

Linking Electronic Medical Record with National Cardiovascular Data Registry CathPCI Registry for Readmission and Mortality Tracking in a Single Healthcare System

Dale Henion, MPS Candidate



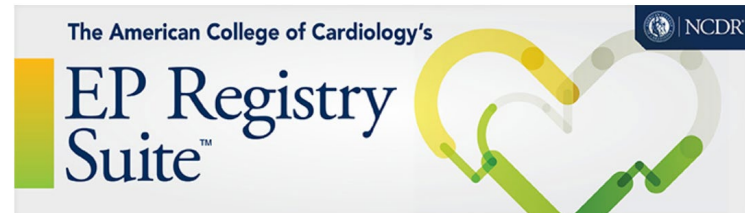
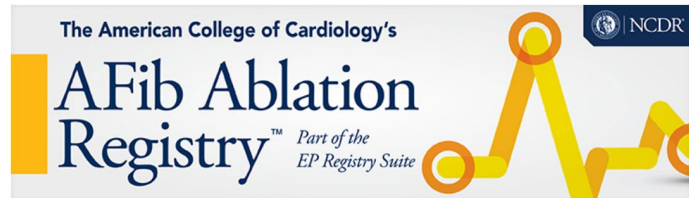
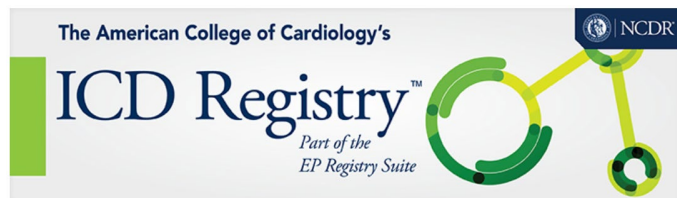
CAROLINA HEALTH INFORMATICS PROGRAM

Improving Healthcare with Intelligence



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

UNC
HEALTHSM



Solving For Quality

Current/Baseline Process

6 months...

Into EMR

Abstracted

Into Database

Registry



\$

Database

Analytics

or

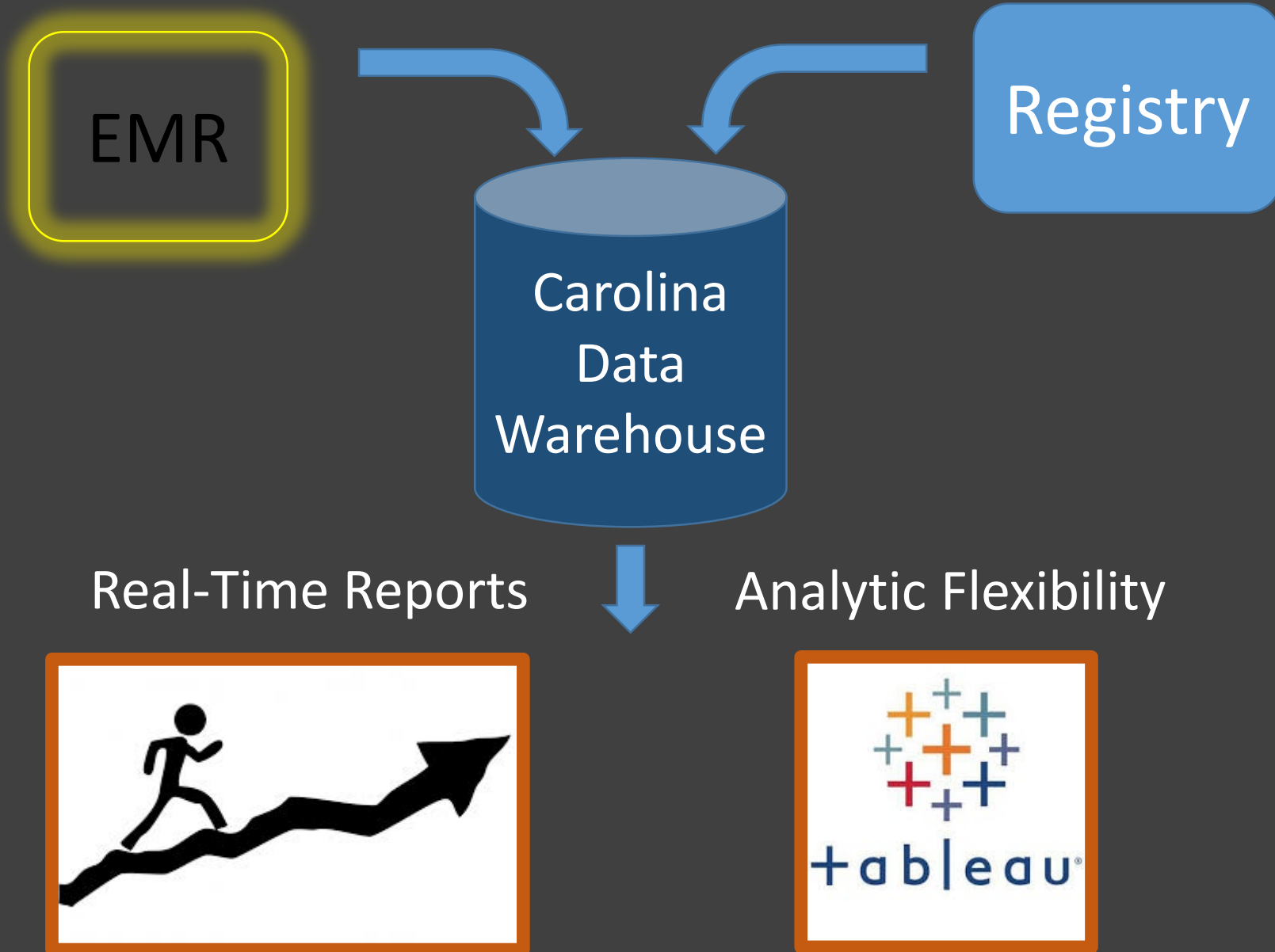
Metric Name	My Hospital 2012Q2	US 50th Pct 2012Q2
PCI Performance Measures		
1 - PCI in-hospital risk adjusted mortality (all patients)		1.59
38 - Composite: Discharge Medications in Eligible PCI Patients		91.3
PCI Process Metrics		
2 - Proportion of elective PCIs with prior positive stress or imaging study		61.7
3 - Median time to immediate PCI for STEMI patients (in minutes)		61.8
4 - Proportion of STEMI patients receiving immediate PCI w/in 90"		93.1
5 - Median time from ED arrival at STEMI transferring facility to ED arrival at STEMI receiving facility among transferred patients.		80.0
6 - Median time from ED arrival at STEMI transferring facility to immediate PCI at STEMI receiving facility among transferred patients (in minutes)		112.2
7 - Median fluoro time (in minutes)		9.2
8 - Proportion of patients with aspirin prescribed at discharge		98.5
9 - Proportion of patients with a P2Y12 inhibitor prescribed at discharge		99.3
10 - Statins prescribed at discharge		93.4
Diagnostic Cath Process\Outcomes Metrics		
20 - Incidence of non-obstructive CAD (elective patients only)		44.2
21 - Proportion of Diagnostic Catheterization procedures with vascular access site injury requiring treatment or major bleeding		0.2

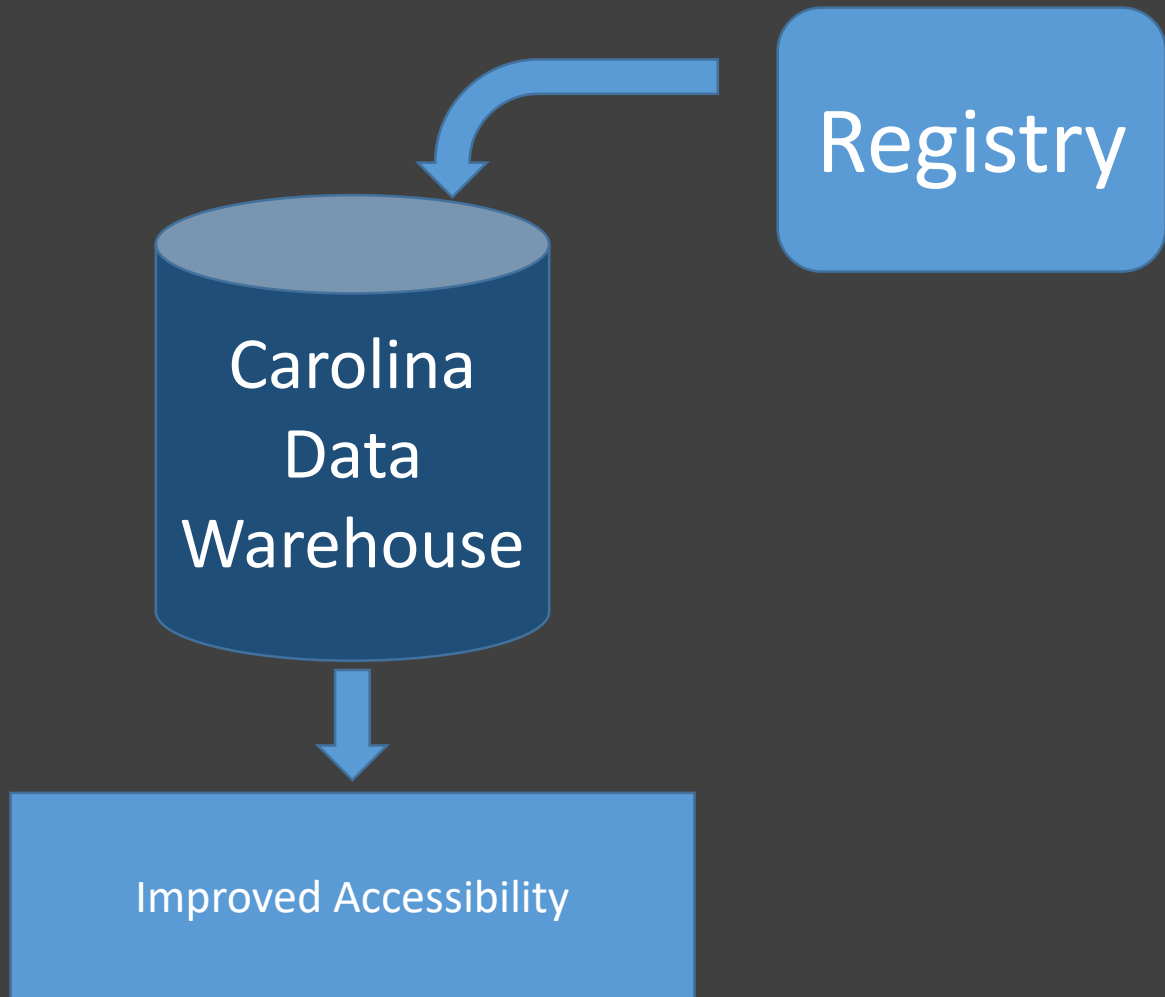


Initial Goals

- 1) Decrease delay of getting and using registry data
- 2) Add post-discharge readmission and mortality outcomes to data set
- 3) Provide a flexible front end user interface for analytics

Solution Model

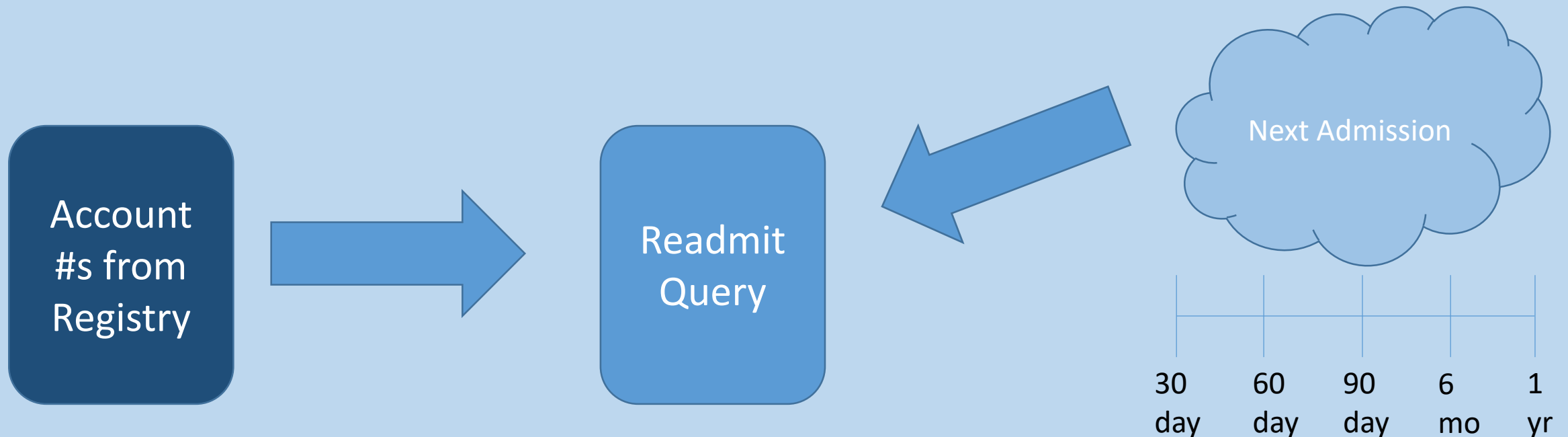




-
- Demographics
 - Insurance
 - H&P
 - Pre PCI tests
 - Pre Meds
 - Pre Meds V4 only
 - Procedure
 - Cath Visit
 - Indication Cath Visit
 - Native Stenosis >50%
 - Graft Stenosis >50%
 - PCI Procedure
 - Procedure Meds
 - Lesions
 - V4 Stenosis
 - Devices
 - Intra_Post Events
 - IntraPost Event Table
 - V4 IntraPost Events
 - Discharge
 - DC Meds
- A blue bracket on the left side of the list groups the first 12 items: Demographics, Insurance, H&P, Pre PCI tests, Pre Meds, Pre Meds V4 only, Procedure, Cath Visit, Indication Cath Visit, Native Stenosis >50%, Graft Stenosis >50%, and PCI Procedure.

EPIC Data - Readmissions

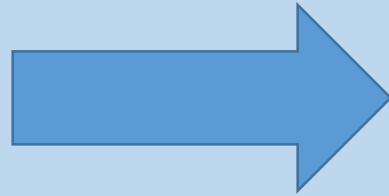
Modified existing tools for CMS reporting



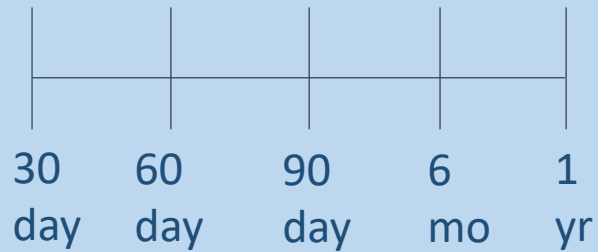
Mortality Data

EPIC Deceased Indicator
EPIC Date of Death
State Death Date

MRNs
from
Registry



Mortality
Query





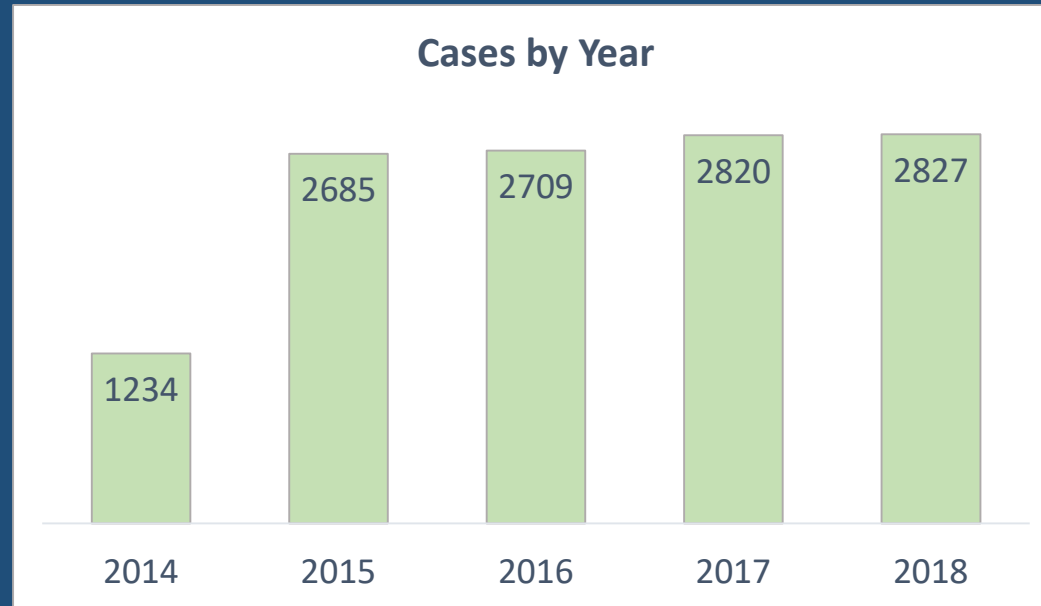
Results Summary

Date Range: 7/1/14 – 12/31/18

12,275 Cases

10,245 Patients

99%
Matched
Cohort



Outcome Analysis Summary

	30 Day	60 Day	90 Day	6 Month	1 Year	w/o date
Mortality %	3.10%	3.69%	4.34%	5.75%	7.99%	1.34%
Readmission	6.80%	9.89%	11.95%	16.72%	23.71%	

Outcomes Grouped by Sociodemographic

30 Day Mortality

Gender	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Female	2.0%	2.1%	3.4%	3.2%	4.6%
Male	3.1%	2.6%	2.8%	2.9%	3.4%
Age					
18-54	0.9%	0.8%	0.3%	2.0%	1.9%
55-64	2.3%	2.7%	2.4%	3.0%	2.4%
65-74	2.9%	2.3%	2.5%	2.0%	3.8%
75-84	3.1%	3.5%	5.2%	3.3%	4.9%
85+	10.3%	3.5%	7.9%	10.5%	8.6%
Insurance					
Medicaid	1.3%	4.3%	3.4%	6.5%	4.5%
Medicare	3.7%	2.6%	3.8%	2.9%	4.6%
Private	1.6%	1.9%	1.1%	1.8%	1.7%

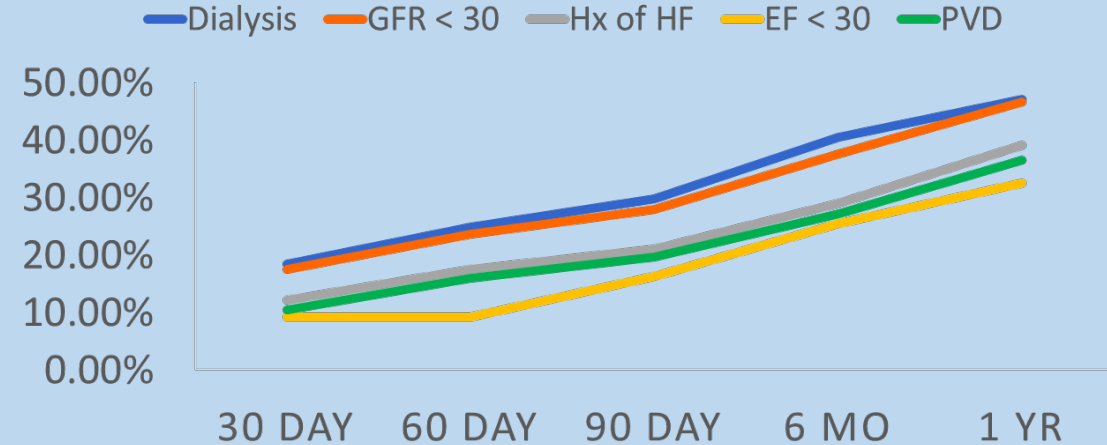
30 Day Readmissions

Gender	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Female	7.7%	8.8%	7.7%	7.9%	8.9%
Male	5.1%	5.8%	6.0%	5.6%	7.5%
Age					
18-54	4.0%	4.0%	5.4%	2.7%	6.3%
55-64	5.3%	6.1%	5.6%	4.9%	5.2%
65-74	6.8%	7.9%	6.3%	7.2%	7.8%
75-84	6.6%	6.1%	8.7%	8.1%	10.2%
85+	9.5%	13.2%	7.4%	12.4%	14.6%
Insurance					
Medicaid	5.7%	11.5%	9.8%	6.3%	10.6%
Medicare	7.7%	8.0%	7.5%	8.4%	8.9%
Race					
Black	8.3%	8.1%	8.8%	6.2%	9.1%
Caucasian	5.9%	6.3%	6.1%	6.3%	7.6%

Outcomes Grouped by Co-morbidity

	<u>30 Day Readmissions</u>				
	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Dialysis					
No	5.1%	6.5%	6.1%	5.9%	7.4%
Yes	28.6%	14.6%	17.0%	17.2%	23.0%
Heart Failure					
No	4.8%	5.4%	5.4%	5.2%	6.0%
Yes	11.1%	13.1%	11.8%	11.3%	15.0%
BMI					
<= 25	6.8%	8.3%	8.7%	7.8%	8.9%
25 - 27.5	5.7%	6.3%	6.8%	7.4%	9.1%
> 27.5	5.7%	6.4%	5.7%	5.6%	7.2%

READMISSION RATES FOR SELECTED SUBGROUPS



Rise in readmissions beyond 30 days post discharge illustrate opportunity to improve outcomes with projects emphasizing care coordination and follow-up.

Outcomes Dashboards

Groups Outcomes
Across Many Other
Factors

Demo Available

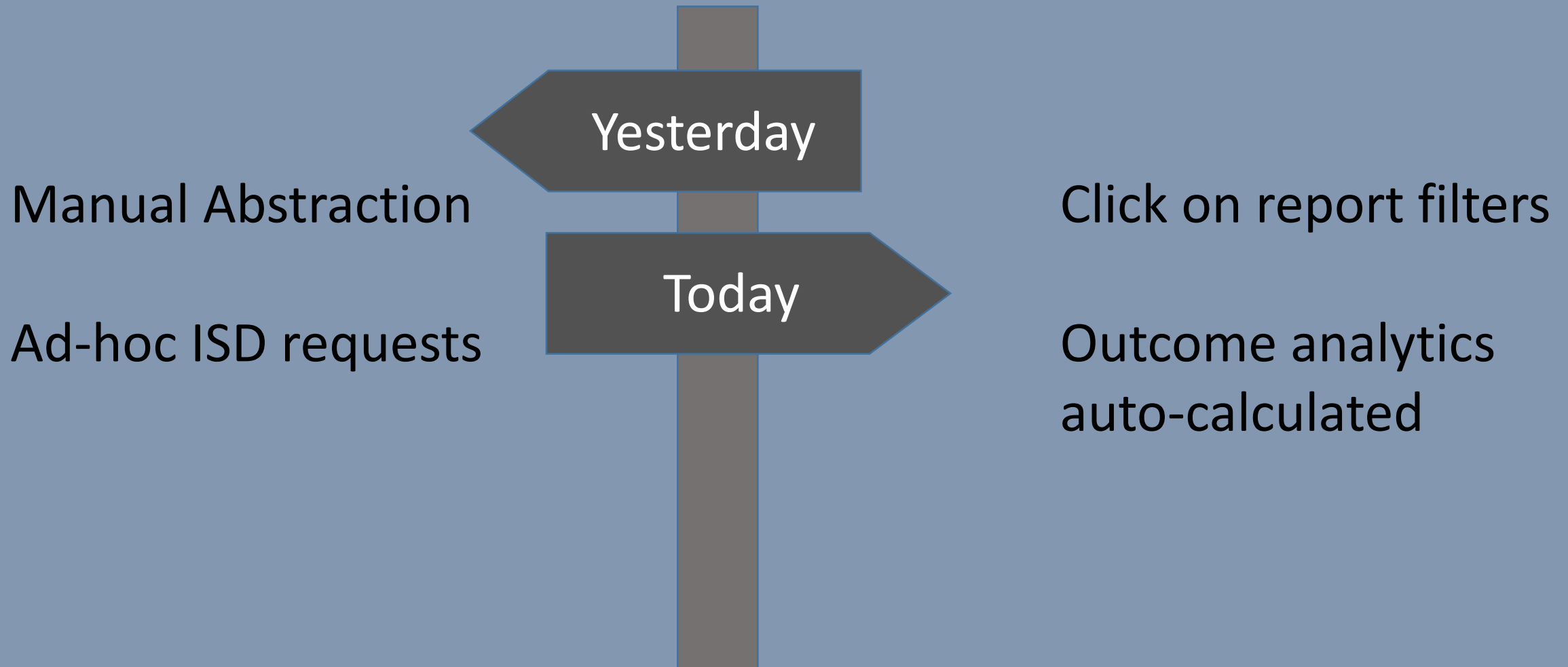
Advantages and Utilization

1) Data Accessibility

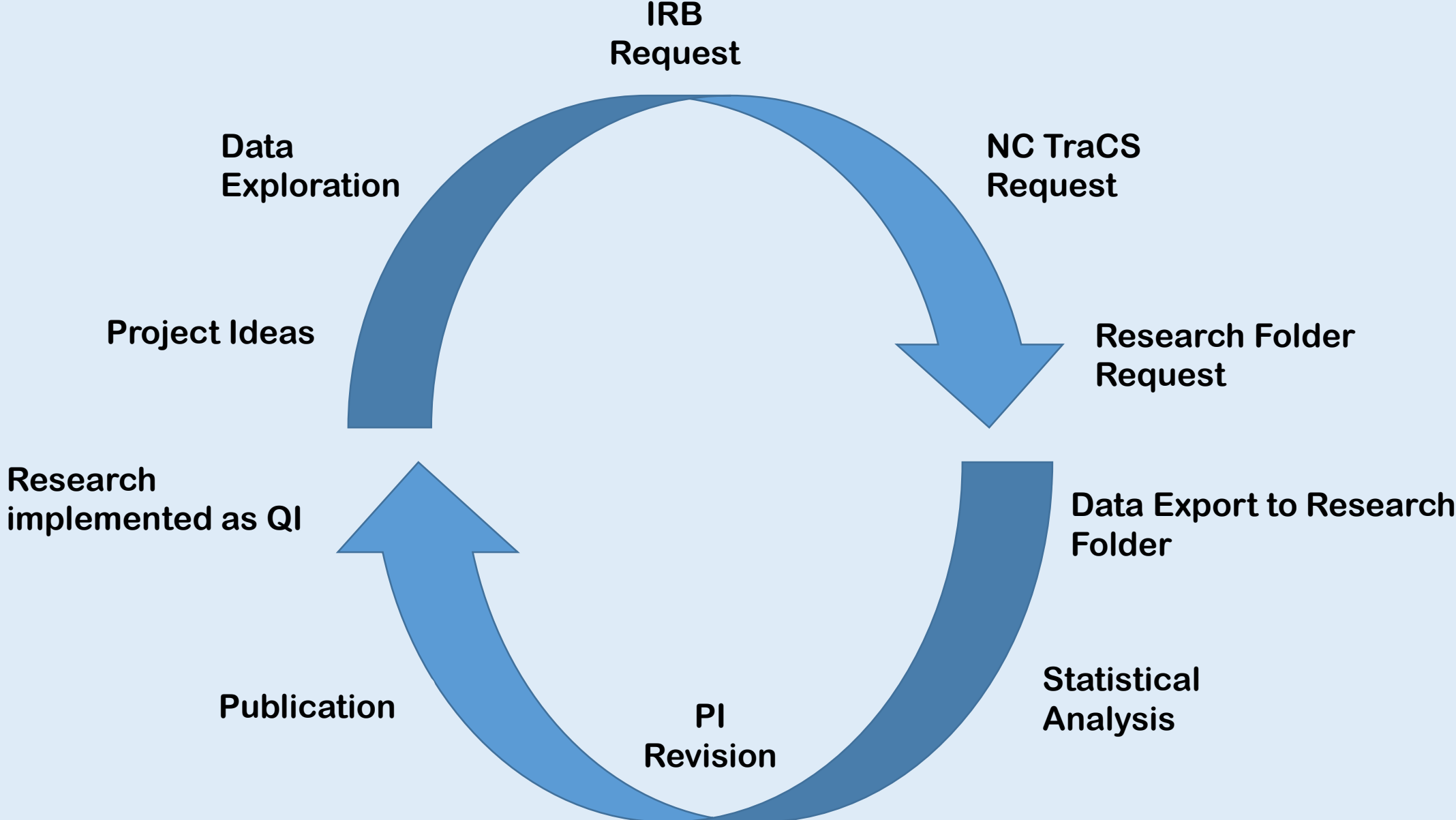
- Easy filter selection operates across all patient level details and group analysis



Research with Real World Data



UNC Cardiology Research & QI Cycle



Advantages and Utilization

- 1) *Data Accessibility*
- 2) **Customize for each QI/research project... save as (file)... automate run frequency and email recipients**



Quality Improvement

Ongoing Case Level Collection for QI Focus

Max creatinine pre	Max creatinine post	Creatinine Increase measure	Cr % Increase	AKI Stage
0.69	0.89	0.2	1.29	1
0.71		-0.71		
1.17		-1.17		
0.68	0.61	-0.07	0.9	1
1.2	0.92	-0.28	0.77	1
0.91		-0.91		
0.88		-0.88		
1.25	1.08	-0.17	0.86	1
0.99	0.98	-0.01	0.99	1
0.56	0.51	-0.05	0.91	1
0.82		-0.82		
0.79	0.77	-0.02	0.97	1
1.1	1.15	0.05	1.05	1
0.96	0.83	-0.13	0.86	1
1.17		-1.17		

Monthly QI Dashboard Automated For Display

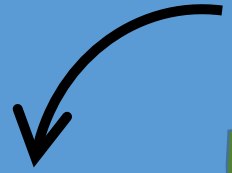
Month of Cath	July	August	September	October	November	December	January	February
Count Access Site Bleeds	0	3	0	0	0	2	0	1
Creatinine post check rate	0.7	0.74	0.66	0.71	0.64	0.76	0.66	0.67
Count AKI Stage 3	4	12	1	7	5	5	7	1
Count AKI Stage 2	1	2					5	
Count AKI Stage 1	166	198	147	210	126	155	155	49
Count AKI (all)	171	212	148	217	131	160	167	50

Project Summary

- 1) Successfully linked cohort across systems
- 2) Successfully automated outcome tracking
- 3) Enabled sub-group outcome analysis
- 4) Built a valuable asset for research and quality improvement



Learning Healthcare System



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Questions?