

## NSRT Conference – 2019

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### **Title: The Life Span Study (LSS) & Medical Radiation Risk**

This lecture provides both an historical perspective and a current update on the Life Span Study (LSS) of World War II atomic bomb survivors of Japan. The relationship and applicability of this cohort study data to risk estimates for medical radiation exposure will be outlined. The controversies regarding the appropriateness of comparisons between LSS data and medical imaging procedure risk will be discussed. Future directions for accurate medical radiation dose risk models will also be reviewed.

### **Objectives**

Upon completion of this session the attendee will be able to:

1. Recall historical details of the atomic detonations over the Japanese cities of Hiroshima and Nagasaki in 1945.
2. Explain how the scientific community responded to the humanitarian crisis that followed the end of WW II in Japan.
3. Describe the genesis of the Life Span Study (LSS) and the ongoing data collection to date.
4. Relate the data collected from the LSS to the development of the linear non-threshold response model.
5. Understand and apply the concept of Number Needed to Harm (NNH) in a manner that provides empirical context to estimates of risk from medical radiation exposure.
6. Compare and contrast the supporting and critical viewpoints regarding the appropriateness of medical radiation risk estimations from LSS data.

### **Outline**

- A. Japan – August, 1945
  - 1) Immediate impact
  - 2) Acute radiation syndrome (ARS)
  - 3) Global emergency response
- B. Life Span Study (LSS)
  - 1) Cohort study research
  - 2) LSS findings & reports
- C. LSS and Medical Radiation Risk
  - 1) Linear Non-Threshold (LNT) Model
  - 2) LSS data comparisons with radiologic procedures
  - 3) Calculating risk: Number Needed to Harm (NNH)
- D. Critical Assessment of LSS Comparisons
  - 1) LSS data to the LNT model
  - 2) Radiation Hormesis
- E. Future Considerations
  - 1) Additional medical radiation risk studies