "D" = Don't Know									130i		
37. WERE YOU WOUNDED AS A RESULT OR BEING IN, ON, OR WITHIN 50 METERS (45.72 YARDS) OF THE DAMAGED VEHICLE AT THE TIME IT WAS HIT? IF "NO," SKIP TO QUESTION 38.									131		
37a. WHERE YOU WOUNDED?											
37a(1) Code "a" = leg/foot									131a		
37b(2) Code "b" = arm/hand									131b		
37c(3) Code "c" = face/head									131c		
37d(4) Code "d" = neck									131d		
37e(5) Code "e" = body									131e		
37b. DO YOU HAVE RETAINED FRAGMENTS OR SHRAPNEL IN YOUR BODY?									131f		
38. DID YOU FIRE DU ROUNDS?									132		
39. DID YOU HANDLE BARE/DAMAGED DU PENETRATOR ROUNDS? IF "NO," SKIP TO QUESTION 40.									133		
39a. DID YOU HANDLE THE ROUNDS WITH GLOVES?									133a		
39b. DID YOU HANDLE THE ROUNDS WITH SHIELDING?									133b		
<b>OTHER EXPOSURES</b>											
40. DID YOU HAVE EXPOSURE TO DU THAT IS NOT CAPTURED BY THIS QUESTIONNAIRE?									134		
41. IF "YES," DESCRIBE BELOW:											
_____											
_____											
_____											



**DEPLETED URANIUM (DU) PROGRAM CHECKLIST 24-HOUR URINE  
URANIUM COLLECTION BALTIMORE VA MEDICAL CENTER**

**CONSULT URINE INSTRUCTIONS (REVISED 07/98)**

1. PATIENT NAME:		2. SOCIAL SECURITY NUMBER
3. ADDRESS		4. SPECIMEN DATE
5. TELEPHONE NUMBER	6. DATE OF BIRTH	
7. REFERRING VA MEDICAL CENTER AND ADDRESS		8. MAIL CODE
9. REFERRING PHYSICIAN		
10. PAGER NUMBER	11. TELEPHONE NUMBER	12. FAX NUMBER (To receive report)

Call the DU Program at 1-800-815-7533 to obtain the specimen collection kits. Each kit includes shipping materials and eight 500 ml containers to be used for the collection of urine over a 24 hour period. The materials in the kits conform to shipping regulations #173.199 and FEDEX shipping requirement (IATA Packing Instruction 650)).

The shipper of the diagnostic specimens assumes responsibility for complying with these shipping requirements. Using bottles and packing materials supplied by the DU Program, and using them according to directions, assures compliance.

Schedule patient for 24-hour urine collection.

DATE	A. TIME OF FIRST VOID (DISCARDED) URINE DAY 1	B. TIME OF FIRST VOID URINE DAY 2
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Instruct the patient to urinate directly into the collection container(s). Uranium sticks to the sides of the container. Therefore, do not transfer urine due to potential loss of analyte. Issue 8 containers to patient to ensure full 24-hour collection in approved containers.

Instruct the patient to collect urine beginning after first morning void of Day 1 and end collection after first morning void on Day 2 (the next day).

Seal containers as tightly as possible. Bag each urine container with absorbent material. Make sure each plastic bag is sealed tightly. The sample must be mailed in the package provided. *TIP: CONTACT YOUR LABORATORY SERVICES SUPERVISOR TO ASSIST IN PACKAGING.*

SEND SPECIMEN VIA FEDEX. Call the DU Program Office at 1-800-815-7533 as soon as specimen has been shipped.

**FEDEX TRACKING NUMBER:** \_\_\_\_\_

SEND TO:

**VA MEDICAL CENTER BALTIMORE  
PATHOLOGY AND LABORATORY MEDICINE SERVICE (113)  
10 N. GREENE STREET  
BALTIMORE, MARYLAND 21201**

**ATTN: CHEM. LAB (113) (FOR DU PROGRAM)**

Before sending this sample, call the DU Program office at 1-800-815-7533 so that delivery can be anticipated. This completed VA Form 10-9009F and the completed copy of VA Form 10-9009D must be faxed to the DU office at 410-605-7943 before sending the urine sample.

Another copy of this VA Form 10-9009F, sealed in a ziploc bag, must be enclosed with the sample for identification purposes.

**Notification of the results can be expected in approximately 45 days.**