



DEEOIC - Medical Health Science Unit

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Lesson Objectives

- Describe professional expertise within Medical Health Science Unit
- Provide insights into the work of the DEEOIC Health Physicists and Toxicologists





DEEOIC Professional Experts

- Health Physicist – evaluates occupational radiation exposure and application of the dose reconstruction methodology
- Industrial Hygienist – assesses extent, nature and duration of chemical or biological exposure in an occupational setting
- Toxicologist – analyzes data and literature relating to the relationship between toxic substance exposure and disease
- Registered Nurse – provides medical input on the establishment of medical necessity for requested ancillary medical benefits such as home health care and durable medical equipment



Role and Function of Medical Health Science Experts

- Evaluation of case-specific referrals to offer expert written advice to claims staff responsible for decision making
 - Provide professional input a case adjudicator can “weigh” in comparison to other available case evidence
 - Help direct the course of development
 - Respond to claimant questions or input
 - MHSU experts DO NOT decide the outcome of claims
- Research and analysis of relevant subject matter to support development of program policies and procedure



Health Physicists

- Professional experts in evaluating occupational radiation data in application to DEEOIC claim adjudication process
- Evaluate case-specific referrals to provide consultative advice
 - Reworks of dose reconstructions (DR)
 - Final Adjudication Branch (FAB) technical reviews of DR objections
 - Technical evaluations for reopening requests from Policy units
 - Part E health physics evaluations, including dose estimates for non-cancer diagnoses
- Facilitate engagement with National Institute for Occupational Safety and Health (NIOSH)
 - Special Exposure Cohort (SEC) class designation
 - Program Evaluation Report
 - Program Evaluation Plan
 - Case adjudication assistance



Industrial Hygienists

- Professional experts in assessing the extent and duration of occupational exposure to toxic substances including biological or chemical materials
- Evaluate case-specific situations to characterize exposure to toxic substances in the absence of specific employer-generated monitoring data
 - DEEOIC uses the services of both federal and contractor Industrial Hygienists to profile employee toxic substance exposures
- Industrial hygiene reports are exposure assessments, which describe claimant's exposures at DOE sites in terms of significance. Reports are intended to be as claimant favorable as possible.
 - Significant exposures are described in terms of low, moderate or high and assigned frequencies such as daily, weekly, biweekly, or monthly
 - Incidental exposures refer to exposures that occur in passing only



Toxicologists

- Professional experts in evaluating epidemiological and other scientific data to determine if sufficient scientific basis exists to establish that exposure to a toxin can be found to cause disease
- Conduct research and review published scientific journal articles to determine their applicability to the administration of the DEEOIC
 - Provide analysis and opinion on the establishment of health effects due to occupational exposure
 - Provide analysis and opinion regarding causative thresholds such as latency, routes of exposure, and permissible/acceptable levels of exposure to toxic substances with known health effects
 - Determine if individual claim evidence should be applied broadly as programmatic guidance
- Review case-specific issues when the claimant submits scientific health effect documentation that is not validated by available program resources (e.g., SEM)



Registered Nurses

- Professional expert in the field of skilled nursing including those functions relating to the provision of medically necessary services and equipment needed to manage disease
- Apply knowledge and experience in evaluating medical records to provide Medical Benefit Adjudicators interpretive advice regarding requested ancillary medical benefits
 - Diagnostic test findings
 - Medical terminology
 - Plan of care/letter of medical necessity
 - In-home health care, assisted living, and hospice
 - Auto/home modification
 - Ancillary medical services
 - Durable medical equipment (DME)
 - Medical billing and treatment modalities



DEEOIC – Health Physics and Toxicology Staffing and Organization

- Medical Health Science Unit (MHSU) employs
 - Two full time health physicists
 - One full time PhD Health Scientist (Toxicologist/Epidemiologist)
 - Available contractor Toxicologists
- Organization
 - Members of the National Office Branch of Policy, Regulations & Procedures
 - Health Physicists and Toxicologist report to the MHSU Supervisor



Health Physics – Important Information about Assessing Radiation

- Radiation dose reconstructions apply generous estimates of the amount of radiation encountered by an employee
 - Method used to promote positive outcome
 - Speeds the completion of the dose reconstruction process
- Threshold for compensability is a calculation that occupational radiation was probably 50% or greater reason for diagnosed cancer
- Probability of Causation (POC) calculated at the 99th percentile confidence limit – considered very reliable
- DEEOIC Health Physicists work to ensure the dose reconstruction and probability calculation occur in a consistent manner based on legal and procedural requirements



Health Physics Dose Reconstruction Reworks

- Reworks evaluate the significance of new or changing factual information that may alter the outcome of a prior dose reconstruction or probability of causation calculation
 - Cancer diagnosis
 - ICD-10 coding
 - Diagnosis date
 - Employment issues – facility/work duration
- A validated need for change to a prior dose reconstruction requires a rework
 - Returned to NIOSH to redo the dose reconstruction based on new or corrected information – may not result in a higher probability of cancer being work related



Health Physics Technical Reviews

- Health Physicist Technical Reviews
 - Evaluation of objections and technical arguments involving science of dose reconstruction and estimating the probability that radiation caused a cancer
 - Originate during case adjudication
 - Objections filed in response to decision making
 - Evaluation of data to justify a reopening of previously denied claims
 - Factors or scientific data that a claimant argues changes an estimate of assigned radiation dose or involves an improper calculation of Probability of Causation
- DEEOIC - including its Health Physicists – cannot legally address arguments about the methodology applied during dose reconstruction process or the standard for calculating Probability of Causation



Suggestions from the Health Physics Team

- Respond to development about the extent and duration of occupational radiation exposure including participation in a computer assisted telephone interview (CATI) conducted by NIOSH
- See staff Procedure Manual Chapter 17: Development for Radiogenic Cancer Claims
- Verify the accuracy of factual information communicated in a DEEOIC decision involving occupational radiation assessment
- Report any new information or needed corrections:
 - All primary diagnosed cancers identified
 - Proper cancer diagnosis
 - Accurate cancer date of diagnosis
 - Verified period of employment is complete



Toxicology – Basic Concepts

- Study of the adverse effects of chemical agents on biologic systems
- Toxicologists are concerned with exposure to chemical agents as a cause of both acute and chronic illness
- Occupational Toxicology:
 - Application of the principles and methodology of toxicology toward chemical and biological hazards encountered at work
 - Draws information from the disciplines of occupational medicine, industrial hygiene, regulatory toxicology, and epidemiology
- Epidemiology:
 - Study of the distribution (person, place and time) and determinants of disease/dysfunction in human populations
 - Epidemiologists study the occurrence of disease or other health-related condition in human populations
 - Designs and conducts studies of human populations to determine whether an increased risk of disease can be attributed to an identified exposure.



DEEOIC - Toxicology Reviews

- Performs evaluation of medical health science literature to determine existence of humanistic “health effects”
 - Health effect is the relationship between exposure to a toxic substance and disease
 - Exposure is a cause if - by modification of the exposure - the rate of disease is altered
 - Establishment of a health effect is a determination of the “weight of scientific evidence”
- Written opinion represents an “interpretation” of the weight of scientific evidence based on the Toxicologist’s professional training and judgement
 - Alternative viewpoints may exist and can be submitted for consideration
 - DEEOIC Advisory Board has made recommendations for new health effects



Toxicology – Weighing Scientific Evidence

- Weighing scientific evidence to establish a humanistic health effect requires considering many variables. Epidemiological principles that determine scientific weight:
 - Strength of the Association – statistical calculation (point estimate) between two groups. The higher the calculation – the relationship between exposure and disease may be real
 - Consistency of Results – different studies and in different populations produce same outcomes
 - Temporal Sequence – exposure comes before disease
 - Dose Response Relationship – relationship showing a change in exposure has a corresponding increase or decrease in disease.
 - Biological Plausibility – causal association fits previously existing biological or medical knowledge
 - Epidemiologic Results Supported by Experimental Evidence – deliberate application or withholding of supposed cause to observe effect. This is uncommon in humans because of ethics



Toxicology Guidance

- The Site Exposure Matrix reports humanistic health effect data accepted by DEEOIC


Show DOE sites Show uranium mines Show uranium mills Show Ore-buying stations Show uranium transport

Site:

[Click here](#) to locate a site by alias, description and owner/operator, if you cannot find the site you are looking for in the list above.

SEARCHES OF UNIVERSAL INFORMATION:

Toxic Substances (16627 listed)
[Toxic substance information](#)
[Toxic substance by alias or property](#)
[Toxic substance by chemical category](#)

Health Effects (from Haz-Map Disease List) 
[Disease or health effect information](#)
[Find toxic substance by disease or health effect alias](#)
[Disease or health effect by alias](#)

Work Processes with embedded disease links (93 listed)
[Work Process information](#)
[Work Process by work process text](#)

- Establishing human health effects requires many studies, consistent results and reliable data to assign scientific weight
- Correlation studies report statistically interesting data but do not weigh the significance of identified associative findings. An increase in disease in a specific worker population does not mean a shared exposure to a specific toxin is a definitive causal factor



Submitting Health Effect Data for Consideration

- Use the SEM Portal for submitting disease-related information
www.sem.dol.gov
- For case specific submissions – provide the complete copy of the medical health science literature that supports a contention that exposure to a toxin causes a claimed, diagnosed disease
- Ensure the medical health science literature speaks to the disease in question and relates to toxins for which exposure at an atomic weapon site potentially occurred
- Medical opinions of aggravation or contribution are dependent solely on the interpretation of the available medical health science evidence by the physician making such an opinion.
- Review Chapter 15 of the DEEOIC Procedure Manual for more information on the Toxicology review process.



Questions



Questions can also be submitted to DEEOIC-Outreach@dol.gov

Thank you very much for attending the DEEOIC Webinar