Use of Diagnostic Imaging Studies and Associated Radiation Exposure for Patients Enrolled in Large Integrated Health Care Systems, 1996-2010

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Context. Use of diagnostic imaging has increased significantly within fee-for-service models of care. Little is known about patterns of imaging among members of integrated health care systems.

Objective. To estimate trends in imaging utilization and associated radiation exposure among members of integrated health care systems.

Design, Setting, and Participants. Retrospective analysis of electronic records of members of 6 large integrated health systems from different regions of the United States. Review of medical records allowed direct estimation of radiation exposure from selected tests. Between 1 million and 2 million member-patients were included each year from 1996 to 2010.

Main Outcome Measure. Advanced diagnostic imaging rates and cumulative annual radiation exposure from medical imaging.

Results. During the 15-year study period, enrollees underwent a total of 30.9 million imaging examinations (25.8 million person-years), reflecting 1.18 tests (95% CI, 1.17-1.19) per person per year, of which 35% were for advanced diagnostic imaging (computed tomography [CT], magnetic resonance imaging [MRI], nuclear medicine, and ultrasound). Use of advanced diagnostic imaging increased from 1996 to 2010; CT examinations increased from 52 per 1000 enrollees in 1996 to 149 per 1000 in 2010, 7.8% annual increase (95% CI, 5.8%-9.8%); MRI use increased from 17 to 65 per 1000 enrollees, 10% annual growth (95% CI, 3.3%-16.5%); and ultrasound rates increased from 134 to 230 per 1000 enrollees, 3.9% annual growth (95% CI, 3.0%-4.9%). Although nuclear medicine use decreased from 32 to 21 per 1000 enrollees, 3% annual decline (95% CI, 7.7% decline to 1.3% increase), PET imaging rates increased after 2004 from 0.24 to 3.6 per 1000 enrollees, 57% annual growth. Although imaging use increased within all health systems, the adoption of different modalities for anatomic area assessment varied. Increased use of CT between 1996 and 2010 resulted in increased radiation exposure for enrollees, with a doubling in the mean per capita effective dose (1.2 mSv vs 2.3 mSv) and the proportion of enrollees who received high (>20-50 mSv) exposure (1.2% vs 2.5%) and very high (>50 mSv) annual radiation exposure (0.6% vs 1.4%). By 2010, 6.8% of enrollees who underwent imaging received high annual radiation exposure (>20-50 mSv) and 3.9% received very high annual exposure (>50 mSv).

Conclusion. Within integrated health care systems, there was a large increase in the rate of advanced diagnostic imaging and associated radiation exposure between 1996 and 2010.

A Framework Convention on Global Health: Health for All, Justice for All

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Health inequalities represent perhaps the most consequential global health challenge and yet they persist despite increased funding and innovative programs. The United Nations is revising the Millennium Development Goals (MDGs) that will shape the world for many years to come. What would a transformative post-MDG framework for global health justice look like? A global coalition of civil society and academics—the Joint Action and Learning Initiative on National and Global Responsibilities for Health (JALI)—has formed an international campaign to advocate for a Framework Convention on Global Health (FCGH). Recently endorsed by the UN Secretary-General, the FCGH would reimagine global governance for health, offering a new post-MDG vision. This Special Communication describes the key modalities of an FCGH to illustrate how it would improve health and reduce inequalities. The modalities would include defining national responsibilities for the population's health; defining international responsibilities for reliable, sustainable funding; setting global health priorities; coordinating fragmented activities; reshaping global governance for health; and providing strong global health leadership through the World Health Organization.

Measurement Characteristics of the Pediatric Asthma Health Outcome Measure

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Introduction. The Pediatric Asthma Health Outcome Measure (PAHOM) was designed to measure quality-adjusted life years (QALYs) in children with asthma. Our objective was to compare parent- and child-reported PAHOM scores to each other, to parent-reported scores on the Juniper Asthma Control Questionnaire (ACQ), and to physician-rated asthma control.

Methods. A convenience sample of primarily African-American parent-child dyads (N = 261) was recruited from asthma clinics between May 2008 and May 2010. Correlations and differences in scores between the instruments and respondents were compared across variables of interest. The sensitivity and specificity of each, relative to physician-rated asthma control, were estimated.

Results. Mean (SD) parent- and child-reported PAHOM scores were significantly different, 0.91 (0.13) and 0.95 (0.08), respectively, (p < .01) and were weakly correlated (0.24). Parent-reported PAHOM and parent-reported ACQ, 5-item version (ACQ5) scores were moderately correlated (-0.69). Both the parent- and child-reported PAHOM scores distinguished between physician-rated well-controlled and not well-controlled asthma (p < .01 and p < .01, respectively). When compared with physician-rated asthma control, the areas under the receiver operating characteristic (ROC) curves for the parent-reported PAHOM and the ACQ5 were similar (p = .11), but both performed better than the child-reported PAHOM (both p < .01).

Discussion. The validity of the PAHOM is supported by its moderate correlation with the ACQ and its association with physician-rated asthma control. Although intended to be administered to children, parent-reported scores were better predictors of physician-rated asthma control.

Conclusions. A validation study in a more economically and ethnically diverse population is needed. Until then, we recommend the PAHOM to be administered to both parents and children.

Lung Sound Analysis in a Patient with Vocal Cord Dysfunction and Bronchial Asthma

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Objective. Vocal cord dysfunction (VCD) is a condition characterized by adduction of the vocal cords, resulting in narrowing or even closure of the glottis during inspiration. This can cause wheezing that originates at the site of narrowing. Some patients have both VCD and asthma. In such cases, an acute episode of VCD can be difficult to differentiate from that of asthma. We tested the usefulness of lung sound analysis (LSA) in such a condition.

Methods. We performed an LSA in a patient with asthma and coexisting VCD diagnosed using laryngoscopy.

Results and Conclusion. The LSA during an acute VCD episode revealed monophonic continuous adventitious sounds that were distributed symmetrically over both lung fields. The time domain analysis revealed that the adventitious sounds originated in the neck. These LSA findings clearly indicated that the acute episode was not due to asthma but due to VCD. This case illustrates that the LSA may be a useful tool to differentiate between an acute episode of asthma and that of VCD.