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### Digital vs. Computed Radiography

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The ongoing contest between digital radiography and computed radiography for first place in the digital imaging market continues to throw up new issues. Although both CR and DR improve workflow and productivity when compared to their non-digital predecessor, both have their own specific advantages and disadvantages and the main factor in choosing one system over another seems to come down to cost. Here we present a snapshot of some of the key pros and cons when choosing which system to implement, affecting areas such as productivity, cost-effectiveness, image quality and technologist productivity. Are the initial cost-savings of choosing CR over DR sensible when looking at a long-term productivity model? Is it even feasible for medical facilities, who suffer increasingly tight budgets and lower levels of public financing, as well as staff shortages and an exponential increase in the number of imaging procedures carried out, to consider investing in DR? Here we take a brief look at the main issues.

#### Computed Radiography

- CR has significantly lower start-up costs than DR, because of the potential for radiography rooms to adapt their existing system more easily, by replacing the traditional film cassette with a CR cassette.
- Although DR is generally accepted to be the speedier technology, in fact reducing the number of steps in the CR workflow process could reap similar benefits. Cassette handling is still a productivity issue in CR but there are emerging technologies that may challenge DR in this aspect.
- Despite initial cost savings in choosing a CR system over DR particularly when considering start-up cost, higher overheads in terms of investment in maintenance and staff productivity must be taken into account. Because a CR system necessitates workflow steps such as taking the cassette to the reader, medical facilities with a higher throughput may find that long-term, a DR system leads to higher cost-effectiveness

#### Digital Radiography

Current research confirms that DR is significantly faster and more efficient than CR. A typical CR exam can take up to three times the average time taken by a DR exam. Service providers such as Canon have led scientific studies that prove that a DR chest-examination in two directions, using DICOM modality WorkList can be done in 100 seconds, compared to 300 seconds with film screen technology. This saving in terms of time is directly related to reduction in the number of post-processing workflow steps, rather than time taken in acquiring the image. While a DR preview appears within moments, a CR image can be judged in 90 seconds.

- DR not only incurs a prohibitively higher start-up cost than CR, it also requires some level of costly maintenance, and users must take into account factors such as the eventual replacement cost for DR detectors. However, detectors can last on average more than six years, with an estimated economic life cycle of around twelve years, so the associated risk of detector failure is relatively low. Also, many service providers offer to cover this risk with an insurance of a percentage per order per year that is well accepted in the market place.
- DR is considered to be speedier in producing a readable image, as images are sent straight to the PACS system. Not only this, but DR systems produce better quality diagnostic images.
- As DR emerges, there is an early emphasis being placed on this technology as a complete system, as it has the potential for room add-ons. Direct DICOM output associated with DR goes some way in addressing productivity issues.
- Hospitals are slower to choose DR systems, partly because of price and partly because the equipment's size and relative immobility limits its use. In practice, hospitals tend to use a mix of devices so DICOM-standard software must be able to handle images from multiple sources.

#### Conclusion

Although many agree that DR is the 'wave of the future', it can be prohibitively expensive. However, there is reluctance in imaging departments

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to invest in CR, knowing that in the future they may have to convert to DR. One argument sees DR as becoming the standard of the future, as it eliminates the need for film storage space, speeding delivery of images. Whether used on its own or as part of a mix of technologies, many healthcare facilities are deciding that initial high outlay in choosing DR over CR is worth it. Dr Eddy Van Hedent, Head of Radiology at the ASZ Community Hospital in Aalst, Belgium, has recently completely digitised the department, except for mammography. His move to CR was mainly inspired by the need to optimise workflow of medical staff, and to cope with the approximately 250 patients per day who are examined in the department. Says Van Hedent; 'Technology is changing at a rapid rate. We need to take into account that this will also affect the growth of CR, which I believe will become obsolete in the future, only maintained for bedside Rx in intensive care units where patients can not be moved to imaging departments or centres. However, in the long run, bedside DR will also no doubt become a possibility. Once DR becomes less expensive, I too will consider taking the next step in implementing this technology.'

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