

ABSTRACT Internal Dosimetry Intercomparison Program

Cheryl Antonio

There are numerous intercomparison programs available for laboratories to test their capabilities for detecting and quantifying various radionuclides in bioassay samples. Though measurement results are important, what is of greater value is how those results are interpreted and used to calculate an intake and the resulting dose. In 2020, an internal dosimetry intercomparison program was initiated to allow internal dosimetry programs an opportunity to see how their methodologies for calculating intakes and doses compare with other programs. The intercomparison program was intended to showcase how dosimetry programs utilize available bioassay data, models, and software to achieve a final dose assessment.

Two cases were developed, one involving inhalation of a plutonium mixture and the other involving inhalation of a uranium mixture. Participation was individually or as an organization/department. The intercomparison exercise was open to all who wished to participate and was initially announced at the Radiobioassay and Radiochemical Measurements Conference (RRMC) in 2019 in Santa Fe, NM. Thirty-three participants expressed interest and of those 14 submitted dose evaluations for Case A - plutonium mixture and 11 submitted dose evaluations for Case B – uranium mixture. All data was normalized to the year 2020 and the locations or work scope was not identified.

The plutonium case was based on an actual accident. The event summary mirrored the actual event and the bioassay results were actual sample results. There were several specific aims to this case, firstly evaluating a case based on bioassay data that included lung counts, urine and fecal results. Similarly to the plutonium case, the uranium case mirrored an actual event. There were several specific aims to this case, firstly evaluating a case with potential for varying absorption types and particle sizes.

An evaluation report of each case will be presented showing a compilation of the results and methods used by the participants for both the plutonium and uranium cases. In addition, each case will be evaluated using the guidance “Technical Recommendations for Monitoring Individuals for Occupational Intakes of Radionuclides” (TECHREC 2014), which was coordinated by the scientific society European Radiation Dosimetry Group (EURADOS) as a tool for internal dosimetrist. Workshop attendees who participated in 2020 intercomparison will have an opportunity to present their results and methodology. The workshop will be an open forum for discussion. The 2022 Internal Dosimetry Intercomparison will kick off with discussion of two new cases, one based on a Co-60 inhalation and the other on a plutonium wound with no medical intervention.