Improved Clinical Decision Making through Standardized Capture and Analysis of Imaging data

Sujaya H. Rao MS, Mohamed Elbanan MD, RK Iyer, MS, Riya Nellippallil, MSN, Kevin Mulpur, MHA, Brett Carter, MD, Priya Bhosale, MD, Habib Tannir, MS, Wei Yang, MD, David Piwnica-Worms, MD, PhD, Edward Suh, DSc, Marshall E. Hicks, MD (University of Texas MD Anderson Cancer Center – Houston – TX – USA)

BACKGROUND: MD Anderson Cancer Center (MD Anderson) lacked a platform to extract imaging related analytics from diagnostic images to identify imaging biomarkers. Assessment of demand indicated that almost 60% of the clinical research protocols did not involve any collaboration from Division of Diagnostic Imaging (DI). The few protocols which did have collaborators from DI had no standardized or automated structure in place to facilitate this collaboration. DI started the Quantitative Imaging Analysis Core (QIAC) initiative to provide standardized and reproducible imaging metrics across the institution. QIAC will provide tumor metrics, volumetrics and advanced imaging analyses to help identify radiomics biomarkers (unique quantitative or qualitative features --- size of lesion, volumetric, etc.) to correlate with other proteomic biomarkers (serum based.--- CEA, PSA, etc.) and genomic biomarkers (genes --- BRCA1, BRCA2, etc.) within the oncological therapeutic pipeline.

AIM: The aim was to provide a structured standardized tool for reporting tumor measurements with a 25% reduction in turnaround time from November 2014 thru February 2015 baseline data.

METHODS: Six Sigma's DMAIC and DFSS methodologies were used to develop the standardized reporting tool. The metric "Turnaround time from scan to finalized results" was used to show if process had improved after implementing QIAC. The data for the period March 2015 thru August 2015 indicated that the treating physicians had access to patients' metrics within 13 hours of routine scans, a 35% reduction in turnaround time for reporting tumor metrics.

RESULTS: Major outcomes include a strong collaboration among DI stakeholders, Research IS & Technology Services, and treating physicians across MD Anderson with a reduction in the turnaround time of tumor metrics report by 35%. Currently, nine (9) clinical departments within MD Anderson are actively using QIAC. This number is expected to double in the coming year. Tumor measurement data incorporated within the patient's medical record has resulted in improved clinical decision making, economical storage of QIAC data in an institutional server, retrieval, and backup for future research projects.