AbstractID: 2564 Title: Recent developments in CT technology

The first lecture in the symposium "The New CT" will cover recent developments in hardware. This relates to the scanner mechanics, the x-ray source, and the detector system, but also to new designs such as C-arm and micro-CT systems. The largest portion will be dedicated to detector concepts and characteristics.
With rotation times below 0.5 s, modern clinical CT systems pose increasing demands on the mechanical design of the scanner and of all its components. These are contrasted by the demands of C-arm systems using flat panel detector where rotation times are typically between 5 and 20 s.
Due to the increased rotation speed in clinical CT, x-ray power levels increase accordingly to allow for unimpaired image quality, in particular unaltered noise levels. The latest developments in x-ray source technology, which offer power levels of 80 to 100 kW, will be reviewed and explained.
CT detector technology has received remarkable interest in the past years. The continuous development from single-slice to multi-slice systems, including detectors allowing the simultaneous acquisition of 2, 4, 6, 8, 10, 12, 16, 32, 40, and 64 slices, has even been viewed as the "slice race" or the "slice war" in the media. The technological basis will be reviewed. In particular, the question if this development shall and will continue will be discussed. This also includes the potential role of flat panel detectors which have come into use with C-arm systems and which are now being used frequently for interventional CT and for CT angiography.
The presentation will conclude with a short review of dose management and micro-CT systems.

Conflict of Interest (only if applicable):
WAK is a consultant to Siemens Medical Solutions.

Educational Objectives:
1. to understand the detector concepts presently in use in clinical CT
2. to understand the distinction between multi-row detectors and multi-slice scanning
3. to understand the concepts and requirements for exposure control systems