Improving Efficiency in Trauma Patients: Preventing repeated imaging, radiation exposure, and increasing practitioner satisfaction.

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Background & Purpose:
Efficiency in patient care is the backbone for patient safety. Maintaining optimal care in the trauma population can test efficient practices through the need for transfer from local emergency departments and trauma centers to level I trauma centers. Variations in imaging programs utilized may prevent interface of images at the receiving trauma center. Life Image, image acquisition software, serves as an interface allowing for the importing and viewing of images obtained outside of the facility. This program may reduce repeat imaging of transferred patients and improved efficiency of care. A collaborative effort between the surgical, radiology, and nursing departments evaluated this process.

Study/Project Design:
A retrospective, uncontrolled design was utilized. Pre and post transfer images and repeated exams were compared.

Setting:
This occurred in an intake area of a 98 bed, trauma center, receiving over 8,000 patients a year, one-third in transfer.

Sample:
Total sample size was 1950 patients; 971 and 979 in the Pre and Post Life Image group, respectively. Additionally, 15 physicians were surveyed on the process; 9 responded.

Procedures:
Life Image use began in October 2011. All patients transferred between January 1, 2011 and June 30, 2011 were reviewed as “Pre Life Image” patients and all patients transferred between January 1, 2012 and June 30, 2012 were reviewed as “Post Life Image” patients. The total number of completed radiology tests pre and post transfer were tracked and the total number of repeat exams pre and post Life Image were compared. Twelve radiology tests were considered, including 8 CT scans and 4 X-Rays. Radiation exposure was estimated in millisievert (msv) per exam as provided by the Health Physics Society. A comparison of the total msv’s of exposure from repeated exams pre and post Life Image were compared. Admitting physicians with an understanding of both image acquisition processes received a 6 item survey comparing both processes evaluating efficiency, perceived re-imaging, satisfaction, and resource allocation.

Findings/Results:
Prior to Life Image, 62% of transferred patients underwent repeat radiology tests, and after implementation, 47% underwent repeat tests (z = 6.65, p<.01). The mean total radiation exposure pre and post Life Image was 25.8 and 24.7 msv, respectively (ns). However the mean radiation exposure due to repeated tests pre and post Life Image was 5.3 and 3.7 msv, respectively, which was statistically significant (p < .001). Physician surveys indicated that all 9 respondents perceived that LifeImage increased efficiency and allowed for fewer repeated imaging studies.

Discussion/Conclusions/Implications:
After implementation of Life Image, patients transferred to our trauma center underwent 24% fewer repeat radiology tests. In addition, radiation exposure was significantly less. These findings support the conclusion that Life Image contributes to the efficiency of operations. Further analysis of patient subgroups is needed in order to evaluate the use of repeated imaging for clinically indicated reasons, such as alterations in status or ongoing evaluation of injuries. Practitioner satisfaction has promoted outreach to regional trauma centers and emergency departments with additional pilot programs of image transfer.