

CHARACTERIZATION OF HIGH LEVELS OF RADIATION EXPOSURE IN A LARGE VOLUME PEDIATRIC CARDIAC CATHETERIZATION LAB

i2 Poster Contributions

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Background: We sought to characterize radiation exposure during pediatric cardiac catheterization and to assess changes in radiation exposure after the introduction of a radiation threshold monitoring and notification policy.

Methods: Radiation dose data were reviewed on all cases since 7/1/05 at a single large pediatric center. To create cases with similar expected dose profiles, procedures were classified according to 20 common case types. Case types were then subdivided into 5 age categories. Groups with <20 cases were excluded from further analysis. Radiation exposure was quantified by dose (mGy) and reported as median and IQR. For diagnostic cases we examined radiation dose by physician and differences in radiation dose before and after implementation of a radiation monitoring and notification policy.

Results: Between 7/1/05 and 12/10/08, 3,365 cases were classified in one of 20 case groups and 411 excluded due to insufficient numbers in the group. Radiation exposure varied by age and procedure type, as illustrated by the following examples. Infants undergoing catheterization prior to a bidirectional Glenn procedure (n=128) had a median radiation dose of 412 mGy. A similar dose (464 mGy) was used for children 1-4 yrs of age prior to a Fontan operation (n=128). The highest radiation doses among children 10-15 yrs of age were in patients undergoing 2 or more pulmonary angioplasty interventions (n=37: 3612 mGy [2211, 6206]). Children 1-4 yrs of age undergoing ASD closure received a median dose of 540 mGy [361, 753] in contrast to 1403 mGy [983, 2225] in adolescents and adults over 16 yrs. The median dose for children <1 yr of age undergoing diagnostic catheterization (n=236) by 5 different interventional cardiologists ranged from 204 mGy [150, 434] to 300 mGy [173, 593]. Overall, there was a decrease in radiation exposure after policy implementation, from 254 to 144 mGy (p<0.001). A similar decrease was noted for patients < 1 yr of age but not for older age groups.

Conclusion: Radiation exposure in pediatric patients with congenital heart disease undergoing catheterization varies by age and procedure type. A radiation monitoring and notification policy may have contributed to reduced radiation exposure.