



RISK REDUCTION INITIATIVE IN THE CONGENITAL CATHETERIZATION LAB

The Boston Experience & C3PO-QI

Lisa Bergersen MD MPH
Boston Children's Hospital
Associate Professor Harvard Medical School



DISCLOSURE



Consultant for 480 Biomedical Inc.

THE BOSTON HEART CENTER EXPERIENCE







The Boston Children's Hospital experience is enmeshed with C3PO-Q1



*Data collection for QI initiative began in 2014 at 15 participating sites

Goals

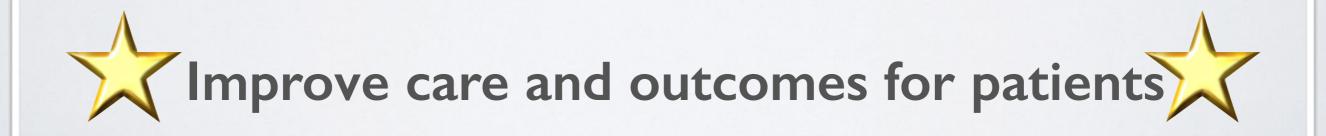
*Reduce radiation exposure at BCH & participating sites





RISK REDUCTION PROJECT

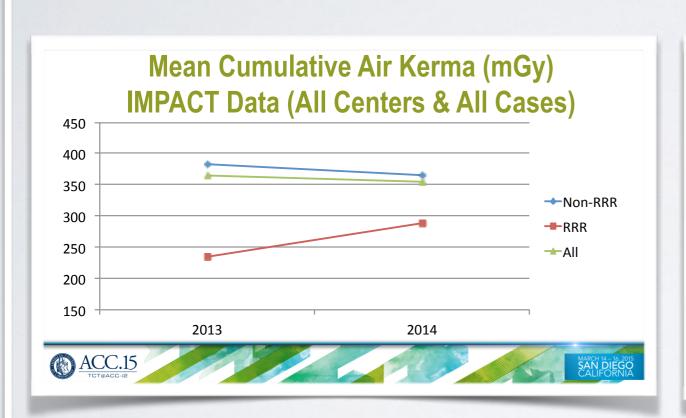
- * Record data on all procedures
- * Measure outcomes & identify differences
- * Conduct collaborative QI initiative

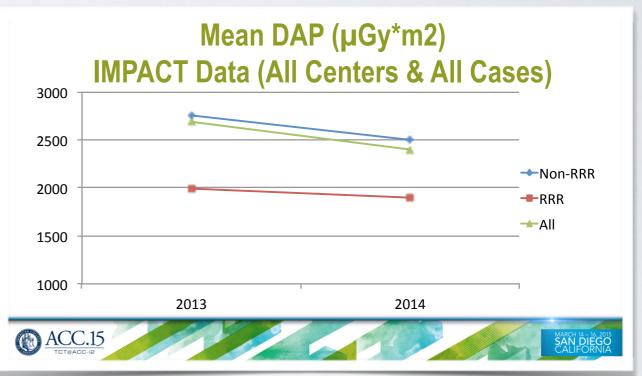


IMPACT IMPROVING PEDIATRIC AND ADULT CONGENITAL TREATMENT

Launched in 2010

90 Participating hospitals and 60,000 + procedures



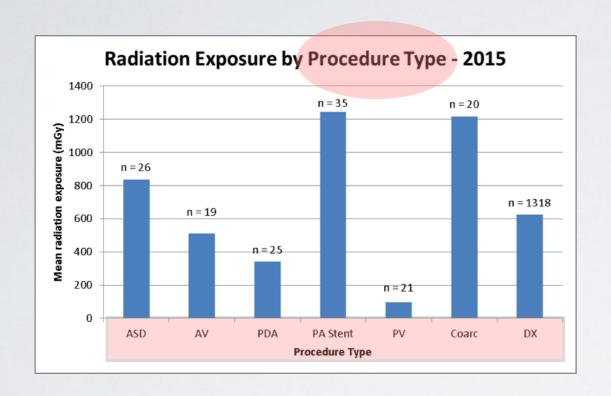


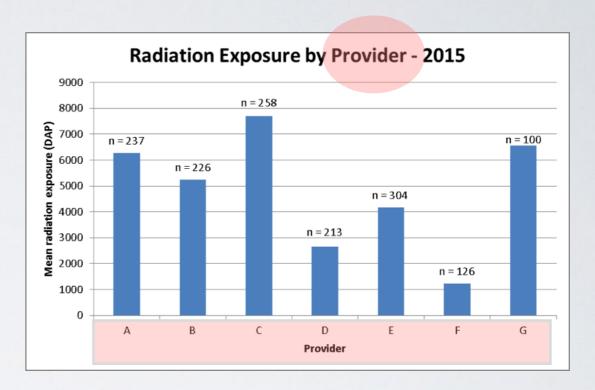
Goal: Reduce radiation exposure by 25% in 1 year & cultivate a culture of quality improvement in congenital catheterization programs

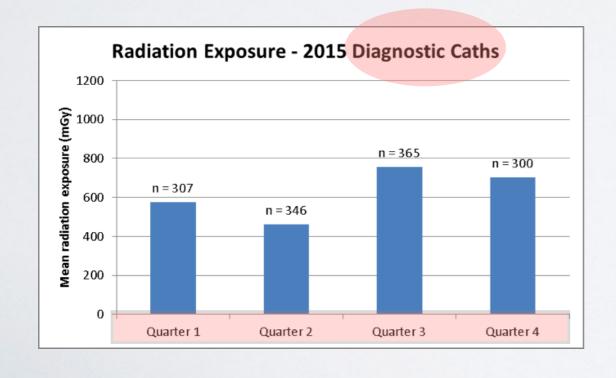
IMPACT - BOSTON HEART CENTER

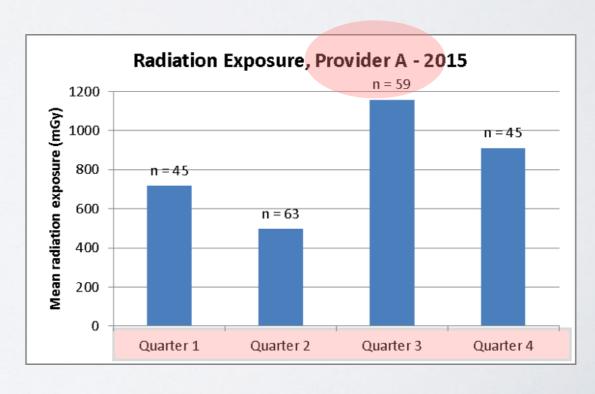
* We generate institutional reports at BCH based on quarterly data received from the NCDR-IMPACT registry

IMPACT - BOSTON HEART CENTER









IMPACT - BOSTON HEART CENTER

* Overall summaries are provided by IMPACT, however radiation outcomes are not reported stratified by age or weight to allow case mix adjustment of the radiation outcome

C3PO-QI Congenital Cardiac Catheterization Outcomes Project - Quality Improvement

What tools do we utilize for measurement & reporting?

C3PO-QI Website

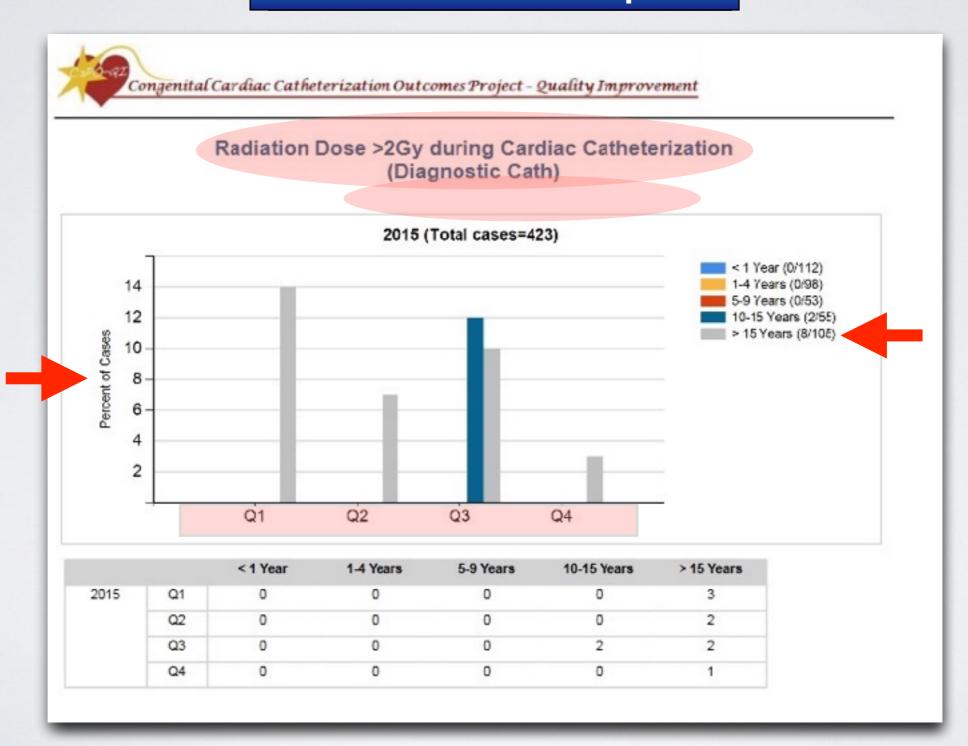
- ★ Procedure specific outcomes based on ACC Quality Metric
- ★ Comparative site to C3PO-QI aggregated data
- ★ Site threshold dose reports

Tableau Data Review

★ Bi-monthly webinars with C3PO collaborative and BCH site conference at division M&M using customized Tableau dashboards which allow real-time manipulation of dataset

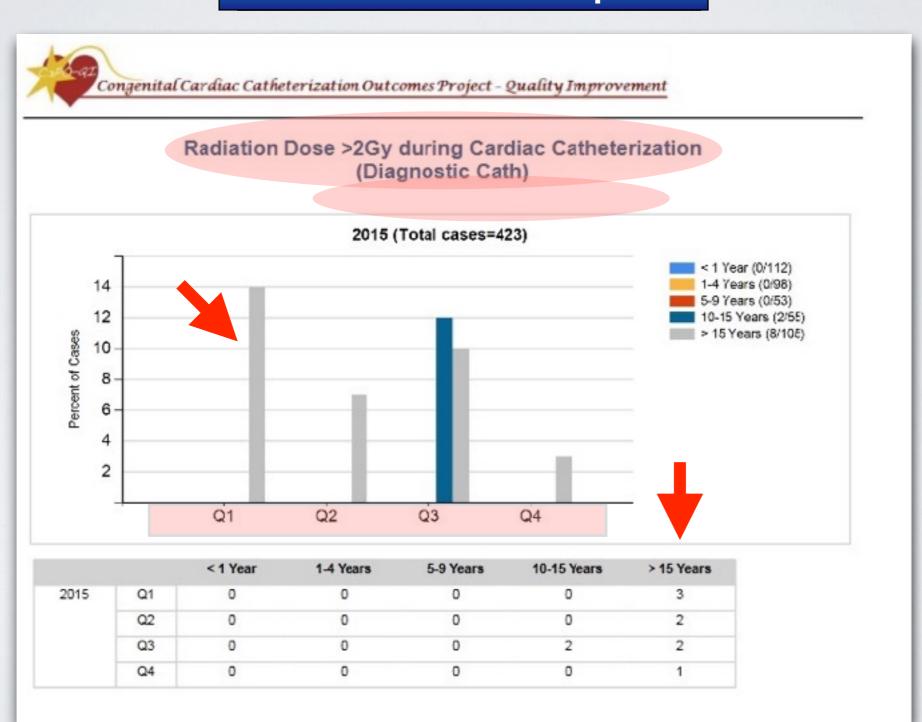
C3PO-QI ONLINE REPORTING

Threshold Dose Report



C3PO-QI ONLINE REPORTING

Threshold Dose Report

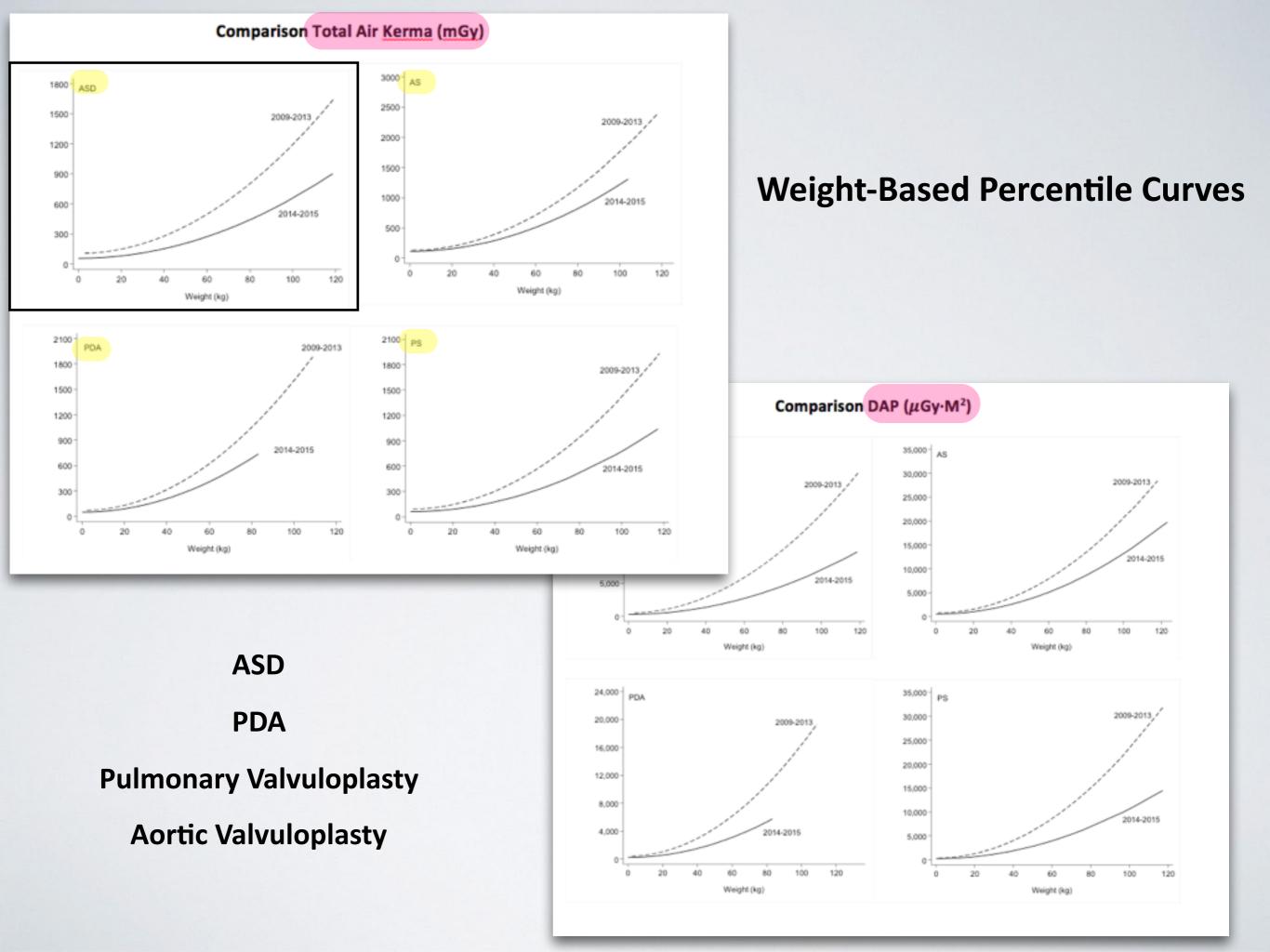


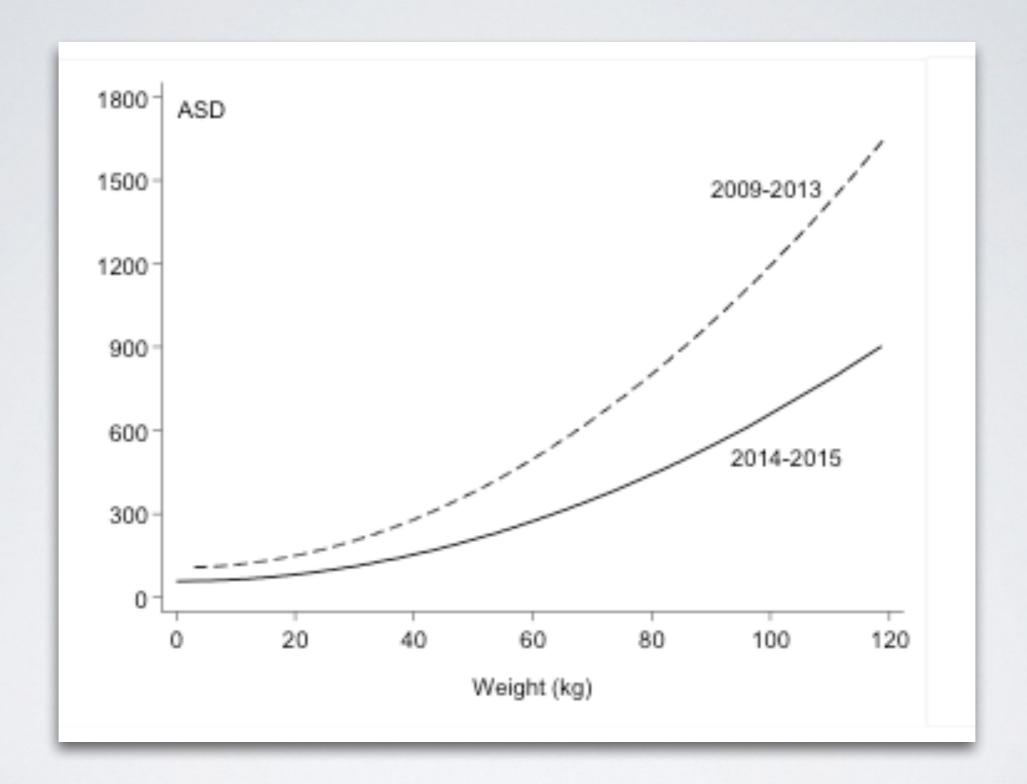
Radiation Dose Benchmarks used for Quality Metric

- *Started with radiation dose benchmarks collected from retrospective experience at centers (Ghelani et al JACC Interventions 2014)
- *New radiation dose benchmarks have been established based on prospective data entry in C3PO-QI between 2014 to 2015

Radiation doses compared to previous benchmarks decreased

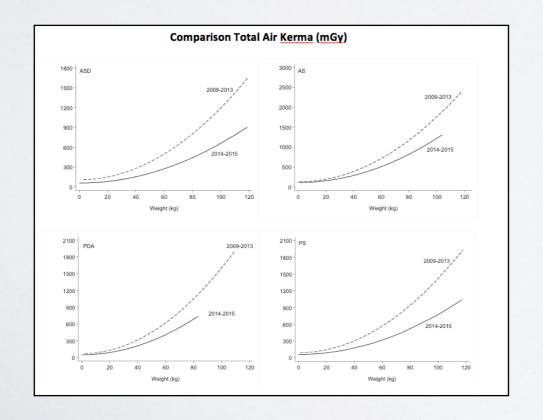
			Total Air Kerma, mGy				Dose Area Product, μGy⋅M²				Total Fluoroscopy Time, min			
Procedure	Total No.	N	Median	75 th Percentile	95 th Percentile	N	Median	75 th Percentile	95 th Percentile	N	Median	75 th Percentile	95 th Percentile	
ASD	[731, 307]	[532, 294]	-134	-321	-837	[726,296]	-1358	-4469	-19546	[726, 276]	-1	-1	+9	
AV	[297, 140]	[238, 139]	-42	-172	+239	[296, 137]	-475	-2623	-3177	[296, 127]	+2	+6	+17	
COA	[452, 299]	[360, 292]	-98	-344	-1586	[448, 289]	-1563	-5860	-19732	[452, 268]	+1	+1	+2	
PDA	[548, 463]	[362, 444]	-36	-40	-258	[547, 445]	-338	-792	-5955	[544, 384]	+1	+3	+9	
PV	[462, 267]	[362, 261]	-45	-103	-355	[461, 259]	-356	-1012	-8132	[461, 233]	-2	0	0	
TPV	[223, 204]	[200, 200]	-836	-827	-184	[223, 199]	-9492	-12684	-22451	[223, 195]	-12	-14	-14	

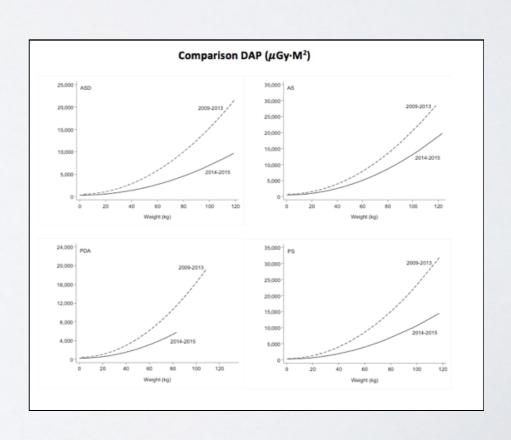




Radiation Dose Benchmarks used for Quality Metric

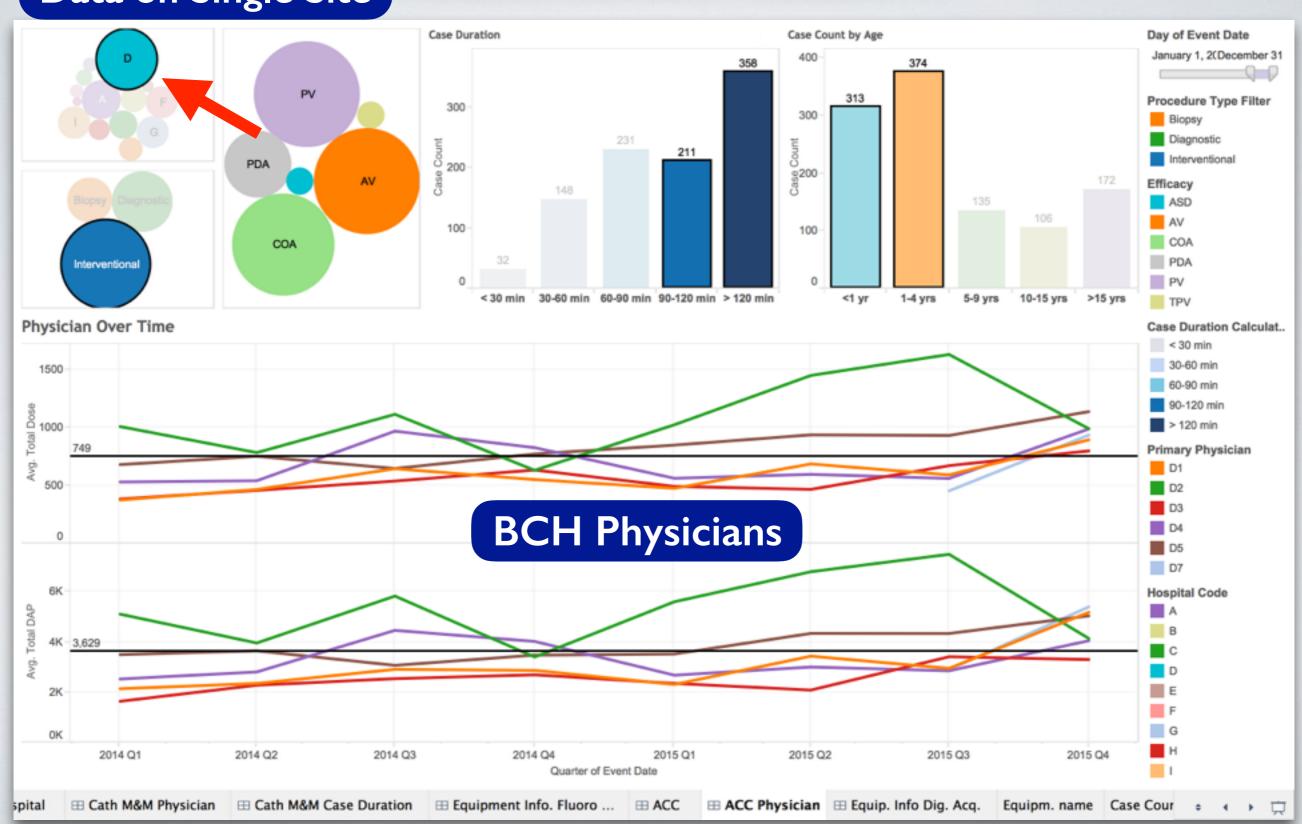
- * New dose benchmarks established by C3PO-QI between 2014 to 2015 will be presented at the SCAI conference in May 2016
- * The on-demand report for the procedure-specific quality metric has now as been updated using the new outcome benchmark in C3PO
- * We will continue to the move the "Bar" moving forward

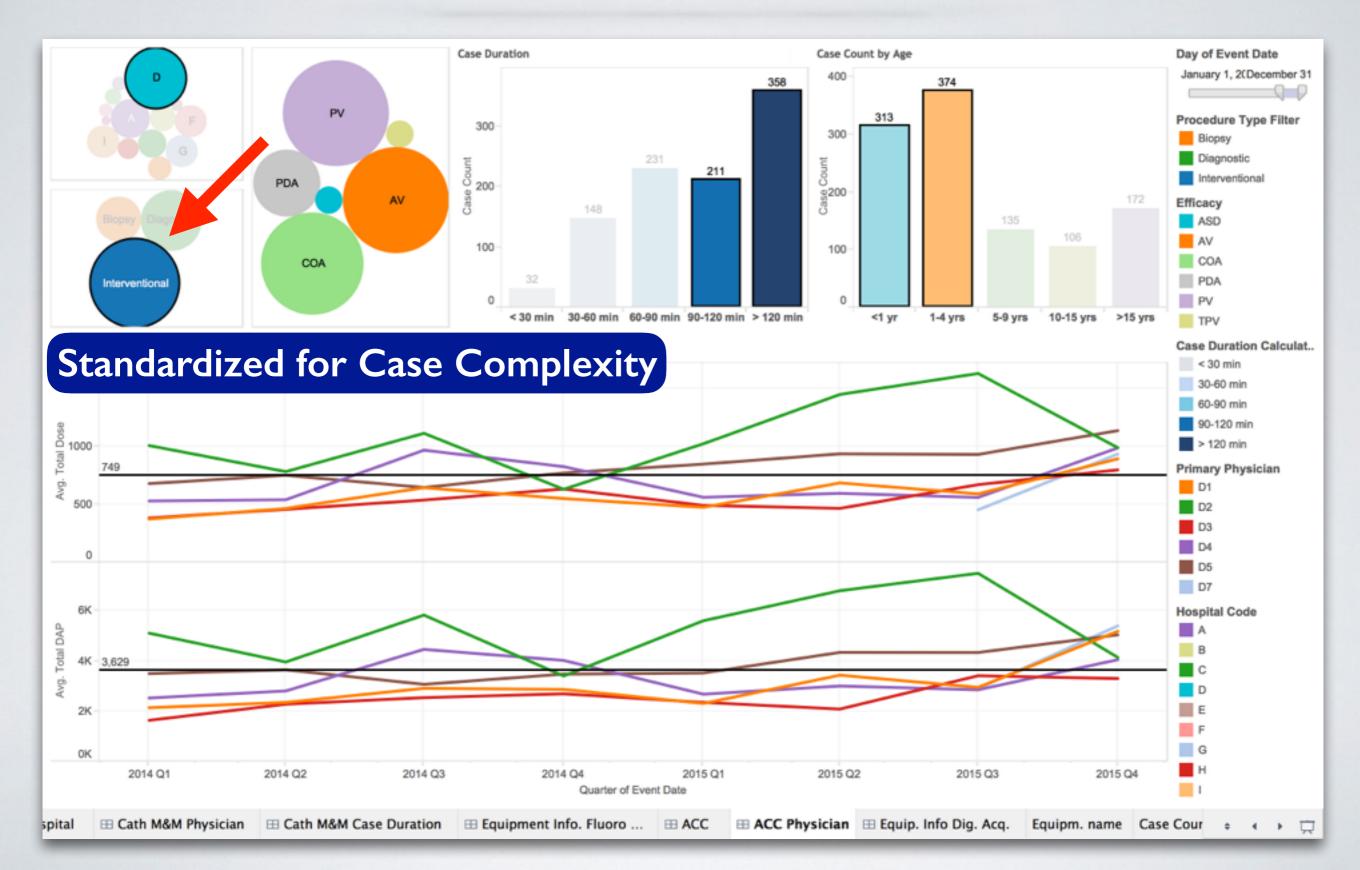


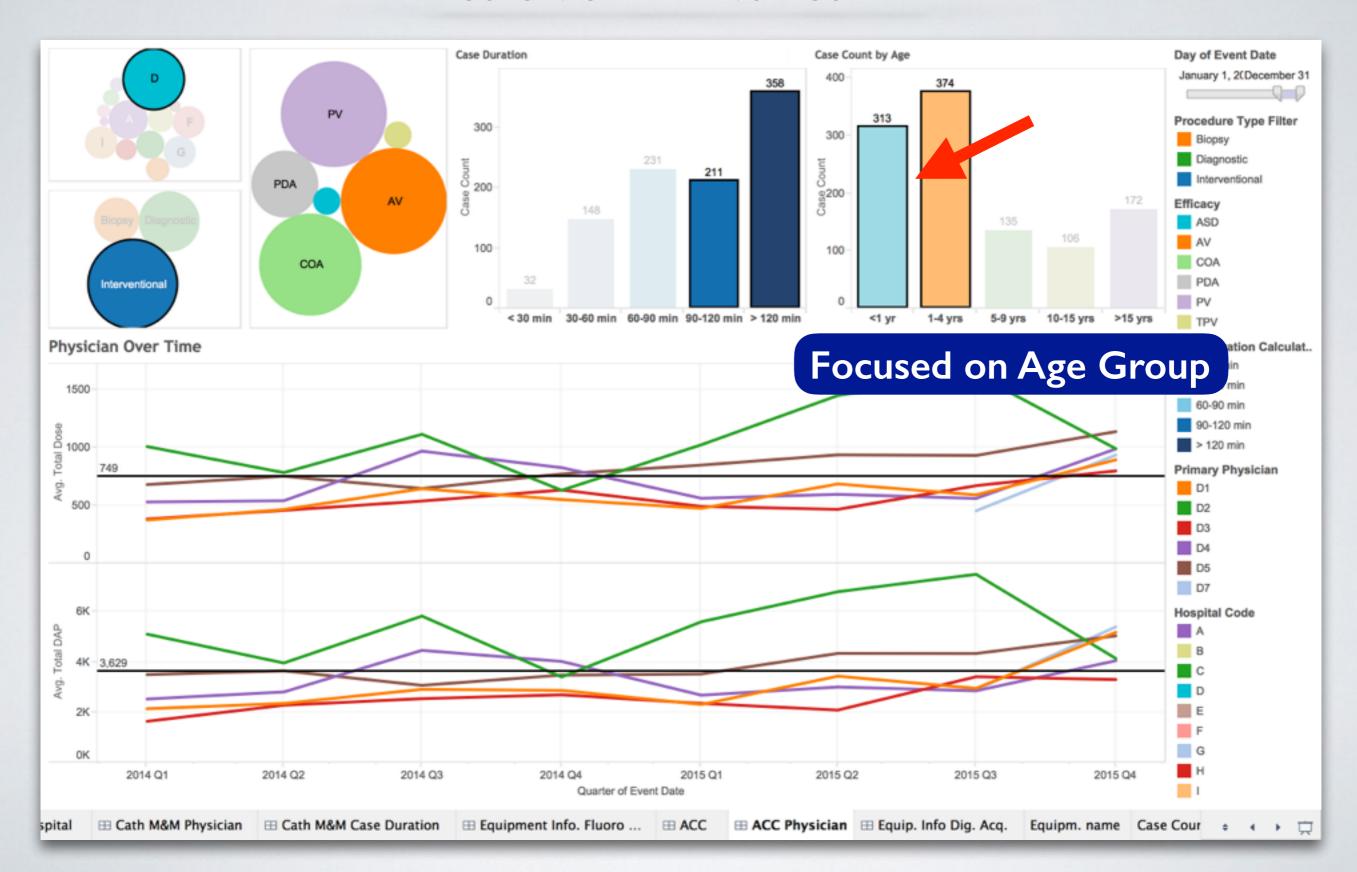


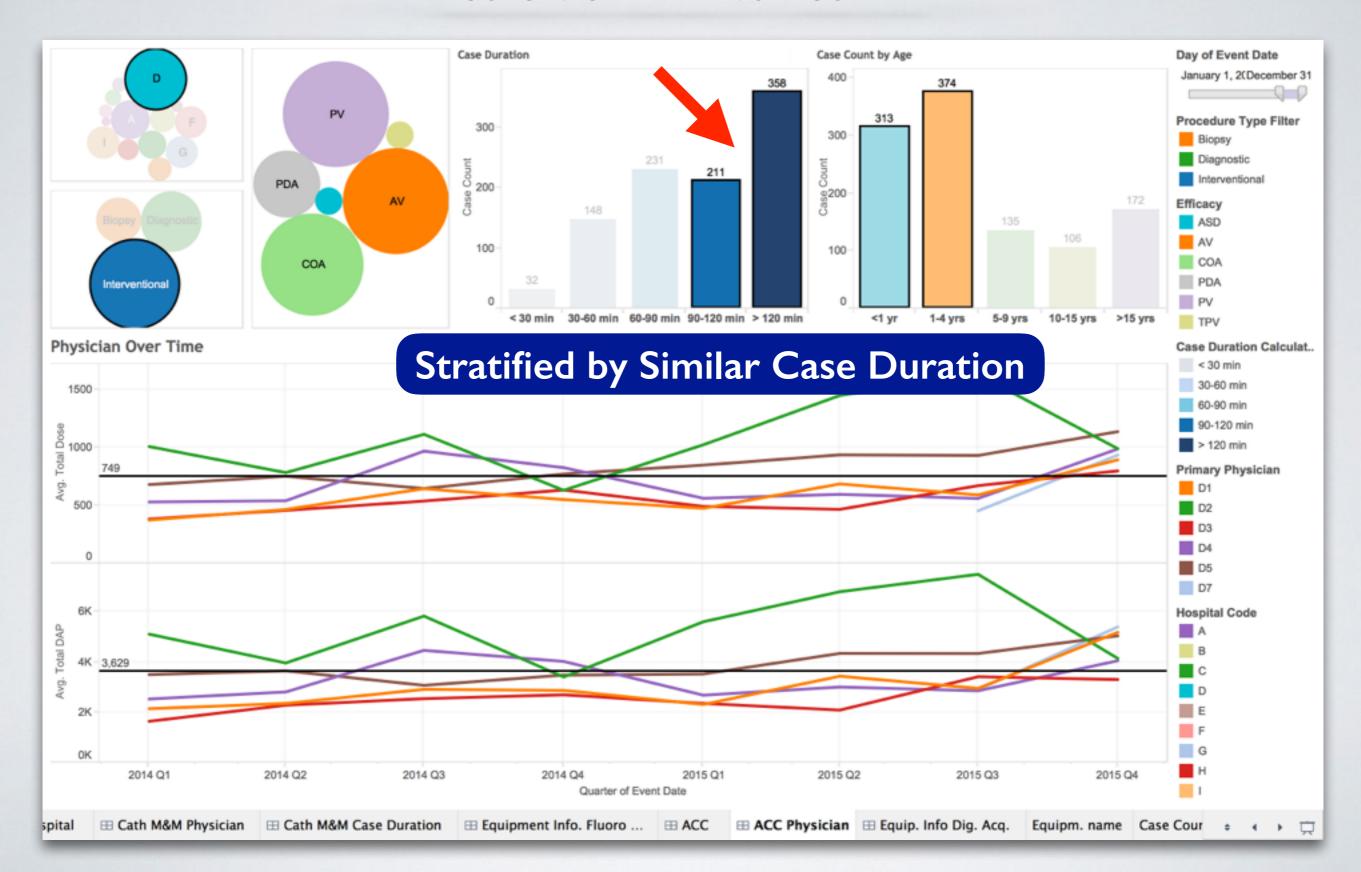
BOSTON CHILDREN'S HOSPITAL

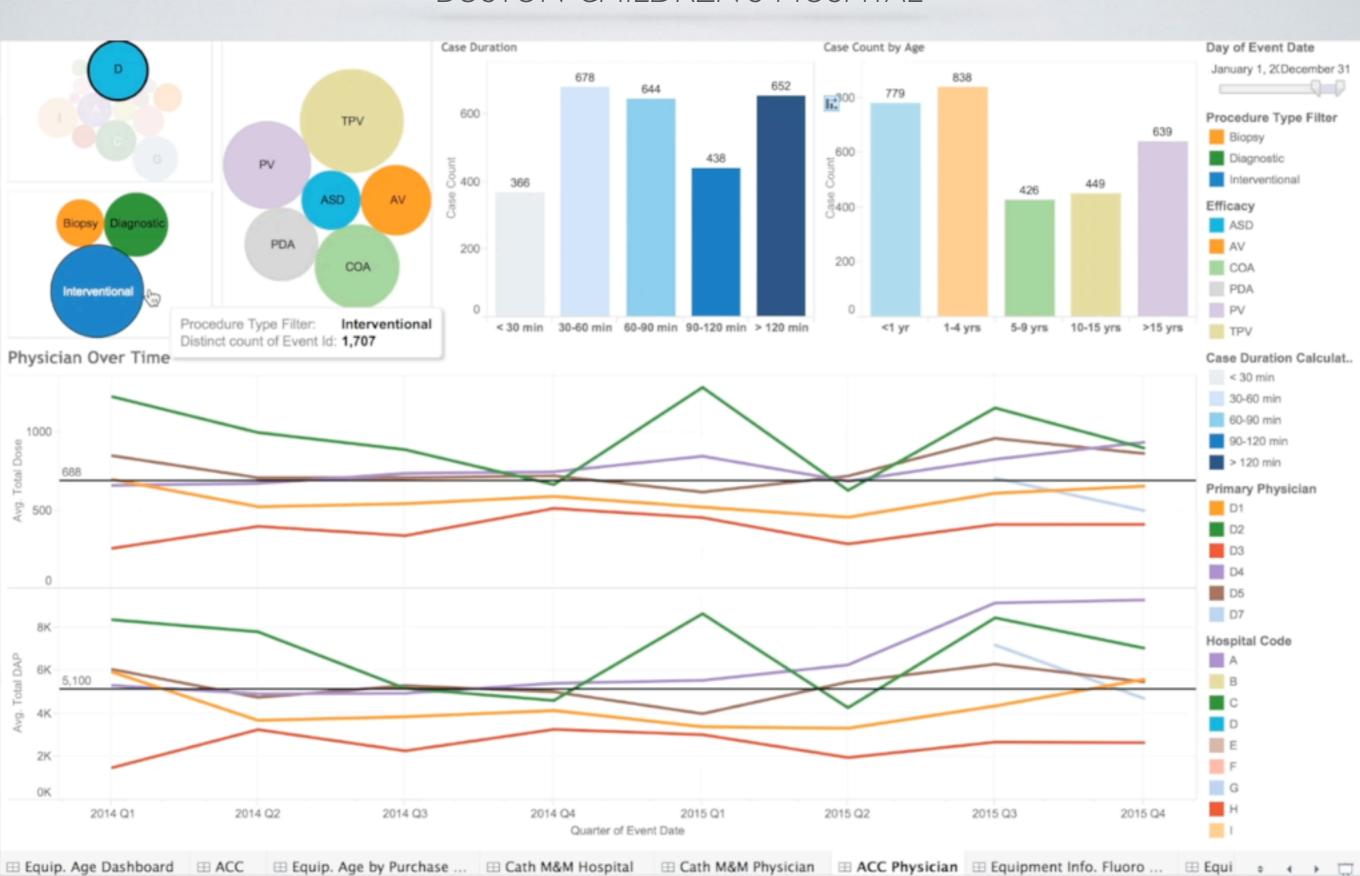
Data on Single Site



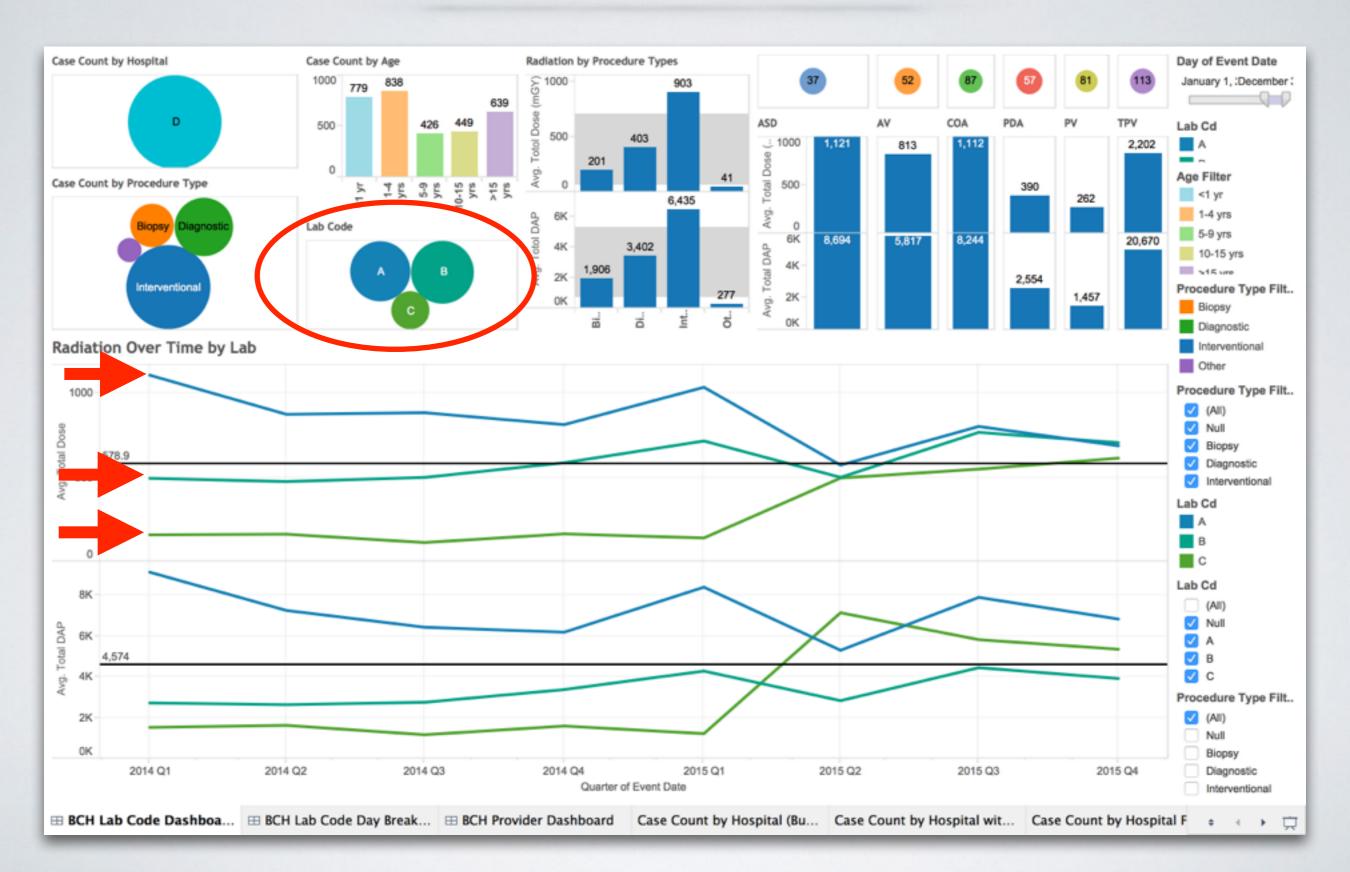


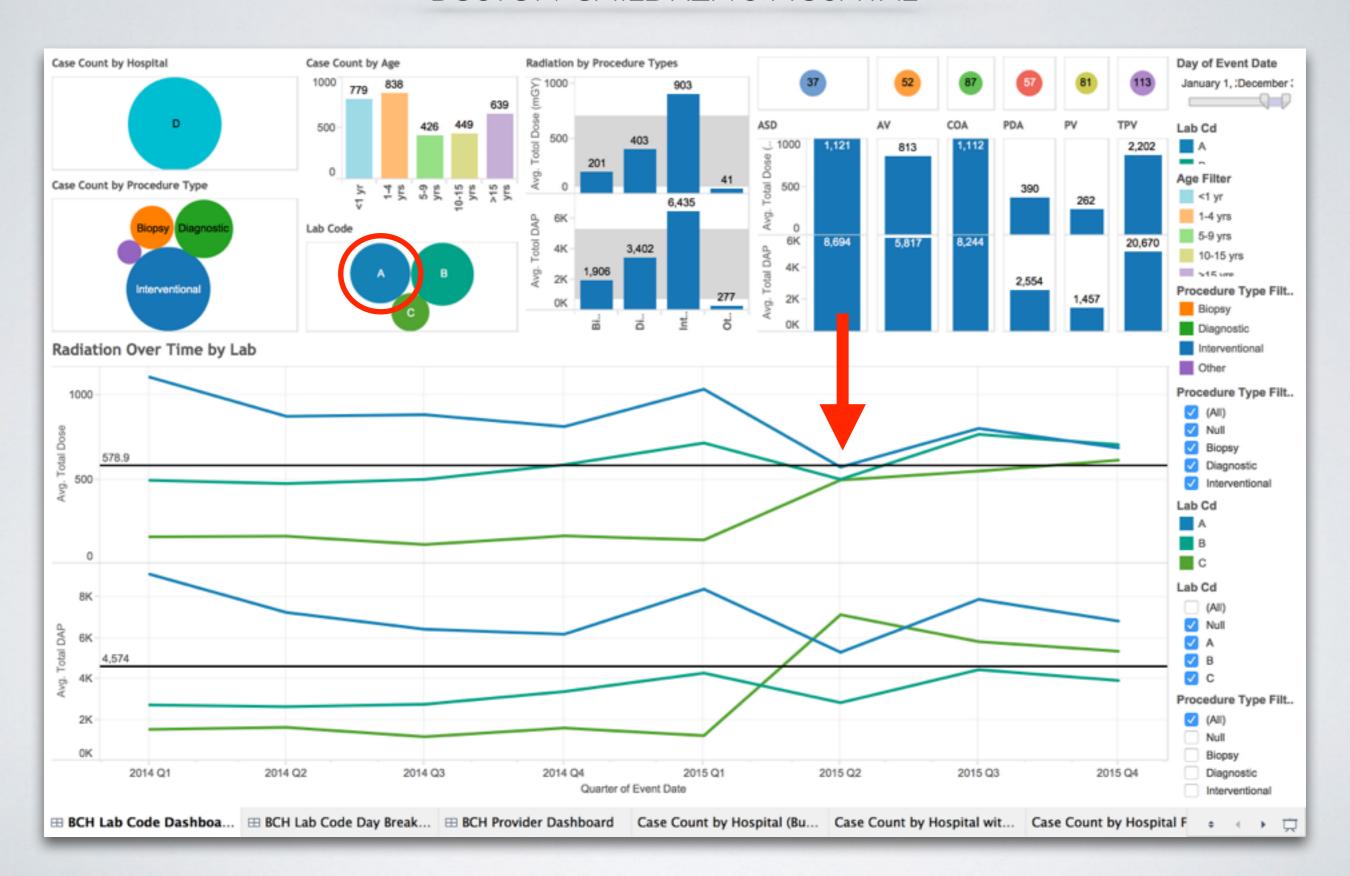






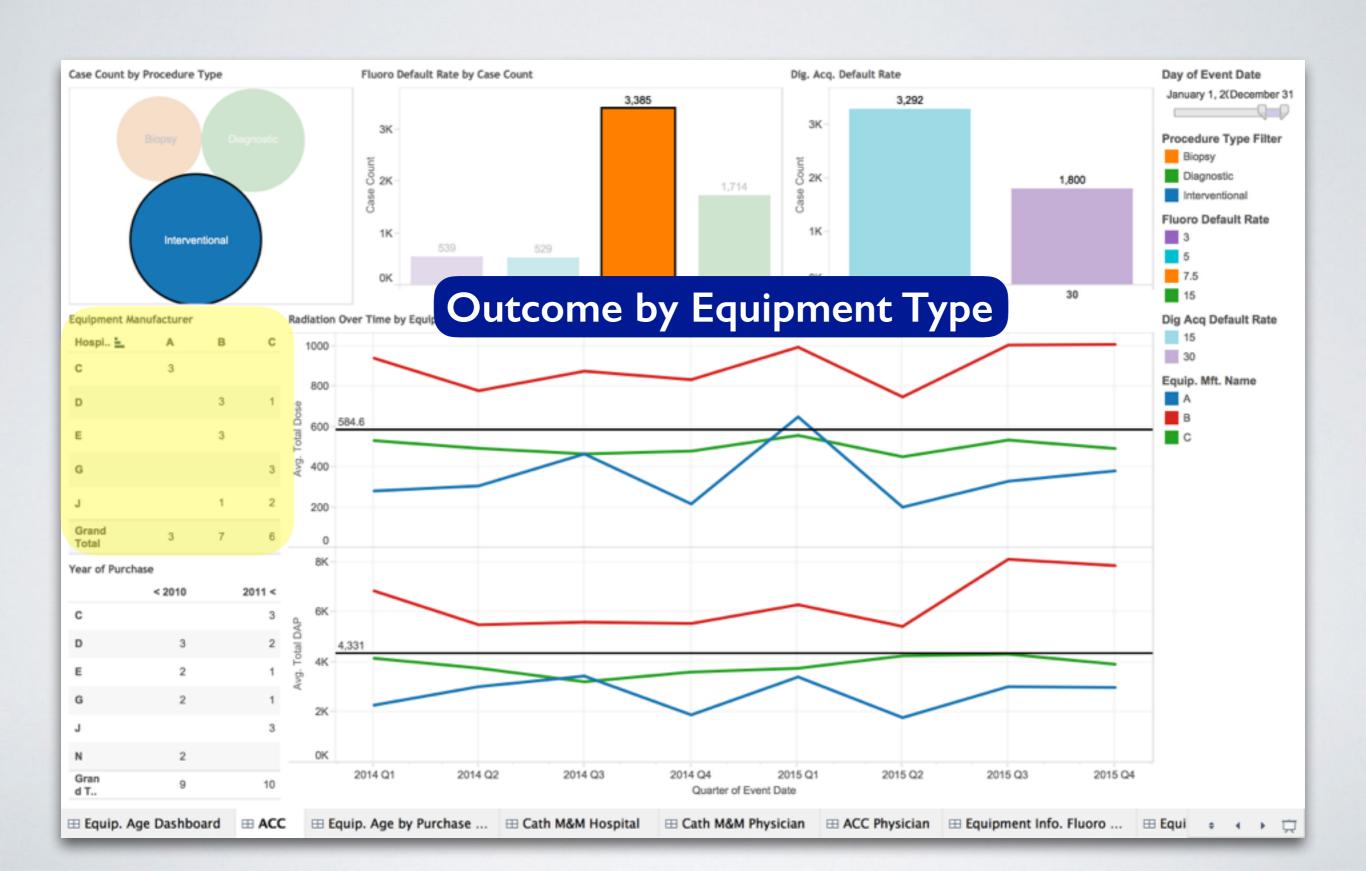






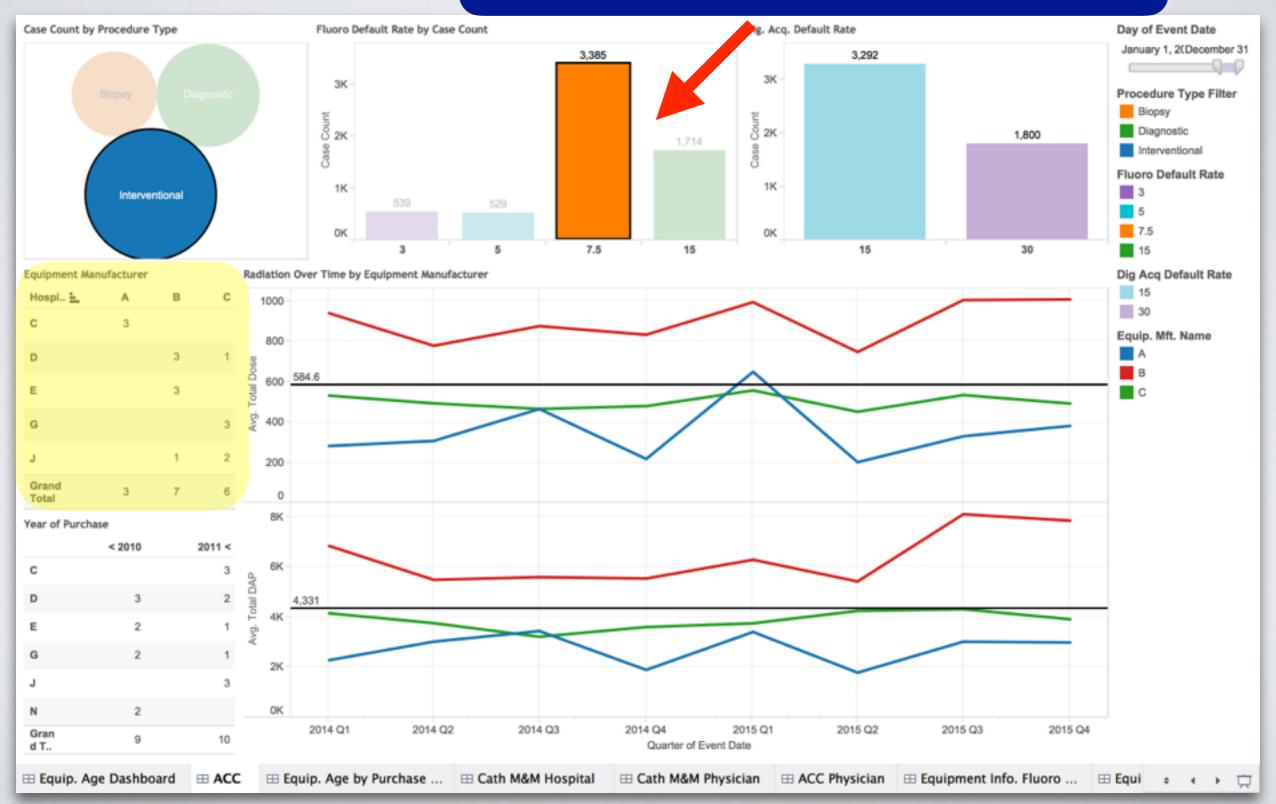


EQUIPMENT MANUFACTURER

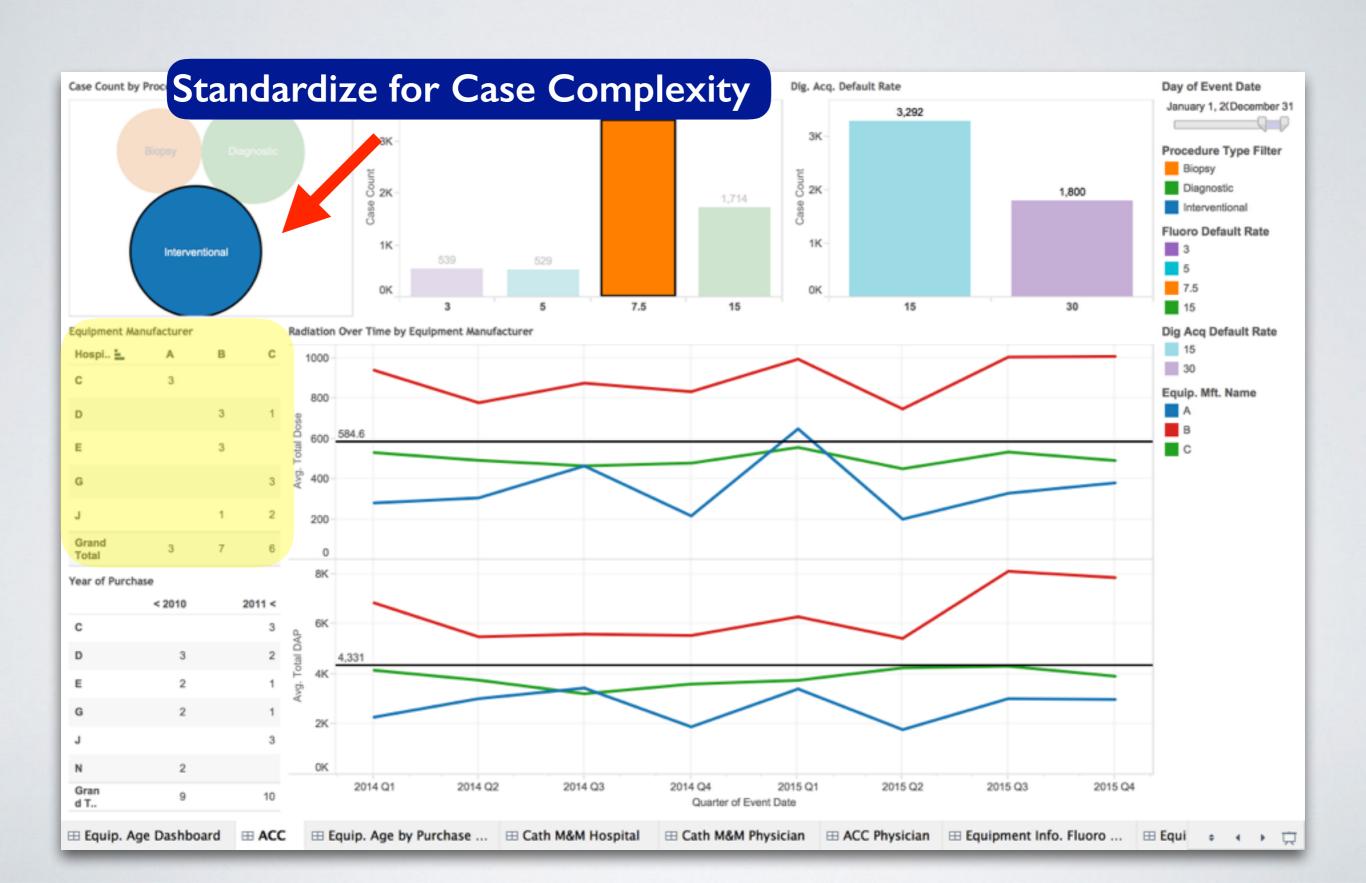


EQUIPMENT MANUFACTURER

Account for Differences in Site Practice



EQUIPMENT MANUFACTURER



Measurement

Metrics

Collaboration

Learning Cycles

Radiation Reduction

Radiation Reduction Initiatives

KEY DRIVER DIAGRAM

Congenital Cardiac Catheterization Outcomes Project - Quality Improvement

2. Institutions with similar equipment to work on implementation within subgroups

1. Collect radiation data in the C3PO-QI Database Provide Tools for 2. Provide detailed reports to providers on radiation parameters Measurement 1. Bi-weekly meetings 2. Employ use of PDSA Cycles **Processes for** 3. Target areas for improvement Improvement 1. Establish a multidisciplinary catheterization laboratory radiation safety committee 2. Structured radiation learning seminars for physicians and fellows Ensure proper 3. Radiation Best Practice Signs in Lab education of staff 4. Weekly Safety Tip Emails 5. Publish monthly radiation metrics in lab **Reduce Radiation Exposure During** 1. Utilize store fluoroscopy instead of cine Congenital 2. Single plane acquisitions instead of bi-plane Catheterization 3. Use of filtration or low dose settings **Optimizing Operator** 4. Minimize zoom settings: change calibration Techniques 5. Collimation for filtration practices 6. Lowering image intensifier 7. Use of digital subtraction angiography Optimize Use of 1. Reduce frame rate for designated acquisitions Equipment 2. Assess equipment differences at institutions to and determine variation in dose to optimize default settings 1. One-on-One discussions with mfgs. to implement suggested changes and obtain Equipment necessary acquisitions Manufacturer

Discussions



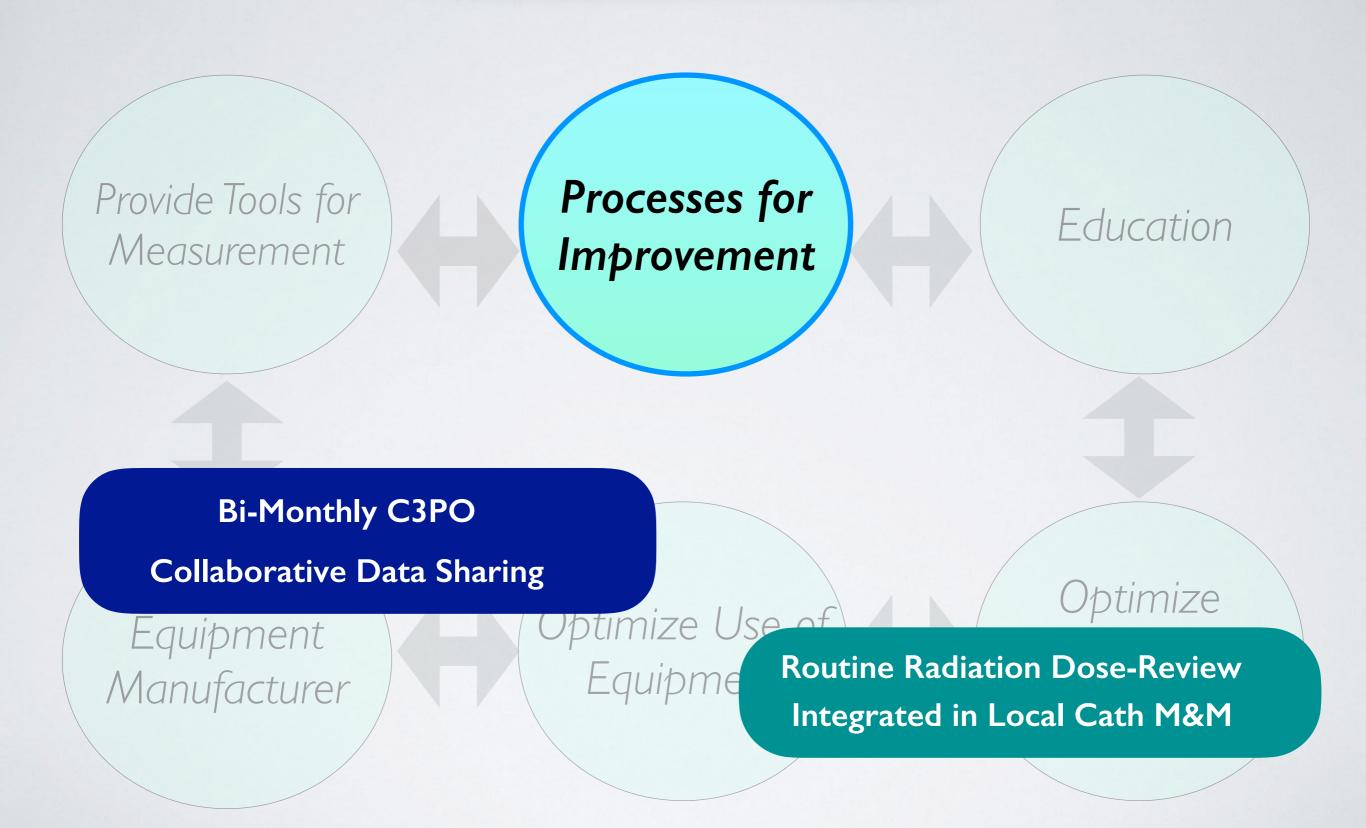
C3PO Website
on Demand Reports

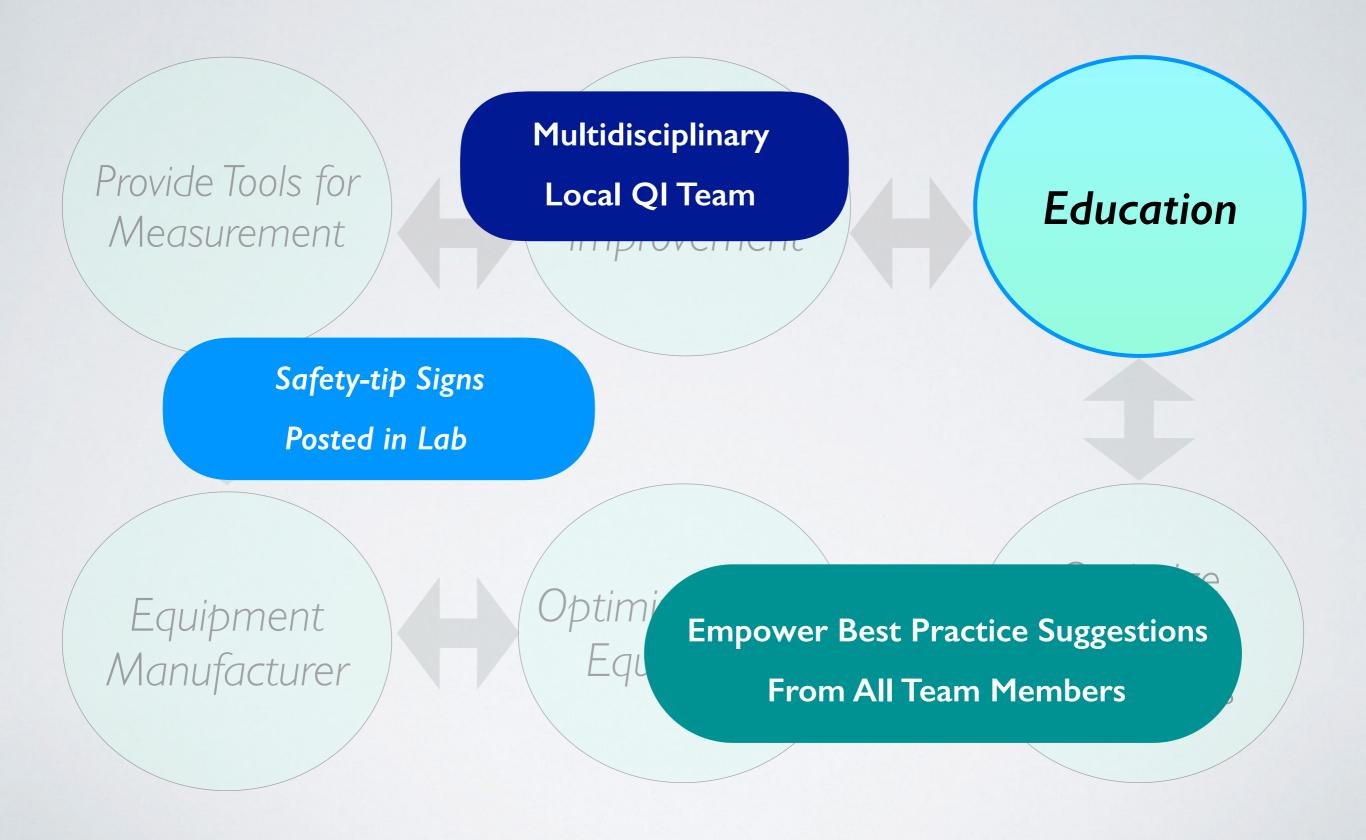
Education

Equipment Manufacturer Customized Predefined Reports at Requested Intervals

Equipment

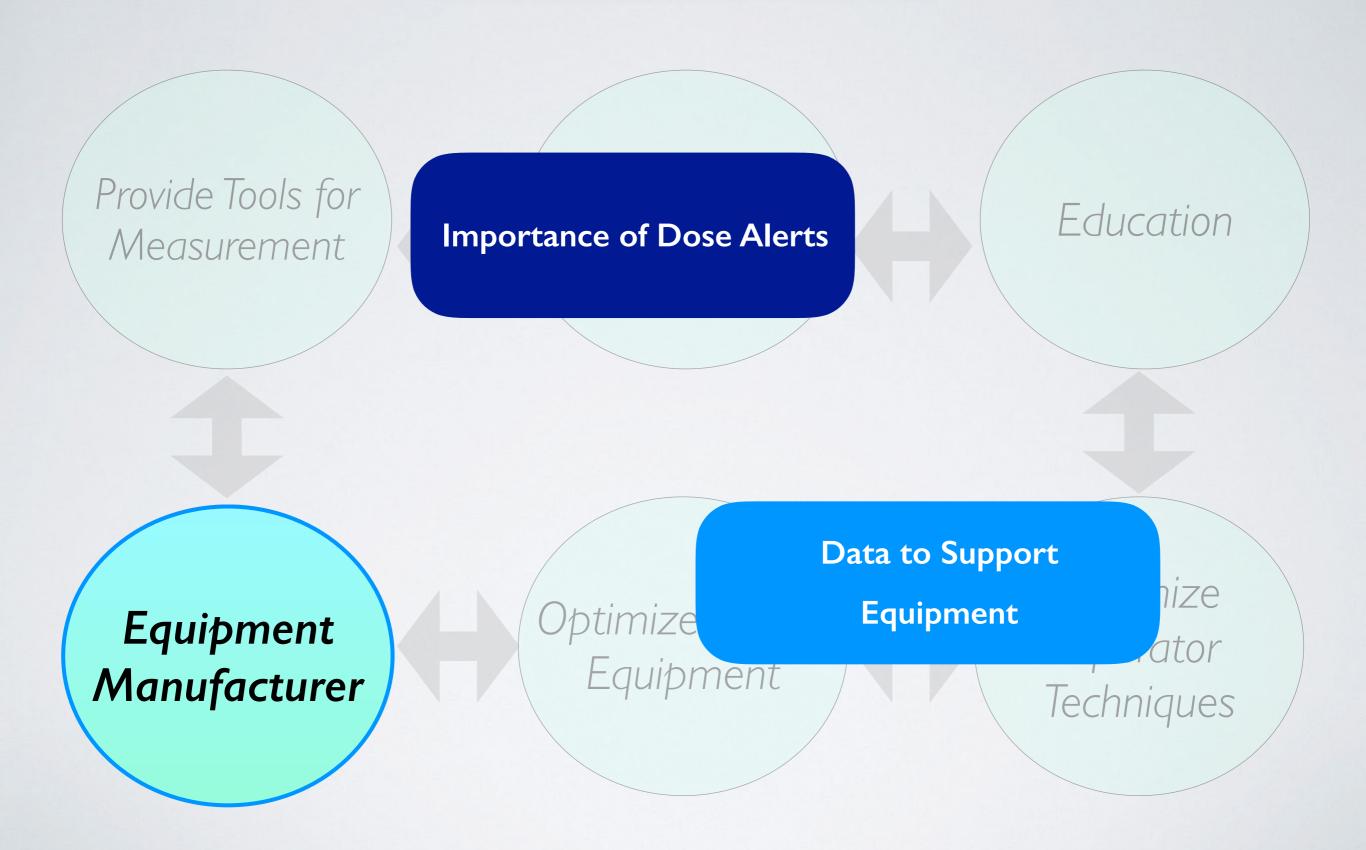
Optimize
Operator
Techniques

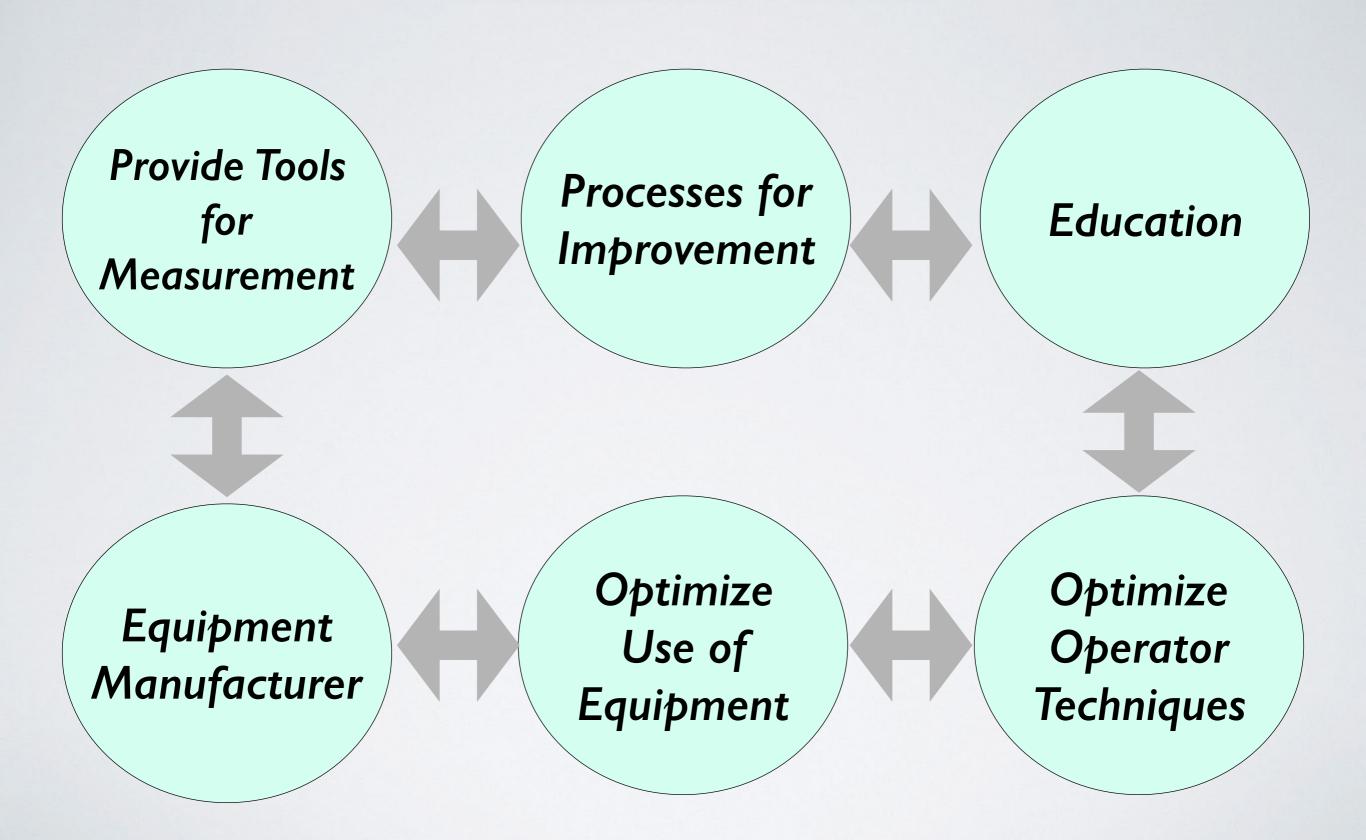




Start at Lower Default Frame-Rate and Increase Only if Required Provide Tools for Education Measurement Improvement Minimize Cine Acquisition **Optimize** mize Use of **Operator** Decrease "Pedal" Time quipment **Techniques**

Set Low Default Acquisition Rates Provide Tools for Education Measurement Improvement **Utilize Store Fluoroscopy Patient Size Specific Settings Optimize** Optimize Equipment Use of Operator Manufacturer Techniques Equipment





CONCLUSIONS

Challenges Include

Data Entry Burden

Time for Data Review and Discussions

CONCLUSIONS

The Community has an Undeniable...

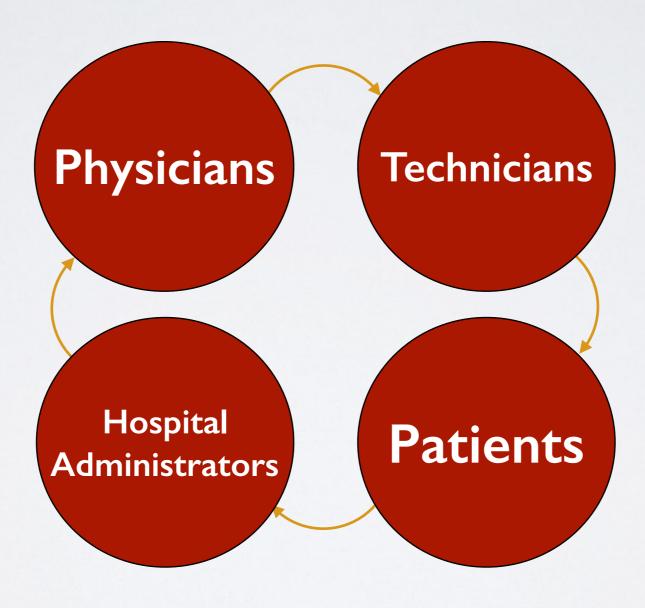
Agreement on the Critical Importance

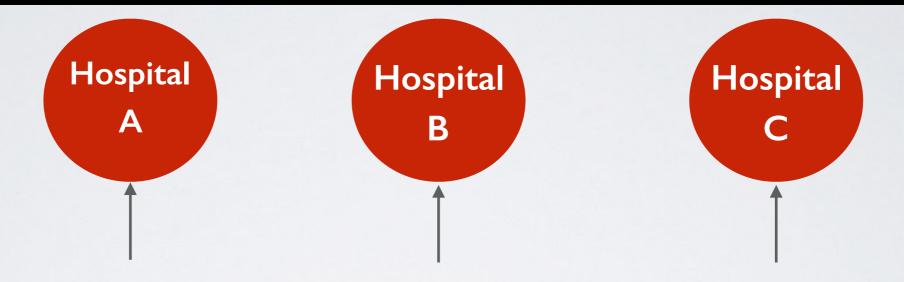
Desire to Reduce Radiation Exposure in Patients

Commitment to Rapid Improvement

CONCLUSIONS

Radiation safety initiatives have become a community conversation





Through collaboration and learning cycles...



We Can Raise the Bar Lower Benchmarks & Reduce Radiation



Boston Children's Hospital



C3PO-QI PARTICIPATING SITES

Congenital Cardiac Catheterization Outcomes Project - Quality Improvement



Thank you!