BEIR VII: What it does and doesn’t say
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Abstract

Background: Over the last 2 years, there has been considerable attention focused on the potential cancer risks from medical imaging procedures, particularly with the widespread use of multislice CT. Almost all studies rely upon the BEIR VII report (Biological Effects of Ionizing Radiation panel formed under the auspices of the National Academy of Sciences) to generate an estimate of the risk of cancer from a given procedure. In doing so, most studies treat the BEIR VII report as a solid basis of scientific evidence for estimation of cancer risk. In reality, a close reading of this report shows that there are a large number of assumptions inherent in all aspects of the estimates of cancer risk – a fact that is often and clearly stated in the report.

This presentation will review some of the assumptions used by the BEIR panel to calculate cancer risk, including the impact of different models (excess absolute risk vs. excess relative risk), the dose and dose rate effectiveness factor (DDREF) and relative biological effectiveness (RBE), on cancer estimates.

Often lost in the discussion on medical exposure is a reference level by which exposure levels can be compared to something that unavoidable and impacts everyone on earth – background radiation. This presentation will review the consequences of applying the BEIR model to background radiation and known variations in levels of background radiation throughout the U.S., and how the cancer rate from background compares with that from medical imaging.

Learning Objectives
1. Understand the assumptions underlying the BEIR VII report
2. Be able to compare the relative risks of medical imaging procedures to that from background radiation