



Just the Facts... **Radio Frequency Radiation - Medical**

RADIO FREQUENCY SOURCES PROLIFERATE IN ALL ARMY/DoD ENVIRONMENTS

GENERAL INFORMATION	Radio frequency radiation (RFR) is the movement or propagation of nonionizing energy through space in the form of varying electric (E) and magnetic (H) fields. RFR sources used by the DoD typically operate at frequencies in the 2 MHz to 100 GHz frequency band of the electromagnetic spectrum. Scientists generally categorize RFR as nonionizing radiation because it does not have sufficient energy to cause ionization of atoms or molecules. As such, it cannot cause genetic damage or cell mutation.
ROUTINE USES IN THE DEPLOYED SETTING	Radar Systems: Target/missile tracking radar, acquisition radar, weather radar, and surveillance radar. PATRIOT, FIREFINDER, SENTINAL. Communications Systems: vehicular ground-to-air radios, man-pack radios, cellular radios, portable radios, satellite communications (SATCOM) systems, and avionics radios. SINGARS, JTRS, STAR-T. Electronic Countermeasures Systems. GUARDRAIL, PROPHET.
PERSONAL PROTECTIVE EQUIPMENT (PPE) and COUNTERMEASURES AVAILABLE FOR DEPLOYED PERSONNEL	PPE's such as detection badges are currently not recommended, as they often are not reliable indicators of overexposure to RFR. These devices are generally only effective when the wearer is directly facing an RFR transmitting antenna. Wearable devices can give a false sense of security. They may not activate if the individual is not directly facing the transmitting antenna. Observance of RFR safety protection procedures is more effective than PPE in protecting personnel.
LEVELS OF EXPOSURE COMMONLY FOUND	RFR levels in most Army tactical and training environments, where personnel are working, are typically much lower than permissible exposure limits (PELs). Ambient levels found in these environments are similar to RFR levels in typical city environments. RFR levels will be higher near radars and radios but will not necessarily exceed PELs. Prior to fielding, all RFR transmitting sources operated by the Army/DoD are evaluated to determine necessary safety procedures to protect personnel. When operated using the recommended safety guidance, personnel should not be exposed to RFR levels that exceed permissible limits. The exact type, extent of use, and number of sources operated by a particular activity will determine the specific radiation protection guidelines to be observed.
AVAILABLE EXPOSURE DATA	Be sure to mention to your health care worker if Preventive Medicine personnel have evaluated your work area or any tasks that you have performed.

<p>SIGNS & SYMPTOMS EXPOSURE</p>	<p>The only established effect of RFR exposure is thermal heating of the body. As such, excessive heating could cause localized damage to tissues or heat stress. Symptoms would typically be a warming sensation of the skin and/or reddening of the skin. However, the sensation of warmth alone is not an indication of an RFR overexposure.</p> <p>Additionally, physical contact with metal antenna components (such as from a dipole or monopole antenna or metal structures near these antenna types) can produce RF burns/shocks. An RF burn could result if one were to touch an active radiating element. In that situation, a burn could result at the point of contact. This situation is uncommon, but may occur when a small skin surface comes in contact with a radiating element of high voltage.</p>
<p>REVERSIBILITY OF ACUTE AND CHRONIC HEALTH EFFECTS</p>	<p>Thermal (heating) effects are the primary health risk from exposure to RF radiation. Since RFR is nonionizing radiation, the effects of low level exposure are not cumulative. Injuries received from overexposure to RFR will heal via the body's normal healing process. The preponderance of decades of research has shown that low-level RF energy exposure does not cause long-term health effects. RFR cannot cause cell mutation or genetic damage and has not been shown to be carcinogenic.</p>
<p>TREATMENT REQUIRED/AVAILABLE FOR EXPOSURE</p>	<p>Medical Attention/ Medical Treatment for overexposure to RFR is dependent on the exposure level, the exposure duration, and the part of the body that was exposed to RFR. For exposures to RFR that exceed PELs, you should receive an appropriate medical exam and the incident should be investigated and documented. Ocular examination is required if the exposure is greater than 5 times the PEL.</p>
<p>LONG TERM MEDICAL SURVEILLANCE REQUIREMENTS OF HEALTH EFFECTS MONITORING</p>	<p>There are no long-term medical surveillance requirements for individuals who have been exposed to RFR. This is due to the fact that RF is nonionizing radiation and exposure is not cumulative. Pre-placement, intermediate or termination exams are not required for RF workers. Additionally, research has not shown evidence to support existence of low-level long-term effects.</p>
<p>RISK COMMUNICATION ISSUES</p>	<p>If you suspect you have been exposed to RFR levels exceeding permissible exposure limits, contact your radiation safety officer (RSO) or designated unit safety POC. Otherwise, contact your appropriate medical treatment facility (MTF). Although safety programs should be in effect for your specific RF system, incidents can occur due to equipment failure and/or human error. By alerting your safety contacts and medical providers of possible overexposures, investigations can prevent RFR exposure to others.</p>