Ionization chambers have been used in medicine for nearly a century. They are the standard instrument for measuring exposure and its related quantity, air kerma. In diagnostic medicine, there is a wide range of conditions under which air kerma must be measured. Air kerma rates important to diagnostic and image-guided interventional radiology vary from less than 10 microgray per hour to many gray per minute. Energies range from less than 10 keV to 150 keV. Photon directivity can be nearly unidirectional, isotropic, or anisotropic. The manufacture of a variety of ionization chambers is necessary to meet the challenges of various tasks. This presentation will discuss the various forms of ionization chambers and their limitations and versatility for use in diagnostic medicine.

Learning objectives:

1. To understand limitations in the use of air-kerma ionization meters
2. To be able to select the proper meter for a given task
3. To understand how different tasks place different challenges on the measurement of air kerma