



Operation Tomodachi Registry Clinician Information Packet



PURPOSE: This packet provides radiation exposure information for health care providers addressing health concerns of Service members, Veterans, Department of Defense (DoD) civilian employees, family members of Service members or DoD civilians, and DoD contractors who were exposed to low levels of radiation while on or near the mainland of Japan between March 12, 2011, and May 11, 2011.

BACKGROUND: Operation Tomodachi was the DoD humanitarian response to the March 11, 2011, Japanese earthquake, tsunami, and release of radiation from the Fukushima Daiichi Nuclear Power Station (FDNPS). In response to these events, DoD established the Operation Tomodachi Registry (OTR), which contains the names of, and maximum estimated radiation doses for, the approximately 75,000 members of this affected population who were exposed to low levels of radiation. The OTR serves as the authoritative DoD source for estimated radiation doses should they ever be needed for medical or other purposes. Individuals can download location-based radiation dose estimate reports through the OTR website at <http://registry.csd.disa.mil/otr>. The DoD also has inserted a clinical note with estimated radiation doses into the AHLTA records of more than 68,000 MHS beneficiaries who are in the OTR.

INDIVIDUAL CONSIDERATIONS AND CLINICAL EVALUATION: The maximum estimated radiation doses calculated for all members of the registry are well below levels associated with adverse medical conditions. However, for individuals exposed to radioactive material, cancer can be one of their greatest concerns, regardless of the dose. These individuals may be particularly concerned about the thyroid gland, since it can selectively absorb iodine, with I-131 being the most important radioactive isotope of iodine associated with nuclear reactor accidents. According to the National Cancer Institute, approximately 1 person out of 100 in the U.S. will be diagnosed with thyroid cancer during their lifetime as part of the normal background rate. As a result, some members of this cohort may be diagnosed with thyroid cancer in the future, regardless of the low-level radiation exposure they may have received from FDNPS. Compared to cancer incidence rates in a group with only background radiation exposure, any additional cancer risk from this radiation is extremely small, and would be undetectable from background incidence rates.

Patients may have other concerns related to this radiation exposure, such as infertility or the risk of birth defects in their children. These concerns can lead to emotional distress in some individuals. If severe, this stress may result in a variety of physical ailments such as weight fluctuations, sleep disturbances, diarrhea/constipation, and other unexplained symptoms that are unrelated to any exposure to radioactive material. It is important to listen closely to their concerns and address them in a forthright and reassuring manner that is based on the facts associated with the exposure estimates. Because the estimated doses and resulting health risks are so low, the DoD has not established a medical surveillance program to monitor the long-term health outcomes of individuals within the OTR. Physical exams or diagnostic tests are not indicated for anyone in this population solely due to the low radiation exposure, and conducting tests that do not provide information specifically relevant or useful to assess the individual's immediate or long-term health are unwarranted. Any physical exams or diagnostic tests performed should be guided by sound clinical judgment and the result of a shared decision with the patient/parent. For additional questions, DoD clinicians are asked to review the Frequently Asked Questions (FAQs) at the OTR website at <http://registry.csd.disa.mil/otr> or contact the OTR administrative staff at usarmy.tomodachi.registry@mail.mil. VA clinicians may contact the VA Office of Public Health at www.publichealth.va.gov.



Operation Tomodachi Registry Clinician Information Packet



MAXIMUM ESTIMATED SHORE-BASED RADIATION DOSES: Shore-based radiation dose estimates, including whole-body and thyroid doses, were calculated for 13 primary areas of Japan in which members of this registry were located. Thyroid doses were specifically analyzed because in children the thyroid gland is particularly sensitive to radioactive iodine (I-131), which was released from the damaged nuclear power station. Using actual radiation monitoring data and conservative dose estimation factors such as assuming all of the time was spent outside with continuously elevated breathing rates, radiation health experts determined the maximum estimated whole-body and thyroid doses for the approximately 58,000 shore-based adults and children in the OTR. Most individual doses will be smaller. (Individuals should refer to the OTR website to review the estimated dose for the region(s) where they were physically located.) The maximum estimated doses are shown below in millirem (mrem), rem, Sieverts (Sv), and millisieverts (mSv):

Adults:	mrem	rem	Sv	mSv
▪ Adult, maximum estimated whole-body dose:	120	0.12	0.0012	1.2
▪ Adult, maximum estimated thyroid dose:	1200	1.2	0.012	12
Children (<17 years of age):				
▪ Child, maximum estimated whole-body dose:	160	0.16	0.0016	1.6
▪ Child, maximum estimated thyroid dose:	2700	2.7	0.027	27

MAXIMUM ESTIMATED FLEET-BASED RADIATION DOSES: Fleet-based radiation dose estimates, including whole-body and thyroid doses, were calculated for approximately 17,000 individuals assigned to 25 ships located off the coast of Japan or docked at Sasebo Naval Base or Yokosuka Naval Base. Using modeled air activity concentrations, actual radiation monitoring data, shore-based doses (for in-port periods), and conservative dose estimation factors such as assuming all of the time was spent topside with continuously elevated breathing rates, radiation health experts determined the maximum estimated whole-body and thyroid doses for fleet-based adults within the OTR. Most individual doses will be smaller. (Individuals should refer to the OTR website to review the estimated dose corresponding to their specific ship.) The maximum estimated doses are shown below in millirem (mrem), rem, Sieverts (Sv), and millisieverts (mSv):

Adults:	mrem	rem	Sv	mSv
▪ Adult, maximum estimated whole-body dose:	35	0.035	0.00035	0.35
▪ Adult, maximum estimated thyroid dose:	340	0.34	0.0034	3.4

All dose estimates, including the assumptions and methods used, were peer-reviewed by members of the National Council on Radiation Protection and Measurements.



Operation Tomodachi Registry Clinician Information Packet



RADIATION DOSES FOR COMPARISON: The following whole-body and thyroid radiation doses are provided as a comparison (from high to low) to the maximum estimated doses (bold type) in the OTR.

Whole-body doses:	mrem	rem	Sv	mSv
▪ Occupational annual dose limit, adults ¹	5000	5	0.05	50
▪ Full body CT scan, adult	5000	5	0.05	50
▪ NRC annual dose limit, minors (<17 years of age) ²	500	0.5	0.005	5
▪ Average annual background radiation dose in U.S. ³	310	0.31	0.0031	3.1
▪ Child, maximum estimated whole-body dose (OTR)	160	0.16	0.0016	1.6
▪ Adult, maximum estimated whole-body dose (OTR)	120	0.12	0.0012	1.2
▪ X-ray of pelvis/hip	60	0.06	0.0006	0.6
▪ Conventional chest x-ray	10	0.01	0.0001	0.1
▪ Airplane flight from Los Angeles to Tokyo	4.6	0.0046	0.000046	0.046

Thyroid doses:	mrem	rem	Sv	mSv
▪ Occupational annual dose limit, adults ¹	50000	50	0.5	500
▪ CT of the cervical spine, child	5200	5.2	0.052	52
▪ NRC annual dose limit, minors (<17 years of age) ²	5000	5	0.05	50
▪ CT of the cervical spine, adult	4400	4.4	0.044	44
▪ Child, maximum estimated thyroid dose (OTR)	2700	2.7	0.027	27
▪ Nuclear medicine thyroid scan	2000	2	0.02	20
▪ Adult, maximum estimated thyroid dose (OTR)	1200	1.2	0.012	12
▪ CT of the head, children	900	0.9	0.009	9

¹ Nuclear Regulatory Commission 10 CFR §20.1201 Occupational dose limits for adults

² Nuclear Regulatory Commission 10 CFR §20.1207 Occupational dose limits for minors

³ Includes background radiation from space, terrestrial, internal, as well as radon and thoron sources (NCRP Report No. 160)