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What is the most significant advancement in medical imaging in the last 10 years?

Transitioning from bulky, stationary, traditional analog film systems to smart, digital mobile radiography has significantly advanced the medical imaging field in the last decade. The movement towards fully mobile compact systems allowing easy transport have added a component of versatility into a previously inflexible environment. Allowing access to various healthcare settings outside of the rigid constraints of the imaging room. From remote rural areas, ambulatory units, community nursing homes, doctor's surgeries and even private homes (1) (2). Additionally, the ability for a radiographer to expedite imaging in crucial periods through direct access to the bedside of limited mobility patients in areas such as intensive care units.

The last decade, in particular, has showcased numerous instances where such technological advancements have proved pivotal in managing widespread health emergencies by providing accessible and rapid diagnostics. Mobile diagnostics proved especially poignant in the context of the recent global health crises (COVID-19), where good practice minimizing physical interactions without compromising on healthcare delivery became imperative and had a vital effect on mortality rates in the critically ill (3) (4). Mobile machines enabled easy control of infection, resources, and workflow during chest radiography (5).

Advances aren't merely limited to the acquired portability of machinery. The introduction of portable systems such as the O-arm Surgical System is one example of advancement of mobile imaging within an area such as theatre radiography. Imaging is a vital component in the entire process of patient orthopaedic procedures to monitor both progress and complication risks (6).

The ability to provide real time 2D and 3D high resolution intraoperative imaging versus traditional fluoroscopy is a valuable tool in ensuring completion of precise and accurate surgical procedure (7) (8) (9). Enhanced visualisation of the surgical field in multiple planes and angles aids surgeons in interventional decision making for aspects such as mal-positioning of screws while the patient is still presently on the operative table (10). Thus, minimising postoperative complications with minimum discomfort to the patient. Additional benefits of this reduction of revision surgery include improved patient outcomes, quicker and more efficient surgical workflows and reducing overall procedure time and operating room turnover; all with minimal change in radiation exposure (7).

The transition to digital mobile radiography is not without its challenges. There is the additional burden of financing acquisition and maintenance of mobile equipment in addition to standard imaging rooms (2). Issues related to data security become more evident. Staff require continuous professional development to keep abreast with rapid technological advancements.

In conclusion, the shift from traditional analog film systems in stationary rooms to digital mobile radiography over the last decade highlights more than just an advancement in diagnostic capabilities. It signals a future where technology and healthcare merge to offer enhanced, accessible, and precise patient-centred care. With ongoing innovations and the integration of smarter technologies, the field of medical imaging is set to be continually redefined. Additionally, these advancements are now manufactured in equipment so portable that a single healthcare professional can easily manoeuvre them.

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