New Data Managers Session

- *Melinda Offer, RN, MSN*

Learning Objectives:

Upon completion of this session, participant will be able to:

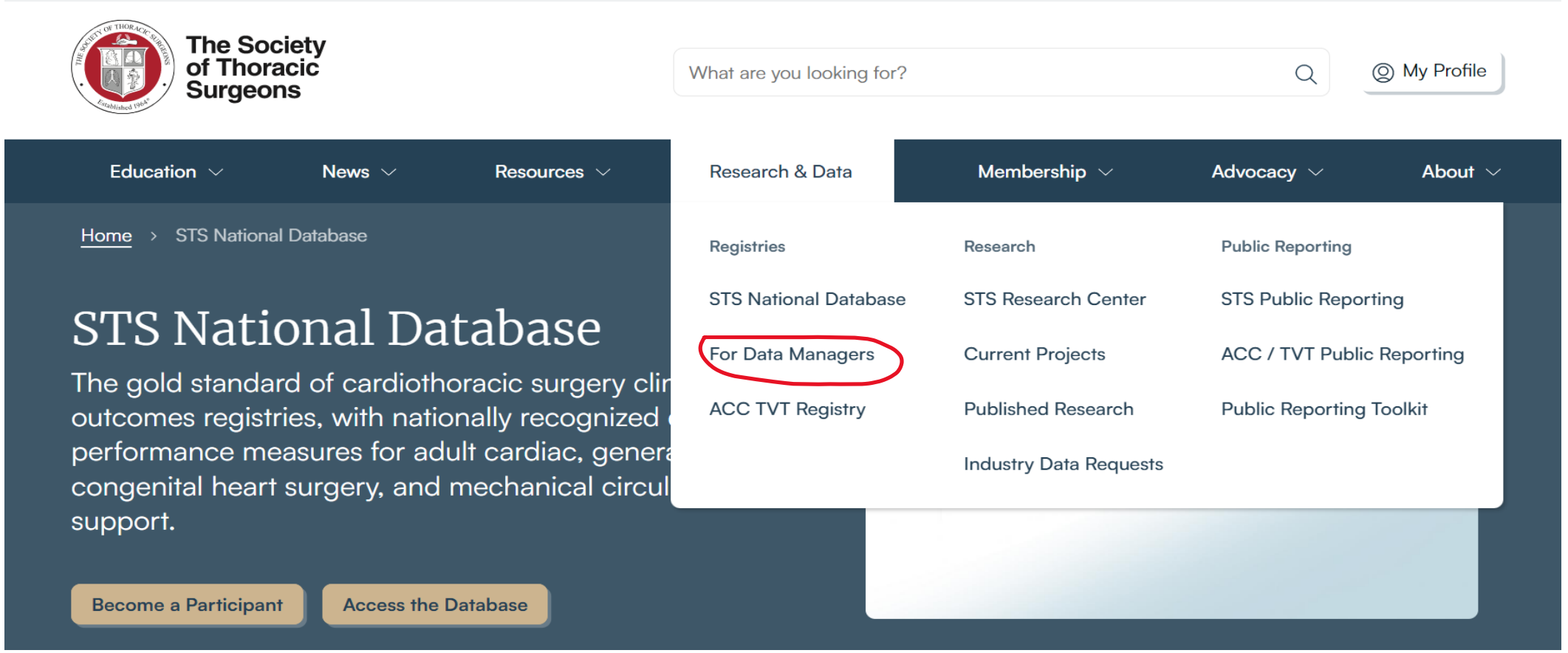
- Identify STS Educational Resources
- Understand how to read the Data and Software Specifications
- Understand the Procedure ID Chart
- Identify resources within the National Harvest Report

LET THE GAMES BEGIN

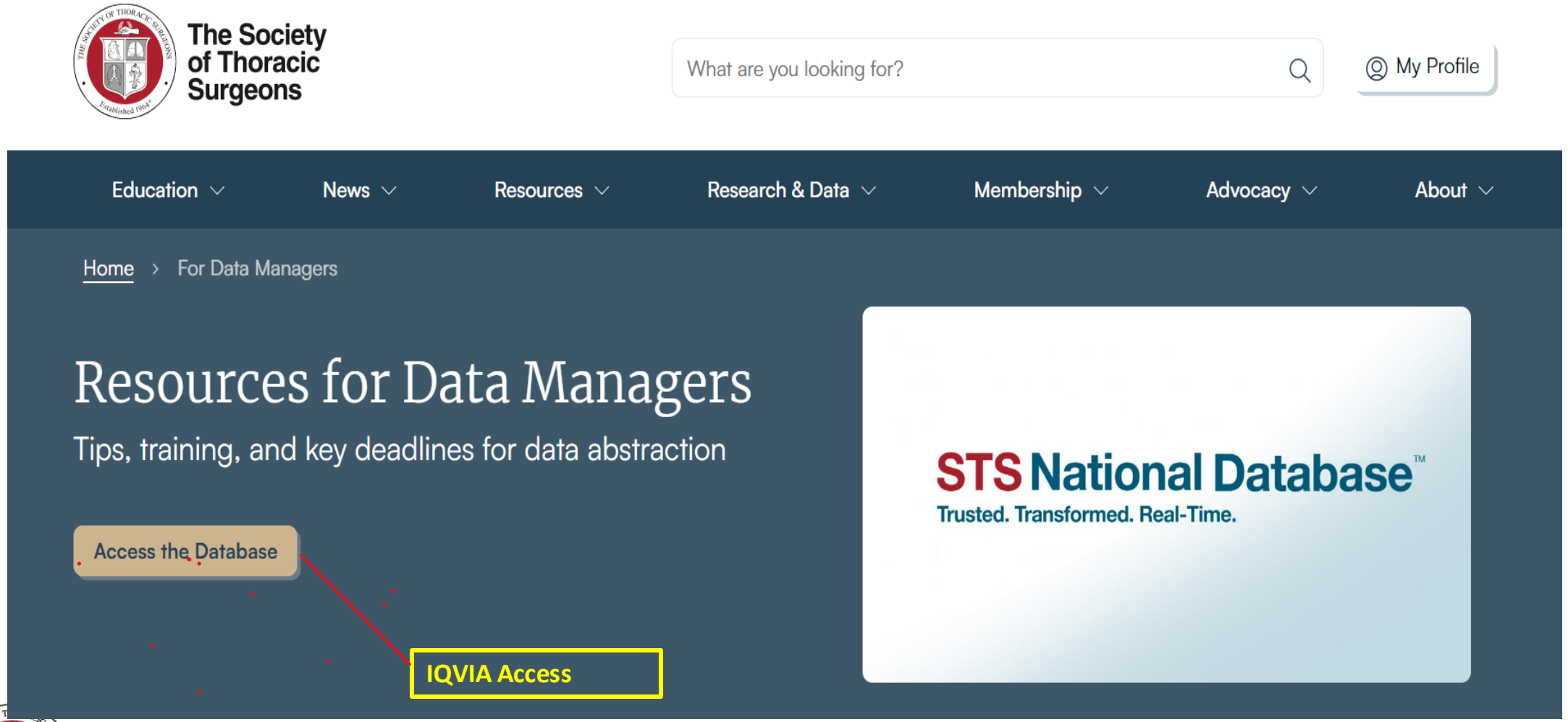
Data Manager Resources

- STS Website
- Webinars
- Mentorship Program
- Advances in Quality Outcomes Conference (AQO)
- Database News newsletter
- ACSD– Regional groups

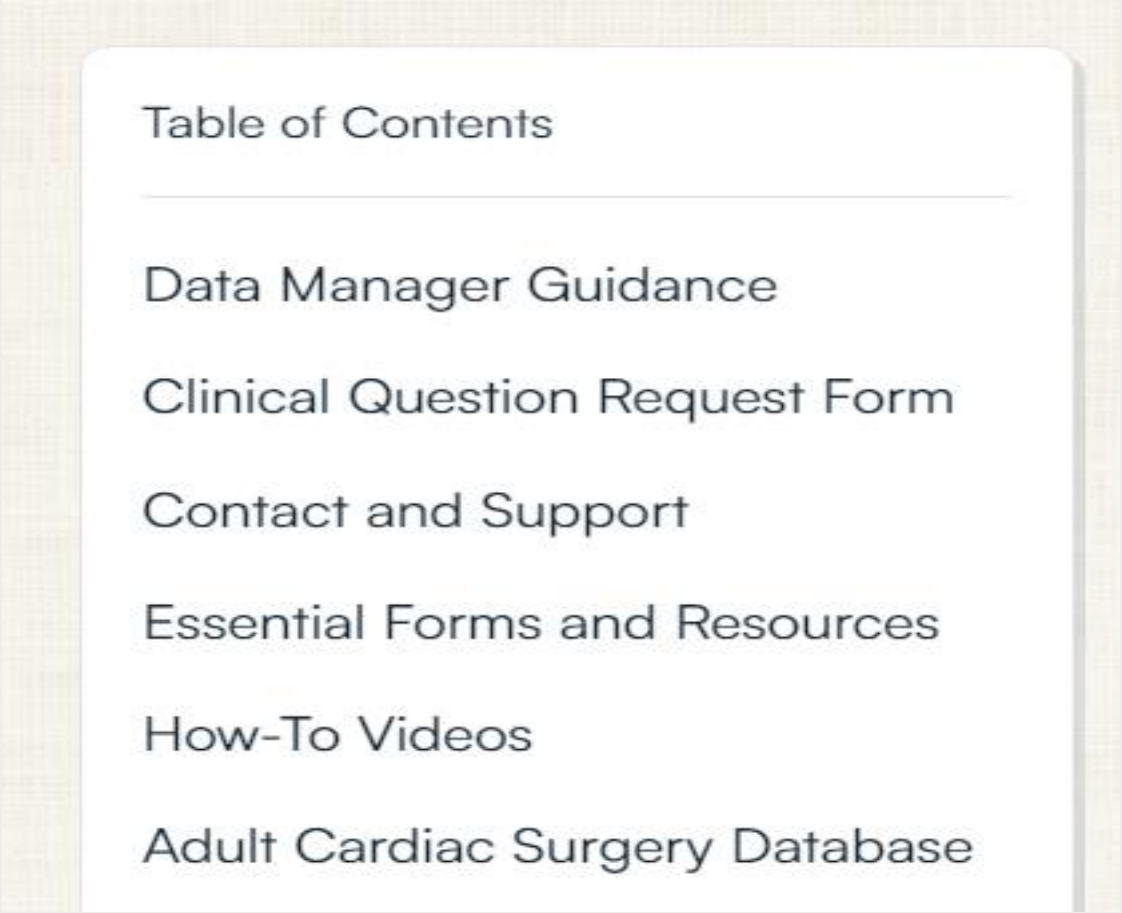
STS National Database Website



STS National Database Website



Data Manager Resources



STS Mentorship Program

Data Manager Guidance

Data Manager Mentorship Program

The STS National Database mentorship program pairs experienced data managers with those who are seeking advice related to data abstraction. After filling out a questionnaire, potential mentors and mentees will be matched based on Database type, experience in specific areas, and other factors.

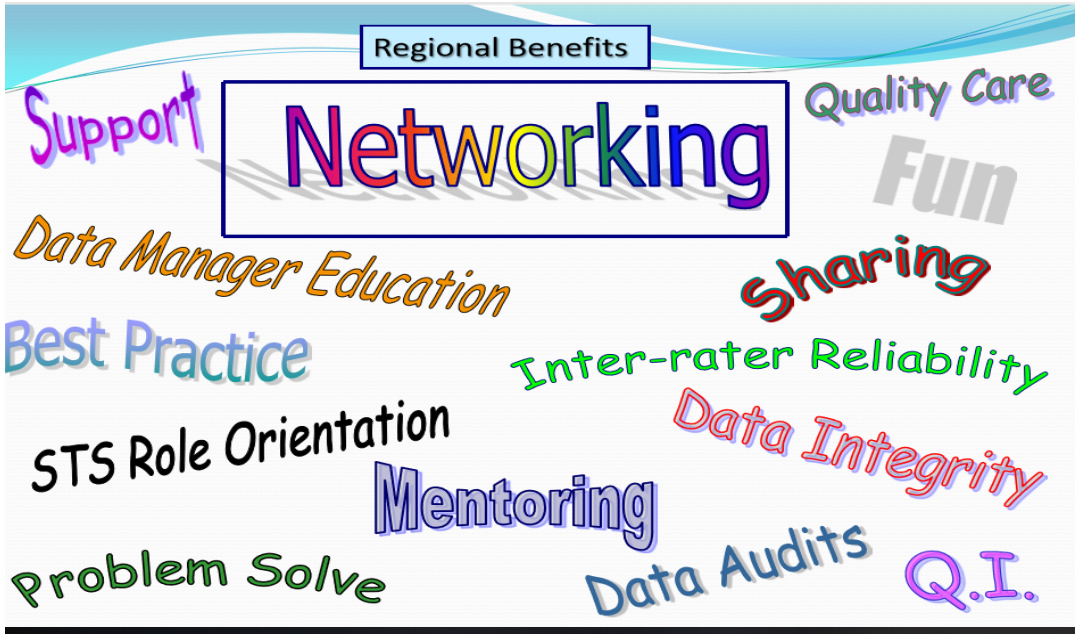
Apply as either a mentor or mentee. You will be notified once you have been matched.

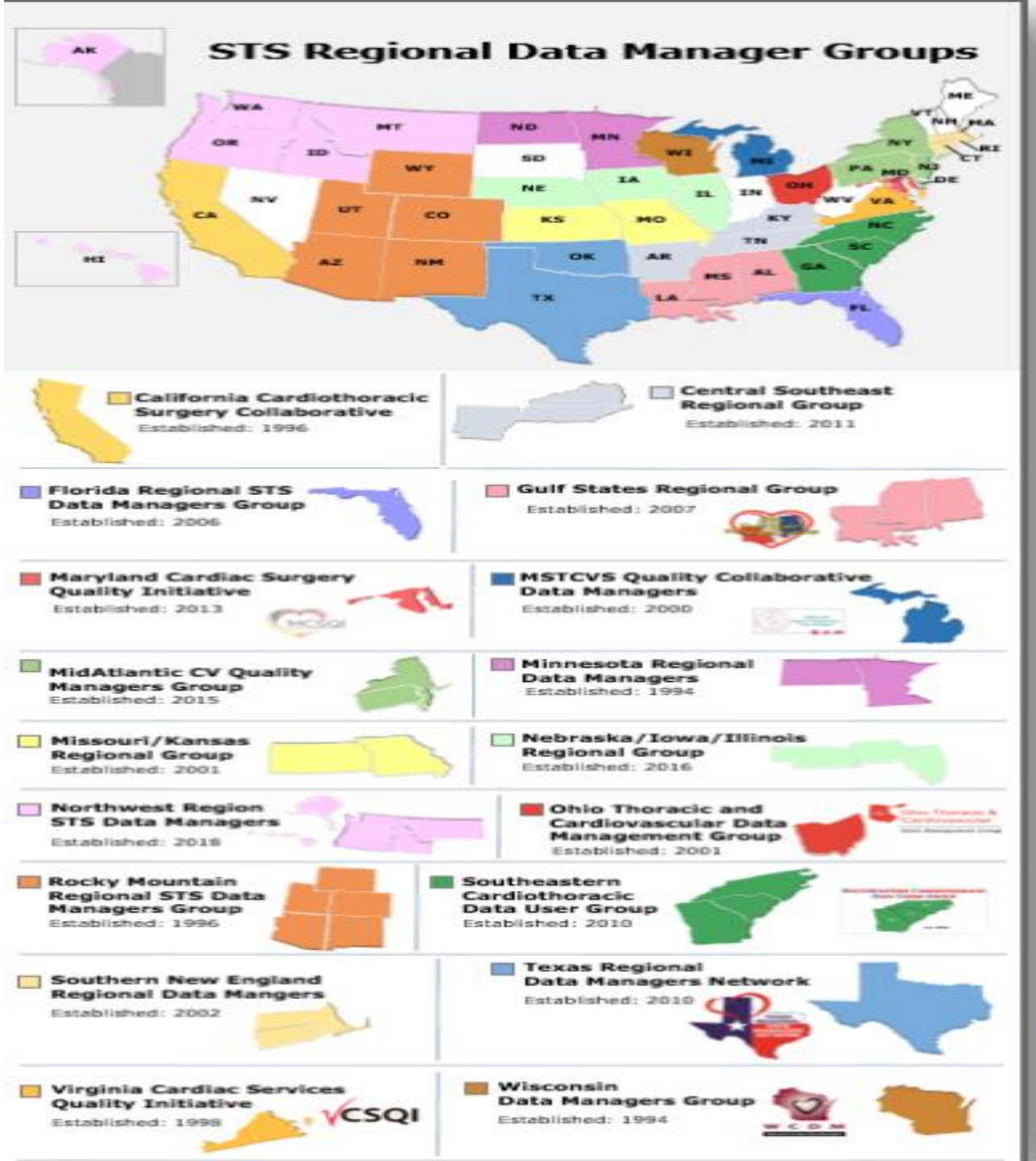
If you have questions about the program or any feedback on the sign-up forms, contact National Database Coordinator Adelaide Dolan.

Data Manager Guidance

Regional Groups

STS National Database regional groups offer a collaborative networking environment for peer-to-peer support and non-clinical guidance related to data abstraction. Learn more.





Data Manager Guidance

STS National Database News

This monthly e-newsletter offers news and updates about the STS National Database. STS data managers and surgeon participants receive a free subscription, which includes updates for each registry in which they participate.

May 2024

Quick Links
ACSD Update
GTSD Update
CHSD Update
Intermacs/Pedimacs Update

This bimonthly e-newsletter offers news and updates about the STS National Database, with a separate issue for each of the four registries. STS data managers receive a free subscription for each registry in which they participate.

Note: All Primary and Backup Data and File Contacts, Surgeon Participants, Data Quality Report Recipients, and National Report Recipients are already on the email list for this newsletter.

https://www.sts.org/subscribe-sts-national-database-news

Frequently Asked Questions - FAQ

Clinical Question Request Form

Are you struggling with a clinical question regarding data abstraction? Fill out the Clinical Question Request Form and get a response within 30 days.

Submit a Request

Ask a Clinical Question

Full Name *

Email *

Phone *

Please put in a phone number

Participant ID #

Database Version *

- Select -

State/Province *

- Select -

Sequence # (Numbers and Letters Only): *

Important only numbers and letters

Short Field Name:

IMPORTANT: FOR HIPAA COMPLIANCE PURPOSES, PLEASE NOTE THAT ANY PATIENT IDENTIFYING INFORMATION[1] SHOULD BE REDACTED FROM THIS SUBMISSION.

Contact and Support

Contact and Support

STS is available to help you with questions regarding the STS National Database.

If you have specific questions regarding the platform or participant reports, contact the STS National Database helpdesk. You will receive a helpdesk ticket, and STS will aim to follow up with you within 2 business days. Note: Heavy call and email volumes are anticipated as harvest deadlines approach. We appreciate your patience.

For general questions (like invoicing, updating contacts, or harvest schedules), contact the STS National Database staff team. For public reporting questions, contact STS Public Reporting.

Contact Helpdesk

STS National Database Forms

Essential Forms and Resources

- Database participant role descriptions
- Database participant and platform roles
- Participant contact form
- Schedule A
- Schedule B
- Database software and vendors
- STS National Database audits *(login required)*
- List of mortality status fields
- STS/IQVIA uploader instructions
- ACSD Data Manager Survey Results 2023
- Minor data requests for quality improvement
- CHSD DM Survey 2023
- GTSD DM Survey 2023
- Intermacs DM Survey 2023

STS National Database Audits

STS National Database audits are designed to complement internal quality controls by examining the accuracy, consistency, and completeness of the data collected within the Database. Ten percent of participating sites in each component database have been selected for independent audits in 2023.

Review the STS National Database Audit Policy.

If you have questions regarding the audit process, contact Emily Conrad, STS National Database and Patient Safety Manager, via email or at 312-202-5839.

Adult Cardiac Surgery Database

Healthcare Management Solutions, LLC (HMS) has been contracted by STS to conduct the STS Adult Cardiac Audit. This will be a remote audit. Please find attached audit instructions.

2023 ACSD Audit Instructions

Instructional Video

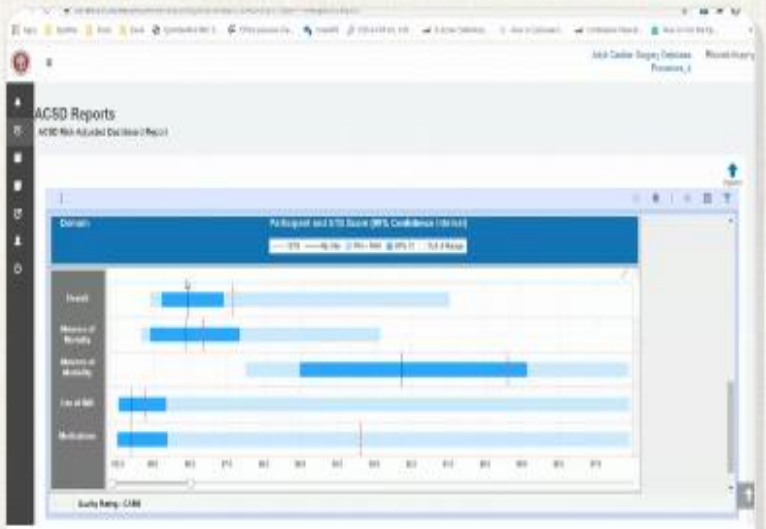
Congenital Heart Surgery Database

General Thoracic Surgery Database

Intermacs Database

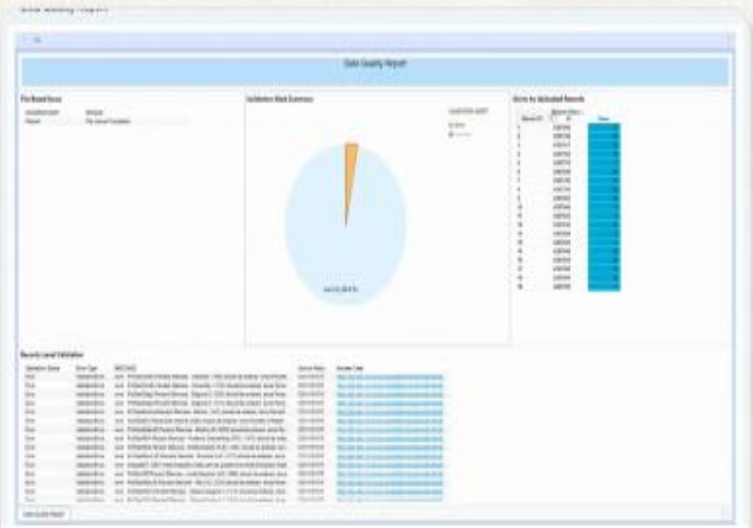
Pedimacs Database

How-To Videos



ACSD Risk Adjusted Dashboard Report

IQVIA Registry Dashboard - General Navigation Training



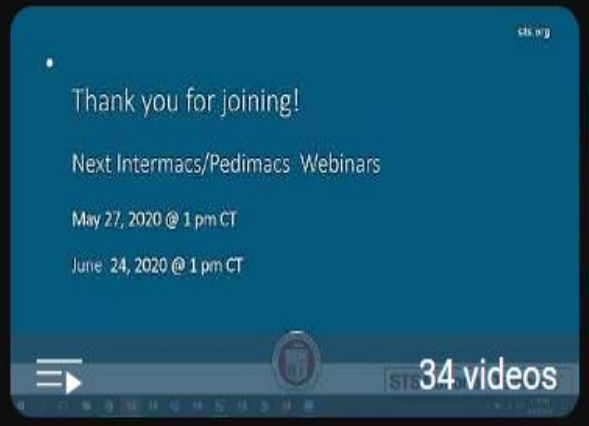
IQVIA Uploader and DQR Review

STS National Database YouTube Channel

HOME VIDEOS **PLAYLISTS** COMMUNITY CHANNELS ABOUT

Created playlists

Sort by



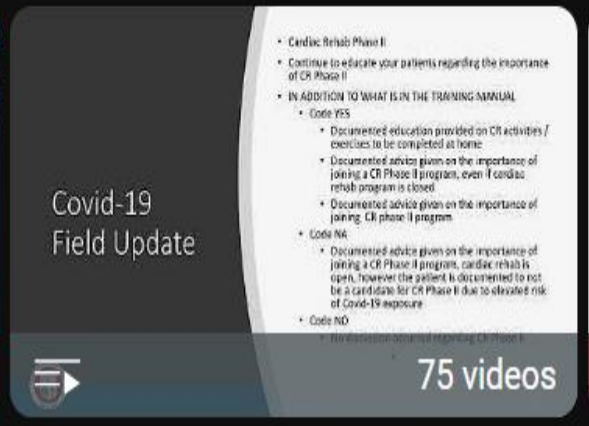
Intermacs/Pedimacs Live Webinars

View full playlist

GTSD Live Webinars

Updated yesterday

View full playlist



ACSD Live Webinars

View full playlist

CHSD Live Webinars

Updated yesterday

View full playlist

ACSD Webinars

ACSD Monthly Webinar

June 5 at 3 p.m. ET • 2 p.m. CT

Call In: 888-475-4499 or 312-626-6799
Webinar ID: 839 336 582
International Dial-in Numbers

Join Webinar

ACSD New Data Manager Webinar

June 13 at 3 p.m. ET • 2 p.m. CT
(two hours)

Call In: 888-475-4499 or 312-626-6799
Webinar ID: 9994 011 3567

International Dial-in Numbers

Join Webinar

Most Recent ACSD Webinars

View Webinar Recording

View Slides - ACSD QI Series, Frailty - April 17, 2024

View Slides - ACSD Monthly Webinar: Frailty Data Collection (April 3, 2024)

View Slides - ACSD Monthly Webinar - March 6, 2024

View Slides - ACSD QI Series, Beta Blockers - February 21, 2024

View Past ACSD Webinars

This will also take you to the STS YouTube Channel

Not receiving notices about weekly webinars? Add your name to the interest list.

Guide to Using STS Risk Adjustment Locally.

O/E = (percent observed events ÷ 'expected' percent events) x O/E Ratio re-calibration multiplier.

The O/E Ratio calibration multipliers for the most recent 3 years can be found on the website.

The choice of the appropriate O/E multiplier depends upon the time-period of the procedures for which the O/E Ratio has been calculated.

ACSD Harvest Deadlines

Note: If you have changed software vendors since you last harvested data to the STS Data Warehouse, or if your 10-digit Hospital NPI number or Hospital Name has changed, complete the Participant Contact Form to make these updates prior to your data submission. Or complete the harvest opt-out form, if necessary.

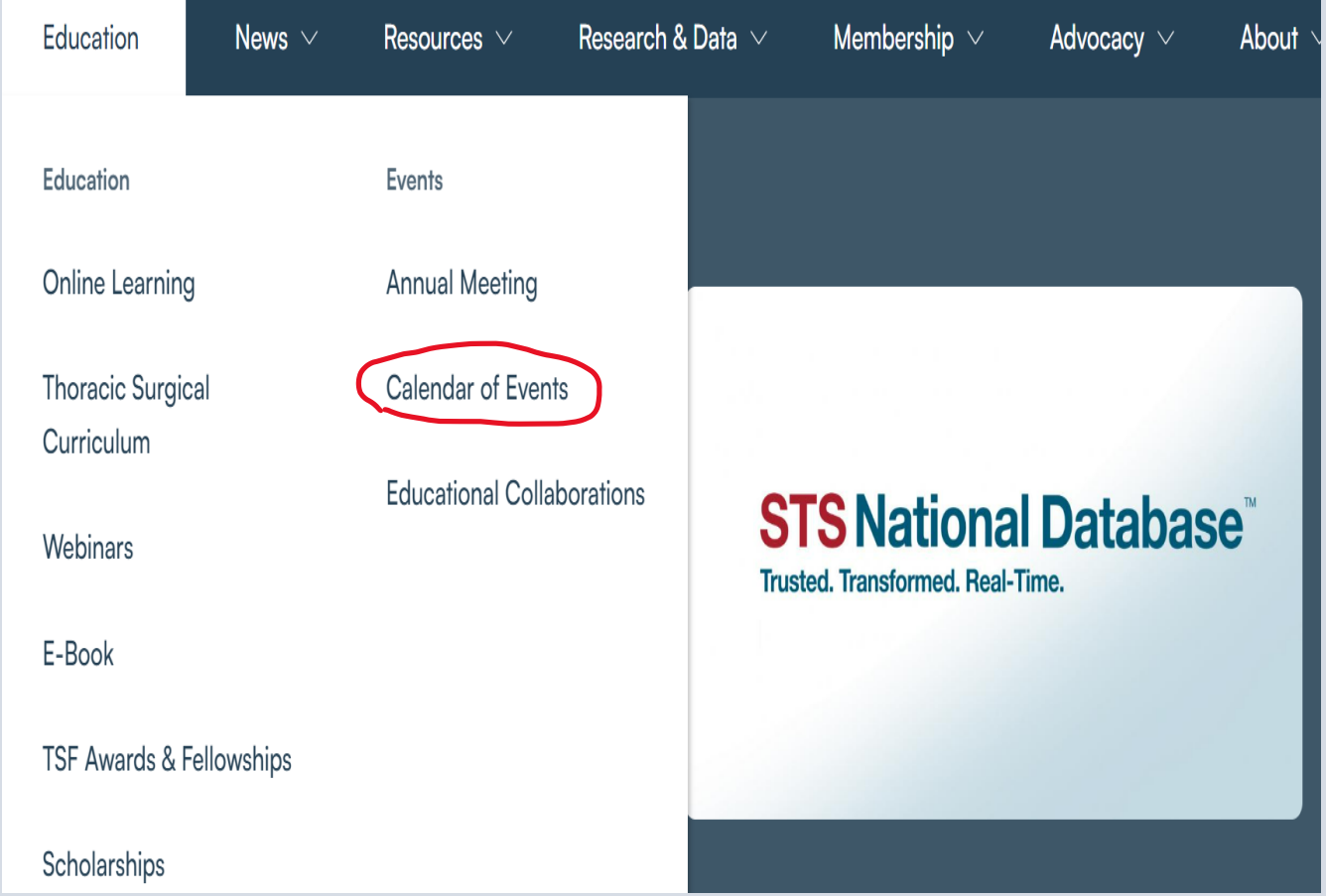
2024 Harvest

Term	Harvest Submission Window Close	Opt-Out Date	Includes Procedures Performed Through:	Report Posting	Comments
Harvest 1	2/23/2024	2/27/2024	12/31/2023	Spring 2024	Star Rating
Harvest 2	6/7/2024	6/11/2024	3/31/2024	Summer 2024	
Harvest 3	8/23/2024	8/27/2024	6/30/2024	Fall 2024	Star Rating
Harvest 4	11/22/2024	11/26/2024	9/30/2024	Winter 2024	

Data Submission Open is continuous for all harvest terms. Submission Close occurs at 11:59 p.m. Eastern on the date listed.

IQVIA Uploader and DQR Review

STS National Database YouTube Channel



Advances in Quality & Outcomes: A Data Manager Meeting (AQO)

Event

2024 Advances in Quality & Outcomes: A Data Managers Meeting

Discussions on valuable research and important clinical findings with the goal of improving data collection and patient outcomes.

Sep 11—13, 2024

Nashville, TN

Adult Cardiac Surgery Database

The ACSD data collection forms and training manual require a participant login. (*If you need assistance with your login credentials, contact STS Member services.)*

Access Data Collection Resources

Access Data Collection Resources (Login Required)

Navigating the STS Website:

Version 4.20

Effective date July 1, 2020

Training Manual - *Updated for June 2024*

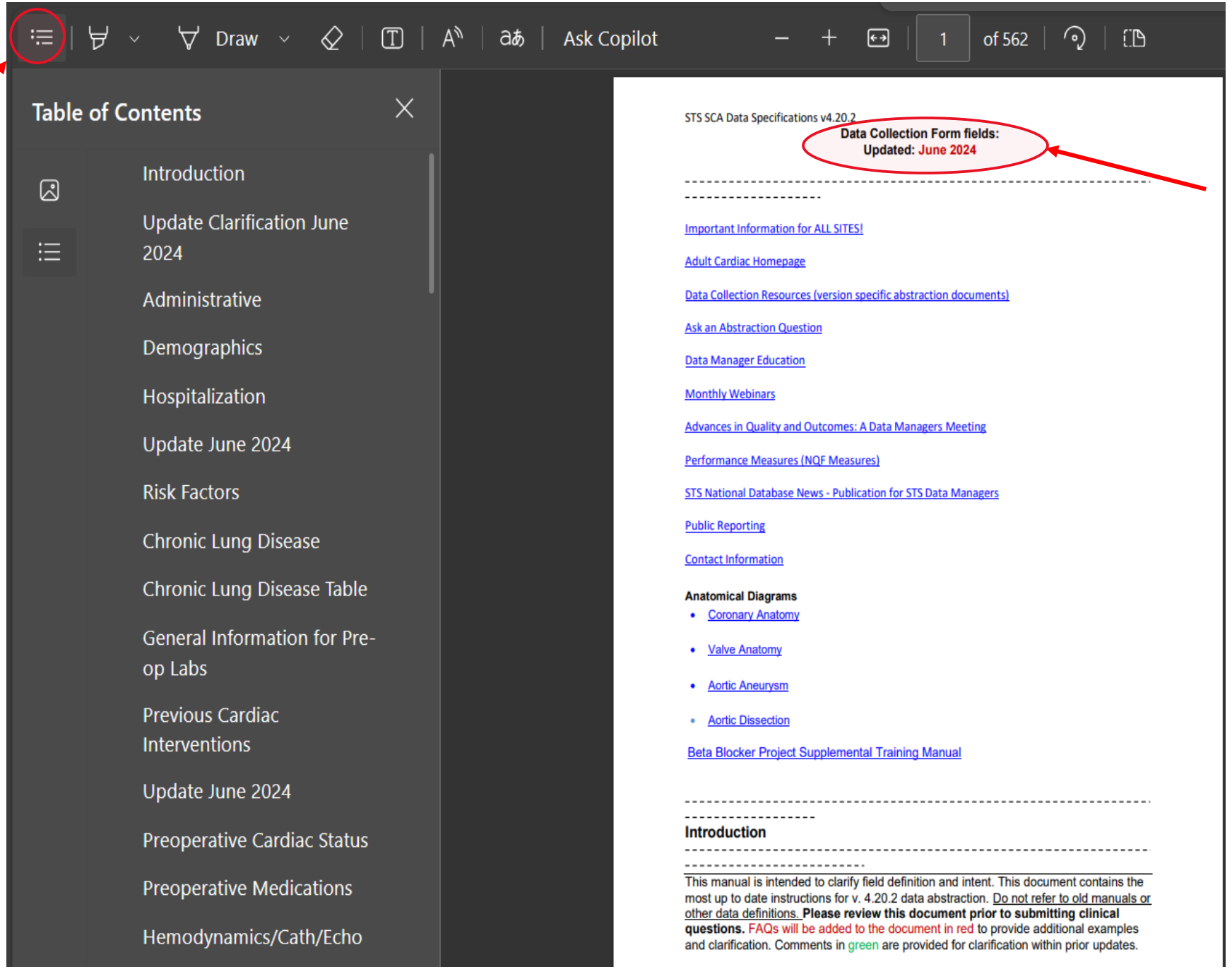
- Training Manual
- FAQ Summary

Data Collection Forms (DCFs)

- ACSD Voluntary Beta Blocker Annotated DCF - updated January 30, 2024
- Word Version - ACSD Voluntary Beta Blocker DCF - updated January 30, 2024
- REDCap Voluntary Beta Blocker Data Collection Link
- REDCap Form for Valve Devices Not Available in Version 4.20.2
- Highlighted and Annotated DCF
- Highlighted and Non-Annotated DCF
- Word Version Highlighted DCF
- Annotated DCF
- Non-Annotated DCF
- Word Version DCF

**To view annotation in Word document DCF versions, select File — Options — Display — Hidden Text — Print Hidden Text, and then click OK. If you need further assistance, please contact your IT Department or do an internet search*

Opens Bookmarks



Updated once a month

STS SCA Data Specifications v4.20.2

Data Collection Form fields:
Updated: June 2024

Important Information for ALL SITES!

Adult Cardiac Homepage

Data Collection Resources (version specific abstraction documents)

Ask an Abstraction Question

Data Manager Education

Monthly Webinars

Advances in Quality and Outcomes: A Data Managers Meeting

Performance Measures (NQF Measures)

STS National Database News - Publication for STS Data Managers

Public Reporting

Contact Information

Anatomical Diagrams

- Coronary Anatomy
- Valve Anatomy
- Aortic Aneurysm
- Aortic Dissection

Beta Blocker Project Supplemental Training Manual

First Page of Training Manual has many links

isolated CABG. If the repair of the fistula is more involved and adds risk to the index procedure, please send a FAQ in to the mailbox for review and coding instructions.

SEQ. #: 2123
Long Name: Aorta Procedure Performed
Short Name: AortProc
Definition: Indicate whether a procedure was performed on the aorta.

Intent/Clarification: The intent is to capture procedures where procedures were performed involving the aorta. Aorta procedures for the purpose of the database refers to actual aorta procedures not stand-alone head or visceral vessels management without an additional aorta or planned staged aorta procedure performed.

Do not code Aortic Root Procedure when the surgeon performs only an annular enlargement with no other aortic root procedure in the aorta section, code this in Section K-1 Aortic Valve Section Seq 3460.

- Yes, planned
- Yes, unplanned due to surgical complication
- Yes, unplanned due to unsuspected disease or anatomy
- No

***If Yes, complete Section M2**

Aortoplasty done in conjunction with AVR to reduce the size of the ascending aorta isconsidered part of the closure and is not coded as an additional procedure. Update May 2021 - Aortoplasty done in conjunction with CABG to reduce the size of the ascending aorta is considered part of the closure and is not coded as an additional procedure. Update March 2022 - Aortoplasty done in conjunction with AVR, or CABG is considered part of the closure and is not coded as an additional procedure. Update Sept 2022 - Aortoplasty done in

Can use the search icon or Control F to search the Training Manual

STS Training Manual

Note: During a follow up phone call, a patient says that they tested positive for COVID-19. In this scenario, code Yes, after discharge within 30 days of surgery for patients who self-report testing positive for COVID-19 within 30 days of surgery. **Update June 2022 This includes self-reported positive home testing kits.**

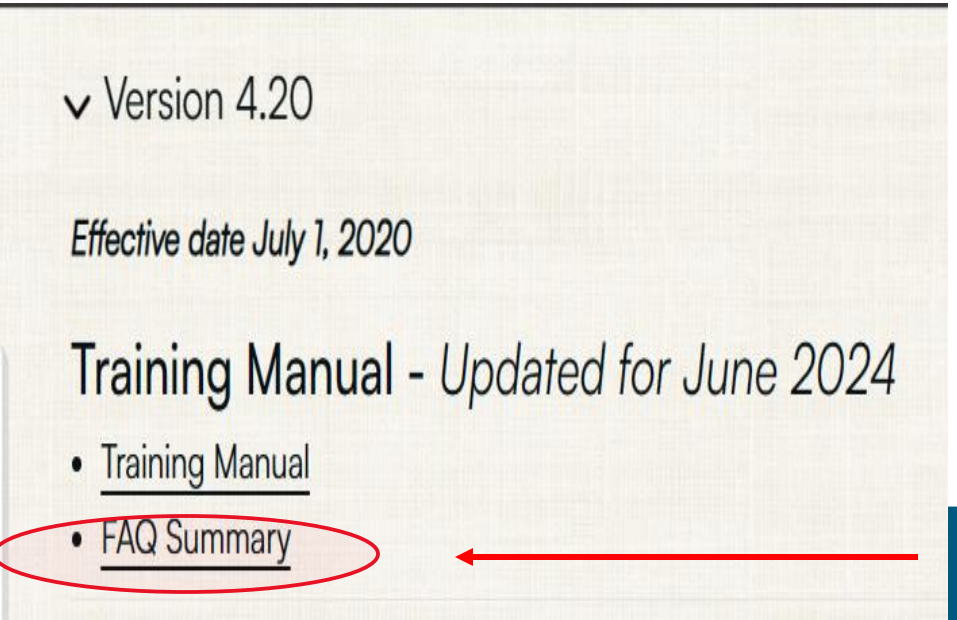
Note: For Temporary Code 11 Yes, prior to hospitalization for this surgery. There is no timeframe for Temporary Code 11. Capture any COVID 19 positive test pre-op and enter the date in SEQ 7225 TempDt.

Note: Temporary Code 10 NO applies to any of the above timeframe's pre-op, during hospitalization, and post-op. For example, if the patient tested negative or was not tested pre-op, then code as NO. If the patient is then tested and is negative or not tested during the hospitalization, code NO. If the patient is discharged and is found to be COVID 19 positive within 30 days of surgery, remove code 10 and code Yes to Code 14.

Update Aug 2021 – Patient says that they tested positive for COVID-19 during the pre-op assessment. In this scenario, code Yes, prior to hospitalization for this surgery (Harvest Code 11) for patients who self-report testing positive for COVID-19. **Update June 2022 This includes self-reported positive home testing kits.**

Update July 2020 - The nasal swab/OP swab, lower resp (RNA) test is the test that weare looking for. The IgG is the antibody test, this is not the test we are looking for.

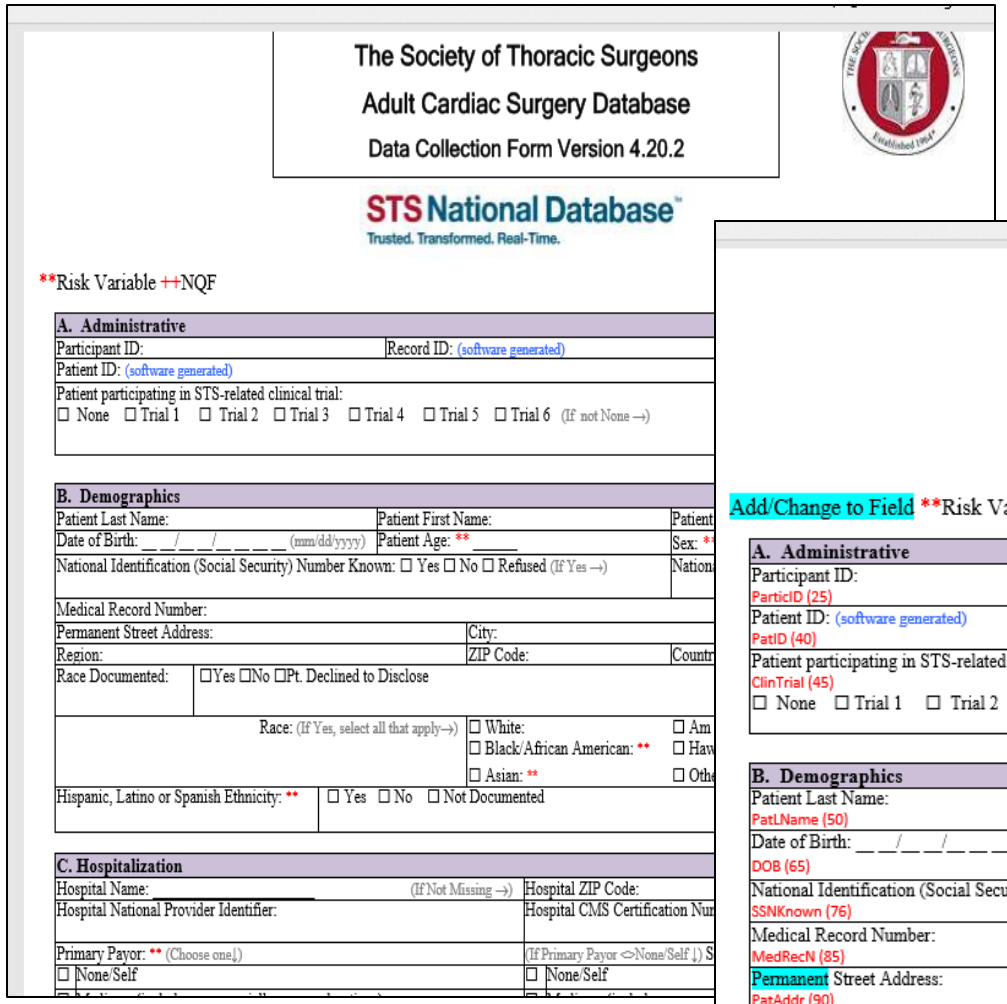
New Updates in Red and older ones in green



Monthly Summary of Training Manual Updates

Data Collection Forms (DCF's)

Non-Annotated DCF



The Society of Thoracic Surgeons

Adult Cardiac Surgery Database

Data Collection Form Version 4.20.2

STS National Database™

Trusted. Transformed. Real-Time.

**Risk Variable ++NQF

A. Administrative

Participant ID: | Record ID: (software generated)

Patient ID: (software generated)

Patient participating in STS-related clinical trial:

☐ None ☐ Trial 1 ☐ Trial 2 ☐ Trial 3 ☐ Trial 4 ☐ Trial 5 ☐ Trial 6 (If not None →)

B. Demographics

Patient Last Name: | Patient First Name: | Patient

Date of Birth: __ __/__ __/__ __ __ __ (mm/dd/yyyy) | Patient Age: ** _____ | Sex: **

National Identification (Social Security) Number Known: ☐ Yes ☐ No ☐ Refused (If Yes →) | Nation

Medical Record Number:

Permanent Street Address: | City:

Region: | ZIP Code: | Countr

Race Documented: ☐Yes ☐No ☐Pt. Declined to Disclose

Race: (If Yes, select all that apply→) ☐ White: ☐ Am ☐ Black/African American: ** ☐ Haw ☐ Asian: ** ☐ Othe

Hispanic, Latino or Spanish Ethnicity: ** ☐ Yes ☐ No ☐ Not Documented

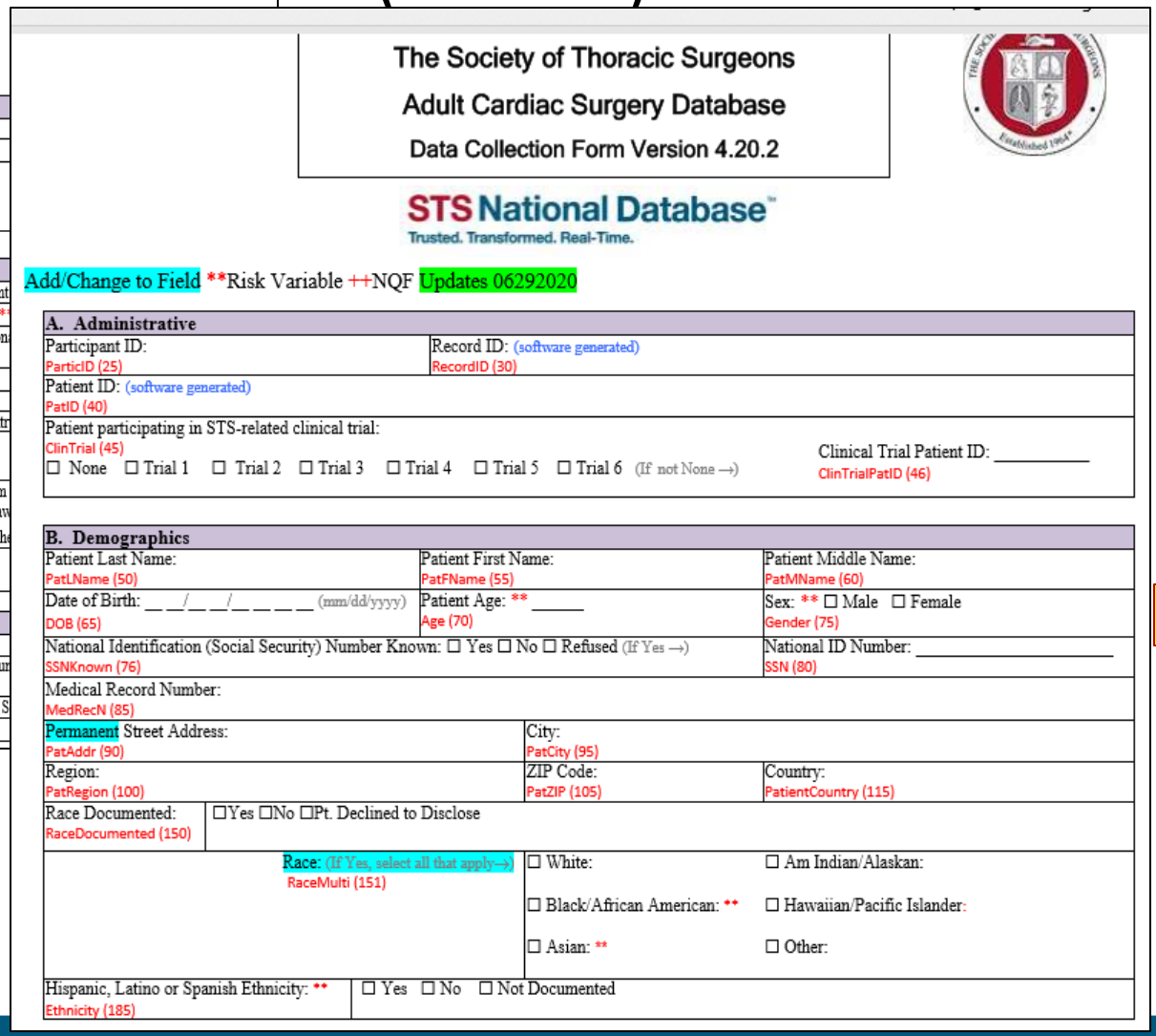
C. Hospitalization

Hospital Name: _____ (If Not Missing →) | Hospital ZIP Code:

Hospital National Provider Identifier: | Hospital CMS Certification Nur

Primary Payor: ** (Choose one↓) | (If Primary Payor <>None/Self ↓) S

☐ None/Self | ☐ None/Self



The Society of Thoracic Surgeons

Adult Cardiac Surgery Database

Data Collection Form Version 4.20.2

STS National Database™

Trusted. Transformed. Real-Time.

Add/Change to Field **Risk Variable ++NQF Updates 06292020

A. Administrative

Participant ID: ParticID (25) | Record ID: (software generated) RecordID (30)

Patient ID: (software generated) PatID (40)

Patient participating in STS-related clinical trial: ClinTrial (45)

☐ None ☐ Trial 1 ☐ Trial 2 ☐ Trial 3 ☐ Trial 4 ☐ Trial 5 ☐ Trial 6 (If not None →) Clinical Trial Patient ID: _____ ClinTrialPatID (46)

B. Demographics

Patient Last Name: PatLName (50) | Patient First Name: PatFName (55) | Patient Middle Name: PatMName (60)

Date of Birth: __ __/__ __/__ __ __ __ (mm/dd/yyyy) DOB (65) | Patient Age: ** _____ Age (70) | Sex: ** ☐ Male ☐ Female Gender (75)

National Identification (Social Security) Number Known: ☐ Yes ☐ No ☐ Refused (If Yes →) SSNKnown (76) | National ID Number: _____ SSN (80)

Medical Record Number: MedRecN (85)

Permanent Street Address: PatAddr (90) | City: PatCity (95)

Region: PatRegion (100) | ZIP Code: PatZIP (105) | Country: PatientCountry (115)

Race Documented: RaceDocumented (150) ☐Yes ☐No ☐Pt. Declined to Disclose

Race: (If Yes, select all that apply→) RaceMulti (151) ☐ White: ☐ Am Indian/Alaskan: ☐ Black/African American: ** ☐ Hawaiian/Pacific Islander: ☐ Asian: ** ☐ Other:

Hispanic, Latino or Spanish Ethnicity: ** Ethnicity (185) ☐ Yes ☐ No ☐ Not Documented

Annotated DCF

Navigating the STS Website:

Surgeon Worksheets - *Updated July 17, 2020*

- Aorta/Open Dissection Worksheet [Word version]
- Aorta/Endo Aneurysm Worksheet [Word version]
- Aorta/Endo Dissection Worksheet [Word version]
- Aorta/Endo Other Worksheet [Word version]
- Aorta/Open Aneurysm Worksheet [Word version]
- Aorta/Open Other Worksheet [Word version]
- Aortic Valve Surgeons Worksheet [Word version]
- Atrial Fibrillation Worksheet [Word version]
- CABG Worksheet [Word version]
- Intraoperative TEE Worksheet [Word version]
- Mitral Valve Worksheet [Word version]
- Tricuspid/Pulmonic Valve Worksheet [Word version]

Navigating the STS Website

Additional Resources - *Updated June 30, 2020*

- Data Specifications v4.20.2
- Software Specifications v4.20.2
- Itemized Changes from v4.20.1 to v4.20.2
- Change Summary v4.20.2
- Itemized Changes v4.20.2
- Procedure Identification Chart (ProcID) - *Updated March 2022*
- Risk Model Variable Chart
- Risk Model Endpoint Chart - *Updated February 2021*
- Congenital Diagnoses and Procedure List
- Case Inclusion Guide
- NQF Endorsed Measures - *Updated August 2021*

› Version 2.9

› Previous Versions

Software Specifications – page 4

Surgery date	Data Specifications
Any dates up to December 31, 1999	Data converted to 2.35 format
January 1, 2000 through December 31, 2001	2.35
January 1, 2002 through June 30, 2002	2.35 or 2.41
July 1, 2002 through December 31, 2003	2.41
January 1, 2004 through December 31, 2004	2.41 or 2.52.1
July 1, 2004 through June 31, 2007	2.52.1
July 1, 2007 through December 31, 2007	2.52.1 or 2.61
January 1, 2008 through June 30, 2011	2.61
July 1, 2011 through June 30, 2014	2.73
July 1, 2014 through June 30, 2017	2.81
July 1, 2017 through June 30, 2020	2.9
July 1, 2020 through current date	4.20.2

- Important Resource to be familiar with
- Dates of Versions

H. Format – The format in which the values for the field should be collected. The options for this field are:

- Date - mm/dd/yyyy: Date values only with the month specified as a 2-digit numeric value, day specified as a 2-digit numeric value, and year specified as a 4-digit numeric value.
- Time - hh:mm (24-hour clock): Time values only with the hours specified as a 2-digit numeric value (in 24-hour format), and the minutes specified as a 2-digit numeric value.
- Date/Time - mm/dd/yyyy hh:mm : Date and time values in one field with the month specified as a 2-digit numeric value, day specified as a 2-digit numeric value, and year specified as a 4-digit numeric value, followed by a single space and then the hours specified as a 2-digit numeric value (in 24-hour format), and the minutes specified as a 2-digit numeric value.
- Integer: Numeric values with no decimal points.
- Real: Numeric values with at least one decimal point.
- Text: Value can contain any alphanumeric characters.
- Text (categorical values specified by STS): Values displayed to the user are the text descriptions defined in the data specifications table. The values submitted to the Data Warehouse are the Harvest Codes defined in the data specifications.
- Text (categorical values specified by user): Values displayed to the user and submitted to the Data Warehouse come from a list maintained by the user (see item "e" under the "3. Data Entry" section of the "Software Specification" below).

I. DataSource – This field defines how the data is entered into the field. The options for this field are as follows (note, in some cases, there is more than one option for data source, such as "User or Calculated"):

- User – The user enters the value, otherwise it is left missing (null).
- Automatic – The software automatically inserts a value for every record. This is usually assigned to administrative fields that must contain a value, such as the DataVrsn field.

Software Specifications – page 6

Describes how to read Data Specs

Software Specs – page 11

- Record ID - unique numeric value that identifies the record in the database.
- Generated Software site by the STS. The codes will be in a format similar to “V01”.
- For example - V01000001

b. Record identification number (RecordID): The RecordID field contains a unique numeric value that identifies the record in the database. This is an arbitrary number and must not be a value that could identify the patient, such as Social Security Number, Medical Record Number, etc. Once attached to a specific record, the value can never be changed, nor can it be reused if the record is deleted. The data warehouse uses the RecordID field to communicate record-specific data quality issues to the participants. Because of this, users must be able to select cases from their database for review using this field and the field must be labeled “RecordID” on the data entry screen. See also the special considerations necessary for this field when importing data from another database in the “Data Import” section, below.

Beginning with version 2.73 of the data specifications, the values generated by the software for the RecordID field must be a combination of a vendor specific code followed by an alphanumeric value that makes the identifier unique. The vendor-specific code will consist of three characters and will be assigned to eac vendor and Participant Generated Software site by the STS. The codes will be a format similar to “V01”. For example, the software will generate a RecordID value of V01000001 for the first record and V01000002 for the second record. The purpose of this feature is to allow sites to move their data from one version of a software package to another, or from one vendor package to another, and maintain the referential integrity of their data records.

Together, the ParticID and the RecordID will affect a composite key, which is unique to each record throughout the national STS database.

Software Specs – page 14

- Points out what data can be imported into Vendor Data Form
- ADT Tool
- Reason we can't import more data is because of the importance of the data managers eyes on the data, the limitations of informatics on writing the correct code, especially when there are changes in definitions and between EMR versions and vendors

4. Importing data from other data sources

Although the data many participants are entering into their STS certified software may be gathered from another electronic data system at their site (such as an EMR), it is strictly against STS policy for vendors to provide the users with the means to import this data automatically. It is not practical for the STS to certify the mapping of data from each site's EMR to the STS data specifications, which would be required to ensure the integrity of the overall STS database.

There are only two exceptions to this policy:

- Unique Device Identification (UDI) numbers can be imported from devices such as barcode readers. This applies to the following fields:
  - Valve Explant Unique Device Identifier (UDI) [ValExpUDI]
  - Second Valve Explant Device Unique Device Identifier (UDI) [ValExpDevUDI]
  - VS-Aortic Proc-Imp - Unique Device Identifier (UDI) [VSAoImUDI]
  - VS-Mitral Proc-Imp-Unique Device Identifier (UDI) [VSMiImUDI]
  - VS-Tricuspid Proc-Imp-Unique Device Identifier (UDI) [VSTrImUDI]
  - Previous VAD Unique Device Identifier (UDI) [PrevVADUDI]
  - VAD-Implant Unique Device Identifier (UDI) [VImpUDI]
  - VAD-Implant Unique Device Identifier (UDI) #2 [VImpUDI2]
  - VAD-Implant Unique Device Identifier (UDI) #3 [VImpUDI3]
  - Other Card-Atrial Appendage Ligation/Exclusion UDI [OCarAAUDI]
- The following demographic data fields can be imported from an Admission/Discharge/Transfer (ADT) system:

LongName	ShortName
Patient Last Name	PatLName
Patient First Name	PatFName
Patient Middle Name	PatMName
Date of Birth	DOB
Patient Age	Age

Software Specs – page 16

5. Field dependencies

Field dependencies exist where one field (the "parent" field) controls whether or not one or more other fields (the "child" fields) can contain data. Child fields are indicated in the specifications by having their immediate parent field named in the "Parent Field" section of their specification. For example, "Cerebrovascular Disease" is a parent field to its child " Prior CVA". The following guidelines must be followed to handle dependent fields:

a. If the data value of a parent field indicates that no data should be in its dependent fields, then those dependent fields should be unavailable on the data entry screen. In the example above, only if "Cerebrovascular Disease"= "Yes" should "Prior CVA" be available for data entry.

b. If a parent field indicates that no data should be in its dependent field, vendors must set all child fields to Null. **Note that in prior versions of the Software Specifications, vendors had the option of setting child field values to "No" provided those fields were set to Null during data extract. This has caused parent/child issues to appear in site data, so this practice is no longer acceptable.**

c. If a parent field is originally set to "Yes", then values can be entered into its child fields. If the record is subsequently edited by the user and the parent value is changed to "No", **the values in the child fields must be automatically changed to Null.**

d. Reporting on missing data values needs to be handled differently in dependent (child) fields, since its meaning depends upon the data value of the parent field. See "Data quality and completeness checks" below for a full description of how this should be handled.

- **Parent Child Relationships**

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- Meld Score Calculation – system calculation must have INR, Total Bili, and Creatinine to calculate

Appendix A: Calculation of MELD scores:

Starting with version 2.73, software must be able to calculate the MELD score for each patient. The results from this calculation are entered by the software into the field RF-MELD Score (MELDScr). The value of this score is calculated using the values entered by the user into the three fields "RF-Total Bilirubin" (TotBlrbn), "RF-INR" (INR), and "RF-Last Creat Level" (CreatLst). The patient's dialysis status (RF-Renal Fail-Dialysis) is also considered in the calculation.

The calculation can be made by creating a "factor" for each of the three variables involved in the score. The value of the variable is used to determine the value of the factor. The factors are then used in a formula to determine the MELD score. The algorithm for determining the value of each factor is as follows:

If RF-Total Bilirubin is >0 and <=1 then bilirubin_factor = 1
otherwise, if RF-Total Bilirubin is >1, then bilirubin_factor = the specified RF-Total Bilirubin value.

If RF-INR is >0 and <=1 then inr_factor = 1
otherwise, if RF-INR is > 1, then inr_factor = the specified RF-INR value.

if RF-Renal Fail-Dialysis=Yes, then creatinine_factor = 4
otherwise, if RF-Last Creat Level is >0 and <=1 then creatinine_factor = 1
otherwise, if RF-Last Creat Level is >1 and <=4, then creatinine_factor = the RF-Last Creat Level value
otherwise, if RF-Last Creat Level is >4, then creatinine_factor = 4

After determining the three factors, the calculation is done using the formula:

MELDScr = (3.8 x Ln([bilirubin_factor])) + (11.2 x Ln([inr_factor])) + (9.6 x Ln([creatinine_factor])) + 6.4

Note that "Ln" refers to the mathematical "natural log" function.

No score should be calculated if any of the following conditions are true:
- RF-Total Bilirubin is missing

Appendix C: Calculation of Total Postoperative Initial Ventilation Hours

Starting with v4.20.2, software must be able to calculate the Total Postoperative Initial Ventilation Hours. The results of this calculation are entered by the software into the field "Total Postoperative Initial Ventilation Hour" (TotalPOInitVentHr). The value of this field is calculated by finding the number of **hours between "OR Exit Date and Time" (ORExitDT) and "Initial Extubation Date And Time" (ExtubateDT).** ~~Value should be stored in decimal format with at least two decimal places. This value is zero for patients extubated in OR or not intubated for procedure (ExtubOR = Yes or N/A (not intubated)).~~

- If either ORExitDT or ExtubateDT are missing, TotalPOInitVentHr is left missing.
- The difference between ORExitDT and ExtubateDT must not be rounded.
- If ExtubOR="Yes" or "N/A", TotalPOInitVentHr must be set to zero.
- Final calculation should include at least two decimal places.

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Appendix F: Field ShortName and SeqNo by DataVrsn.

The following table lists all fields that have been collected in the STS Adult CV Database since 1999. The sequence number (SeqNo) of each field for a given version of the specifications is specified under the version number. If no sequence number is specified, the field was not a Core field for that version of the specifications.

ShortName	2.35	2.41	2.52.1	2.61	2.73	2.81	2.9	4.20.2
AbxDisc				1347	2730	2290	2290	2290
AbxSelect				1345	2710	2280	2280	2280
AbxTiming				1346	2720	2285	2285	2285
AddIntraopPAnti						2295	2295	
ADevDelMeth01							5455	5455
ADevDelMeth02							5480	5480
ADevDelMeth03							5505	5505
ADevDelMeth04							5530	5530
ADevDelMeth05							5555	5555
ADevDelMeth06							5580	5580
ADevDelMeth07							5605	5605
ADevDelMeth08							5630	5630
ADevDelMeth09							5655	5655
ADevDelMeth10							5680	5680
ADevDelMeth11							5705	5705
ADevDelMeth12							5730	5730
ADevDelMeth13							5755	5755

Appendix F: Field Short Name and Seq Number by Data Version

Data Specifications

Long Name: RF-Renal Fail-Dialysis

Short Name: Dialysis

Section Name: Risk Factors

DBTableName Adultdata2

SeqNo: 375

Core: Yes

Harvest: Yes

Definition: Indicate whether the patient is currently (prior to surgery) undergoing dialysis.

Data Source: User

Format: Text (categorical values specified by STS)

Harvest Codes:

Code:	Value:
1	Yes
2	No
3	Unknown

- Integer: Numeric values with no decimal points.
- Real: Numeric values with at least one decimal point.
- Text: Value can contain any alphanumeric characters.

Long Name: INR *SeqNo:* 615

Short Name: **INR** *Core:* Yes

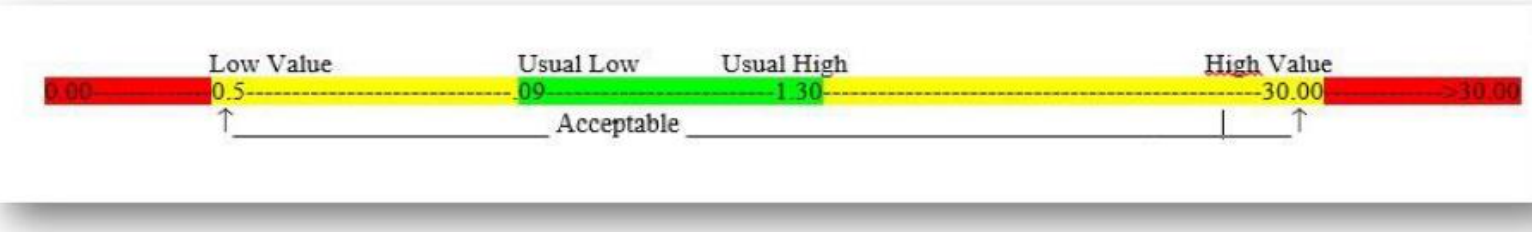
Section Name: Risk Factors *Harvest:* Yes

DBTableName Adultdata2

Definition: Indicate the International Normalized Ratio (INR) closest to the date and time prior to surgery but prior to anesthetic management (induction area or operating room).

Data Source: User *Format:* Real

Low Value: 0.50 High Value: 30.00 UsualRangeLow: 0.90 UsualRangeHigh: 1.30



- Integer: Numeric values with no decimal points.
- Real: Numeric values with at least one decimal point.
- Text: Value can contain any alphanumeric characters.

Data Specifications - Parent Child Relationship

Diabetes: ☐ Yes ☐ No ☐ Unknown (If Yes →) Diabetes-Control: ☐ None ☐ Diet only ☐ Oral ☐ Insulin ☐ Other SubQ ☐ Other ☐ Unknown

Diabetes (360) DiabCtrl (365)

Long Name: RF-Diabetes-Control *SeqNo:* 365

Short Name: **DiabCtrl** *Core:* Yes

ParentShortName: Diabetes

ParentLongName: RF-Diabetes

ParentHarvestCodes: 1

ParentValues: = "Yes"

Procedure ID Chart – Analyzed Cases

- **Isolated Coronary Artery Bypass (CAB)**
- **Isolated Aortic Valve Replacement (AV Replace)**
- **Isolated Mitral Valve Replacement (MV Replace)**
- **Aortic Valve Replacement + CAB (AV Replace + CAB)**
- **Mitral Valve Replacement + CAB (MV Replace + CAB)**
- **Aortic Valve Replacement + Mitral Valve Replacement**
- **Isolated Mitral Valve Repair (MV Repair)**
- **Mitral Valve Repair + CAB (MV Repair + CAB)**

Need to have DCF with Seq Numbers (Annotated DCF) to read this chart

STS Adult Cardiac Surgery Database V4.20.2
Procedure Identification Table

Current as of: 08/13/2020

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	**Isolated CAB (ProcID=1)**	**Isolated AVR (ProcID=2)**	**Isolated MVR** (ProcID=3)**	**AVR + CAB (ProcID=4)**
OpCAB/2120	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy	• No • Yes, unplanned due to surgical complication • Missing	• No • Yes, unplanned due to surgical complication • Missing	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy
OpCAB	OpCAB in(3,5)	OpCab in (NULL, 2,4)	OpCab in (NULL, 2,4)	OpCAB in(3,5)
OpValve/2129	<Not used in this calculation>	• Yes	• Yes	• Yes
OpValve		Opvalve eq 1	Opvalve eq 1	Opvalve eq 1
VSAV/2131	• No • Yes, unplanned due to surgical complication • Missing	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy	• No • Yes, unplanned due to surgical complication • Missing	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy
VSAV	VSAV in (NULL, 2,4)	VSAV in (3,5)	VSAV in (NULL, 2,4)	VSAV in (3,5)
VSAVPr/3395	<Not used in this calculation>	Replacement	<Not used in this calculation>	Replacement
VSAVPr		VSAVPr eq 1		VSAVPr eq 1
VSMV/2133	• No • Yes, unplanned due to surgical complication • Missing	• No • Yes, unplanned due to surgical complication • Missing	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy	• No • Yes, unplanned due to surgical complication • Missing
VSMV	VSMV in (NULL, 2,4)	VSMV in (NULL, 2,4)	VSMV in (3,5)	VSMV in (NULL, 2,4)
VSMVPr/3500	<Not used in this calculation>	<Not used in this calculation>	• Replacement	<Not used in this calculation>
VSMVPr			VSMVPr eq 2	
OCarCongProc1/ 6515	• Missing • PFO, Primary closure • Anomalous origin of coronary artery from pulmonary artery repair • Anomalous aortic origin of coronary artery from aorta (AAOCA) repair	• Missing • PFO, Primary closure	• Missing • PFO, Primary closure • ASD repair, Primary closure • ASD repair, Patch	• Missing • PFO, Primary closure • Anomalous origin of coronary artery from pulmonary artery repair • Anomalous aortic origin of coronary artery from aorta (AAOCA) repair
OCarCongProc1	Ocarcongproc1 in (NULL,10,1291,1305)	Ocarcongproc1 in (NULL,10)	Ocarcongproc1 in (NULL,10,20,30)	Ocarcongproc1 in (NULL,10,1291,1305)

Page 1 with 4 PROC ID categories at the top.

The Gray lines are programming lingo and can be ignored. Focus on the white rows

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	Isolated CAB (ProcID=1)	Isolated AVR (ProcID=2)	Isolated MVR** (ProcID=3)	AVR + CAB (ProcID=4)
VExp3/3985	• Yes, not during this procedure • No • Missing			
VExp3	VExp3 in (NULL, 3, 2)			
OCarLVA/4054	• No • Missing			
OCarLVA	OCarLVA in (NULL, 2)			
OCarAcqVSD/4131	• No • Missing			
OCarAcqVSD	OCarVSD in (NULL, 2)			
AortProc/2123	• No • Yes, unplanned due to surgical complication • Missing			
AortProc	Aortproc in (NULL, 2,4)			
EndovasProc/5066	• No • Missing			
EndovasProc	EndovasProc in (NULL, 2)			
OCarAFibLesLoc/4191	• Epicardial • None • Missing	• Epicardial • None • Missing	<Not used in this calculation>	• Epicardial • None • Missing
OCarAFibLesLoc	OCarAFibLesLoc not in(2,3)	OCarAFibLesLoc not in(2,3)		OCarAFibLesLoc not in(2,3)
OCardASDRep/4136	• No • Missing	• No • Missing	<Not used in this calculation>	• No • Missing
OCardASDRep	OCardASDRep in (NULL, 2)	OCardASDRep in (NULL, 2)		OCardASDRep in (NULL, 2)
OCarACD/4055	<Not used in this calculation>	<Not used in this calculation>	• None • Missing • Pacemaker	<Not used in this calculation>
OCarACD			OCarACD in (NULL, 1, 2)	
OCarACDLE/	• Yes, unplanned due to surgical complication			

On this slide you have procedures that effect all 4 categories and others that effect individual categories

Green Highlights changes from V 2.9 to 4.2

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	Isolated CAB (ProcID=1)	Isolated AVR (ProcID=2)	Isolated MVR** (ProcID=3)	AVR + CAB (ProcID=4)
OCarACDLE/ 4065	• Yes, unplanned due to surgical complication • No • Missing			
OCarACDLE	OCarACDLE in (NULL, 2,4)			
OCarLasr/4110	<Not used in this calculation>	<Not used in this calculation>	• No • Missing	<Not used in this calculation>
OCarLasr			OCarLasr in (NULL, 2)	
OCPulThromDis/ 4052	• No • Missing			
OCPulThromDis	OCPulThromDis in (NULL, 1)			
OCarSubaStenResTy / 4051	• No • Missing • Not Documented			
OCarSubaStenResTy	OCarSubaStenResTy in (NULL, 5,7)			
OCarCrTx/4120	• No • Missing			
OCarCrTx	OCarCrTx in (NULL, 2)			
OCarTrma/4125	• No • Missing			
OCarTrma	OCarTrma in (NULL, 2)			
OCTumor/4115	• No • Missing			
OCTumor	OCTumor in (NULL, 1)			
OCarOthr/4135	• No • Missing			
OCarOthr	OCarOthr in (NULL, 2)			
VSTCV/3400	• No • Missing			
VSTCV	VSTCV in (NULL, 2)			
VSTCVMit/3610	• No • Missing			
VSTCVMit	VSTCVMit in (NULL, 2)			
VSTCVTri/3652	• No • Missing			

PROC ID Chart - How To Read

- **Need Annotated DCF for Short Name and Seq Number**
  - **Note not all seq numbers are on the PROC ID Chart**
- **If you code "No or Missing or Yes, unplanned due to surgical complication" case will stay isolated**
- **Ignore the Gray lines**

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	Isolated CAB (ProcID=1)	Isolated AVR (ProcID=2)	Isolated MVR** (ProcID=3)	AVR + CAB (ProcID=4)

PART 2 (PROCID 5 through 8)				
Variable Short Name	MVR + CAB** (ProcID=5)	AVR + MVR** (ProcID=6)	MV Repair** (ProcID=7)	MV Repair + CAB** (ProcID=8)
AortProc/2123	• No • Yes, unplanned due to surgical complication • Missing			

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	Isolated CAB (ProcID=1)	Isolated AVR (ProcID=2)	Isolated MVR** (ProcID=3)	AVR + CAB (ProcID=4)
OCarAFibLesLoc/ 4191	• Epicardial • None • Missing	• Epicardial • None • Missing	<Not used in this calculation>	• Epicardial • None • Missing
OCarAFibLesLoc	OCarAFibLesLoc not in(2,3)	OCarAFibLesLoc not in(2,3)		OCarAFibLesLoc not in(2,3)

PART 2 (PROCID 5 through 8)				
Variable Short Name	MVR + CAB** (ProcID=5)	AVR + MVR** (ProcID=6)	MV Repair** (ProcID=7)	MV Repair + CAB** (ProcID=8)
OCarAFibLesLoc/ 4191	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>
OCarAFibLesLoc				

PROC ID Chart - How To Read

- **All aorta cases except unplanned due to surgical complication remove the case from isolation***
- **SEQ 4191 A-fib Lesion location is used in the Isolated CAB, Isolated AVR, and Isolated CAB AVR calculation, however it is not used in any of the mitral valve calculations.**

PART 2 (PROCID 5 through 8)				
Variable Short Name	MVR + CAB** (ProcID=5)	AVR + MVR** (ProcID=6)	MV Repair** (ProcID=7)	MV Repair + CAB** (ProcID=8)
	• Anomalous origin of coronary artery from pulmonary artery repair • Anomalous aortic origin of coronary artery from aorta (AAOCA) repair • ASD repair, Primary closure • ASD repair, Patch	• ASD repair, Patch	• ASD repair, Patch	• Anomalous origin of coronary artery from pulmonary artery repair • Anomalous aortic origin of coronary artery from aorta (AAOCA) repair • ASD repair, Primary closure • ASD repair, Patch
OCarCongProc2	Ocarcongproc2 in (NULL,1,10, 20, 30,1291,1305)	Ocarcongproc2 in (NULL,1,10,20,30)	Ocarcongproc2 in (NULL,1,10,20,30)	Ocarcongproc2 in (NULL,1,10, 20, 30,1291,1305)
OCarCongProc3/ 6525	• Missing • No Other Congenital Procedures • PFO, Primary closure • Anomalous origin of coronary artery from pulmonary artery repair • Anomalous aortic origin of coronary artery from aorta (AAOCA) repair • ASD repair, Primary closure • ASD repair, Patch	• Missing • No Other Congenital Procedures • PFO, Primary closure • ASD repair, Primary closure • ASD repair, Patch	• Missing • No Other Congenital Procedures • PFO, Primary closure • ASD repair, Primary closure • ASD repair, Patch	• Missing • No Other Congenital Procedures • PFO, Primary closure • Anomalous origin of coronary artery from pulmonary artery repair • Anomalous aortic origin of coronary artery from aorta (AAOCA) repair • ASD repair, Primary closure • ASD repair, Patch
OCarCongProc3	Ocarcongproc3 in (NULL,1,10, 20, 30,1291,1305)	Ocarcongproc3 in (NULL,1,10,20,30)	Ocarcongproc3 in (NULL,1,10,20,30)	Ocarcongproc3 in (NULL,1,10, 20, 30,1291,1305)
Tricuspid Procedures: VSTV/2134 VSTrPr/3636 VSTrValvec/3683	All tricuspid repairs are allowed. Tricuspid replacements or surgical prosthetic valve intervention – Not explant of valve or Valvectomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrPr: • Repair • Missing AND VsTrValvec	All tricuspid repairs are allowed. Tricuspid replacements or surgical prosthetic valve intervention – Not explant of valve or Valvectomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrPr: • Repair • Missing AND VsTrValvec	All tricuspid repairs are allowed. Tricuspid replacements or surgical prosthetic valve intervention – Not explant of valve or Valvectomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrPr: • Repair • Missing AND VsTrValvec	All tricuspid repairs are allowed. Tricuspid replacements or surgical prosthetic valve intervention – Not explant of valve or Valvectomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrPr: • Repair • Missing AND VsTrValvec

PROC ID Chart - How To Read

For Mitral Cases

- **Tricuspid Procedure Performed (VSTrPr) "Missing or Repair" case will stay isolated. All tricuspid repairs do not affect isolation in mitral cases.**
- **Tricuspid replacements or surgical prosthetic valve intervention – Not explant of valve or Valvectomies will affect case isolation for mitral cases if the procedure is planned or unplanned due to unsuspected anatomy.**

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	**Isolated CAB (ProcID=1)**	**Isolated AVR (ProcID=2)**	**Isolated MVR** (ProcID=3)**	**AVR + CAB (ProcID=4)**

PART 2 (PROCID 5 through 8)				
Variable Short Name	**MVR + CAB** (ProcID=5)**	**AVR + MVR** (ProcID=6)**	**MV Repair** (ProcID=7)**	**MV Repair + CAB** (ProcID=8)**

PrevVADExp/ 3825	• Yes, not during this procedure • No • Missing
PrevVADExp	PrevVADExp in (NULL, 1,3)
VADImpTmg/ 3845	• Pre-Operative (during same hospitalization and prior to OR trip for CV surgical procedure) • In conjunction with CV surgical procedure (same trip to the OR)- unplanned • Post-Operative (after surgical procedure during reoperation) • Missing
VADImpTmg	VADImpTmg in (NULL, 1, 4, 5)
VADImpTmg2/ 3900	• Pre-Operative (during same hospitalization and prior to OR trip for CV surgical procedure) • In conjunction with CV surgical procedure (same trip to the OR)- unplanned • Post-Operative (after surgical procedure during reoperation) • Missing
VADImpTmg2	VADImpTmg2 in (NULL, 1, 4, 5)
VADImpTmg3/ 3955	• Pre-Operative (during same hospitalization and prior to OR trip for CV surgical procedure) • In conjunction with CV surgical procedure (same trip to the OR)- unplanned • Post-Operative (after surgical procedure during reoperation) • Missing
VADImpTmg3	VADImpTmg3 in (NULL, 1, 4, 5)
VExp/3875	• Yes, not during this procedure • No • Missing

PROC ID Chart - How To Read

For VAD placement- All Analyzed Procedures

- **If you code "Yes, not during this procedure, No, Missing, Pre-op during same stay, In conjunction with CV procedure unplanned or Post-op" case will stay isolated.**
- **An Impella of any sort is to be coded as a Temporary Assist Device in SEQ 3786. Do not code an Impella as a VAD.**
- **Temporary Assist Device and ECMO do not affect case isolation. Temporary Assist Device and ECMO timing are in the Risk Model**

Scenario #1

Patient has an AVR with a Nick's annular enlargement which I have coded in Seq 3460. Is the AVR an isolated AVR or it is an AVR plus other procedure? I can't find Seq 3460 on the PROC ID chart.

A. Isolated AVR
B. AVR plus Other

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	Isolated CAB (ProcID=1)	Isolated AVR (ProcID=2)	Isolated MVR** (ProcID=3)	AVR + CAB (ProcID=4)
OCTumor	OCTumor in (NULL, 1)			
OCarOthr/4135	• No • Missing			
OCarOthr	OCarOthr in (NULL, 2)			
VSTCV/3400	• No • Missing			
VSTCV	VSTCV in (NULL, 2)			
VSTCVMit/3610	• No • Missing			
VSTCVMit	VSTCVMit in (NULL, 2)			
VSTCVTri/3652	• No • Missing			

Answer #1

Patient has an AVR with a Nick's annular enlargement which I have coded in Seq 3460. Is the AVR an isolated AVR or it is an AVR plus other procedure? I can't find Seq 3460 on the PROC ID chart.

A. Isolated AVR
B. AVR plus Other

- Seq 3460 is not included in the PROC ID Chart and does not affect case isolation

PART 1 (PROCID 1 through 4)				
Variable Short Name/Seq #	Isolated CAB (ProcID=1)	Isolated AVR (ProcID=2)	Isolated MVR** (ProcID=3)	AVR + CAB (ProcID=4)
OCTumor	OCTumor in (NULL, 1)			
OCarOthr/4135	• No • Missing			
OCarOthr	OCarOthr in (NULL, 2)			
VSTCV/3400	• No • Missing			
VSTCV	VSTCV in (NULL, 2)			
VSTCVMit/3610	• No • Missing			
VSTCVMit	VSTCVMit in (NULL, 2)			
VSTCVTri/3652	• No • Missing			

Scenario #2

Patient has an CABG/MVR with intracardiac Maze which I have coded in Seq 4191. Is the CABG/MVR an isolated CABG/MVR or it is an CABG/MVR plus other procedure?

A. Isolated CABG/MVR
B. CABG/MVR plus Other

PART 2 (PROCID 5 through 8)				
Variable Short Name	MVR + CAB** (ProcID=5)	AVR + MVR** (ProcID=6)	MV Repair** (ProcID=7)	MV Repair + CAB** (ProcID=8)
OCarAcqVSD	OCarAcqVSD in (NULL, 2)			
AortProc/2123	• No • Yes, unplanned due to surgical complication • Missing			
AortProc	Aortproc in (NULL, 2,4)			
EndovasProc/5066	• No • Missing			
EndovasProc	EndovasProc in (NULL, 2)			
OCarAFibLesLoc/ 4191	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>
OCarAFibLesLoc				
OCardASDRep/	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>

Answer #2

Patient has an CABG/MVR with intracardiac Maze which I have coded in Seq 4191. Is the CABG/MVR an isolated CABG/MVR or it is an CABG/MVR plus other procedure?

A. Isolated CABG/MVR
B. CABG/MVR plus Other

- Seq 4191 not used in calculation, so it does not affect case isolation

PART 2 (PROCID 5 through 8)				
Variable Short Name	MVR + CAB** (ProcID=5)	AVR + MVR** (ProcID=6)	MV Repair** (ProcID=7)	MV Repair + CAB** (ProcID=8)
OCarAcqVSD	OCarAcqVSD in (NULL, 2)			
AortProc/2123	• No • Yes, unplanned due to surgical complication • Missing			
AortProc	Aortproc in (NULL, 2,4)			
EndovasProc/5066	• No • Missing			
EndovasProc	EndovasProc in (NULL, 2)			
OCarAFibLesLoc/ 4191	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>
OCarAFibLesLoc				
OCardASDRep/	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>

Additional Resource: Risk Model Variable Chart

- Shows you the variables that are in each Risk Model

- The purpose of risk adjustment is to allow STS database participants to compare their performance with other participants (e.g., overall STS, like participants, region or state). By accounting for and controlling patient risk factors that are present prior to surgery, risk adjustment “levels the playing field” as best as possible.

CABG	Operative Mortality	Stroke	Renal Failure	Prolonged Ventilation	Deep Stern Inf	Reop	Mortality/ Morbidity	Length of Stay>14	Length of Stay<6
B. Demographics									
Age (70)	X	X	X	X	X	X	X	X	X
Gender (75)	X	X	X	X	X	X	X	X	X
RaceBlack (160)	X	X	X	X	X	X	X	X	X
RaceAsian (165)		X	X	X	X	X	X	X	X
Ethnicity (185)		X	X	X	X	X	X	X	X
RaceNativeAm (170)			X	X	X	X	X	X	X
RacNativePacific (175)			X	X	X	X	X	X	X
C.Hospitalization									
SurgDt (310)			X	X	X	X	X	X	X
PayorPrim (291)	X	X	X	X	X	X	X	X	X
PayorSecond (293)	X	X	X	X	X	X	X	X	X
D. Risk Factors									
WeightKg (335)	X	X	X	X	X	X	X	X	X
HeightCm (330)	X	X	X	X	X	X	X	X	X
Diabetes (360)	X	X	X	X	X	X	X	X	X
DiabCtrl (365)	X	X	X	X	X	X	X	X	X
Hct (575)	X	X	X	X	X	X	X	X	X
WBC (565)	X	X	X	X	X	X	X	X	X
Platelets (580)	X	X	X	X	X	X	X	X	X
CreatLst (585)	X	X	X	X	X	X	X	X	X
Dialysis (375)	X	X	X	X	X	X	X	X	X
Hypertn (380)		X	X	X			X		X
InfEndTy (840)					X				

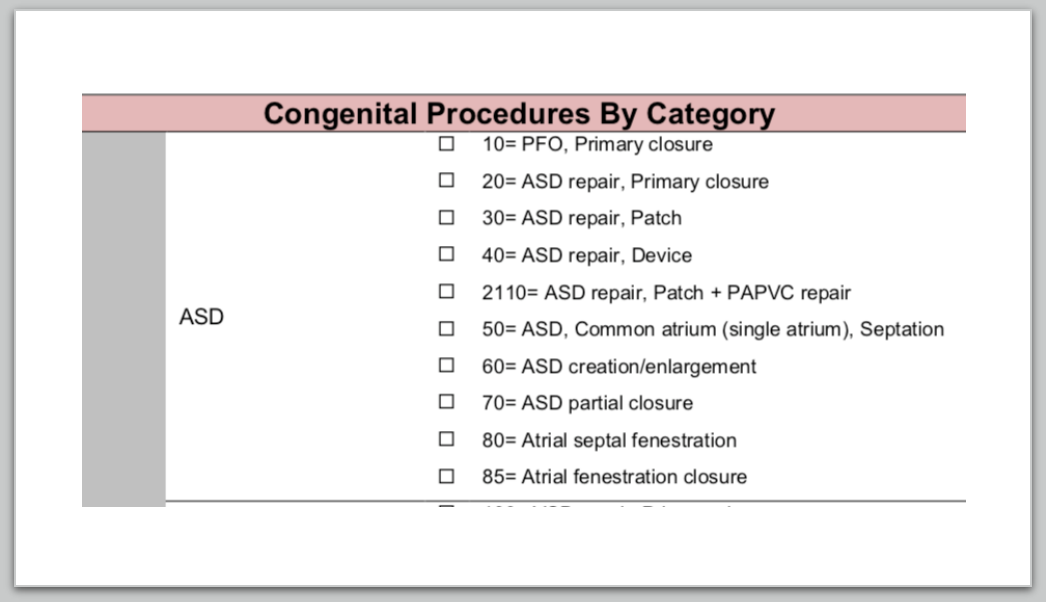
CABG	Operative Mortality	Stroke	Renal Failure	Prolonged Ventilation	Deep Stern Inf	Reop	Mortality/ Morbidity	Length of Stay>14	Length of Stay<6
InfEndo (385)									
ChrLungD (405)	X	X	X	X	X		X	X	X
ImmSupp (490)	X		X	X	X		X	X	X
PVD (505)	X	X	X	X	X	X	X	X	X
CVD (525)	X	X	X	X			X	X	X
CVA (530)	X	X	X	X			X	X	X
CVAWhen (535)	X	X	X	X			X	X	X
CVDTIA (540)	X	X	X	X			X	X	X
CVDStenRt (550)	X	X	X	X			X	X	X
CVDStenLft (555)	X	X	X	X			X	X	X
CVDPCarSurg (560)	X	X		X					X
IVDrugAb (470)				X		X		X	X
Alcohol (480)	X	X	X	X	X	X	X	X	X
Pneumonia (465)			X	X			X	X	X
MediastRad (495)	X			X				X	X
Cancer (500)		X							
TobaccoUse (400)			X	X	X		X	X	X
FHCAD (355)		X	X	X			X	X	X
HmO2 (450)	X			X			X	X	X
SlpApn (460)		X		X			X		X
LiverDis (485)	X		X	X		X	X	X	X
UnrespStat (520)	X	X		X			X		
Syncope (515)	X			X		X	X		X
E. Previous Interventions									
PrCAB (670)	X		X	X	X	X	X	X	X
PrValve (675)			X	X	X	X	X	X	X
PrValveProc1 (695)				X		X	X	X	X

CABG	Operative Mortality	Stroke	Renal Failure	Prolonged Ventilation	Deep Stern Inf	Reop	Mortality/ Morbidity	Length of Stay>14	Length of Stay<6
PrValveProc2 (700)				X		X	X	X	X
PrValveProc3 (705)				X		X	X	X	X
PrValveProc4 (710)				X		X	X	X	X
PrValveProc5 (715)				X		X	X	X	X
POC (805)			X	X	X			X	X
POCInt1 (810)		X	X	X	X		X	X	X
POCInt2 (815)		X	X	X	X		X	X	X
POCInt3 (820)		X	X	X	X		X	X	X
POCInt4 (825)		X	X	X	X		X	X	X
POCInt5 (830)		X	X	X	X		X	X	X
POCInt6 (835)		X	X	X	X		X	X	X
POCInt7 (840)		X	X	X	X		X	X	X
pocpci (775)	X		X			X	X		X
pocpciwhen (780)	X		X			X	X		X
pocpciin (800)	X		X			X	X		X
PrCVInt (665)			X	X		X	X		
F. Preoperative Cardiac Status									
MIWhen (890)	X	X	X	X			X	X	X
HeartFailTmg (912)	X	X	X	X	X	X	X	X	X
ClassNYH (915)	X	X	X	X	X	X	X	X	X
CardSympTimeOfAdm (895)	X		X	X		X	X	X	X
CarShock (930)	X		X	X		X	X	X	X
ArrhythAtrFib (961)	X	X	X	X	X	X	X	X	X
ArrhythAFib (962)	X	X	X	X	X	X	X	X	X
ArrhythAFlutter (960)	X	X	X	X	X	X	X	X	X

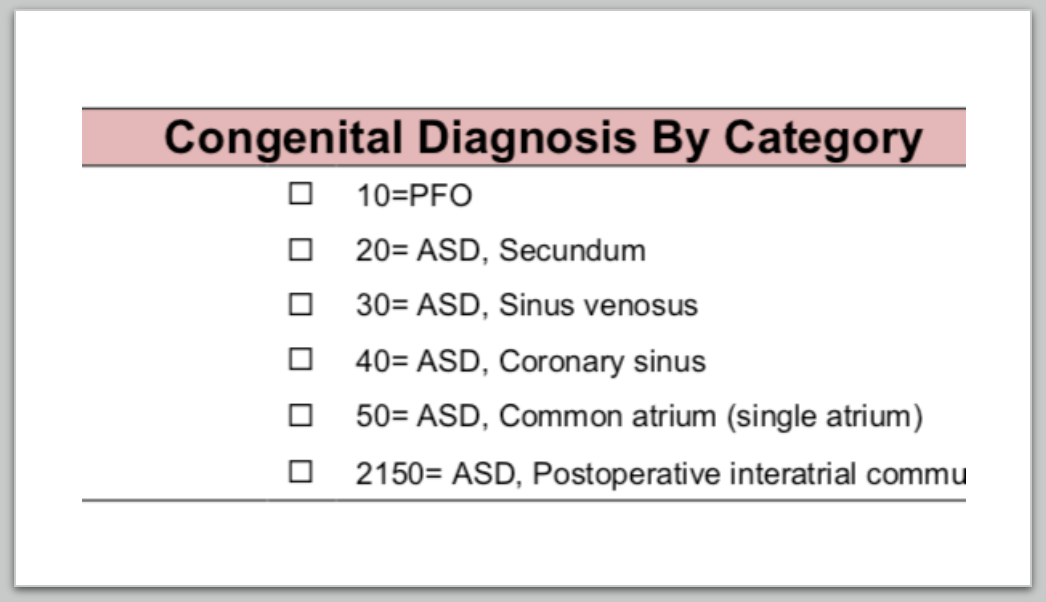
CABG	Operative Mortality	Stroke	Renal Failure	Prolonged Ventilation	Deep Stern Inf	Reop	Mortality/ Morbidity	Length of Stay>14	Length of Stay<6
ArrhythSecond (965)	X			X	X	X	X	X	X
ArrhythSSS (955)	X			X	X	X	X	X	X
ArrhythVV (950)	X			X		X	X	X	X
G. Preoperative Medications									
MedInotr (1130)	X	X	X	X			X	X	X
MedADP5Days (1060)	X	X	X	X		X	X	X	X
MedADPIDis (1065)	X	X	X	X		X	X	X	X
MedSter (1143)	X	X	X	X		X	X	X	X
MedGP (1073)	X	X	X	X		X	X	X	X
Resusc (935)	X	X	X	X	X	X	X	X	X
medacei48 (1020)			X						
H. Hemodynamics and Cath									
NumDisV (1170)	X	X	X	X	X	X	X	X	X
PctStenLMain (1195)	X			X		X	X		
HDEF (1545)	X	X	X	X		X	X	X	X
PctStenPro LAD (1215)		X						X	X
VDStenA (1600)	X					X			
VDStenM (1690)	X		X					X	
VDInsufA (1590)	X	X	X	X		X	X	X	X
VDInsufM (1680)	X		X	X		X	X		X
VDInsufT (1775)	X		X	X		X	X	X	X
VDAoPrimEt (1646)									
I. Operative									
Incidenc (1970)	X		X	X	X	X	X	X	X
Status (1975)	X	X	X	X	X	X	X	X	X

CABG	Operative Mortality	Stroke	Renal Failure	Prolonged Ventilation	Deep Stern Inf	Reop	Mortality/ Morbidity	Length of Stay>14	Length of Stay<6
K. Valve Surgery									
VSTrRepair (3646)					X				
L. Mechanical Cardiac Assist Devices									
IABPWhen (3730) →	X		X	X	X	X	X	X	X
CathBasAssistWhen (3760) →	X		X	X		X	X	X	X
ECMOWhen (3780) →	X		X	X		X	X	X	X

Additional Resources - Congenital Diagnoses and Procedure List



Congenital Procedures By Category	
ASD	☐ 10= PFO, Primary closure ☐ 20= ASD repair, Primary closure ☐ 30= ASD repair, Patch ☐ 40= ASD repair, Device ☐ 2110= ASD repair, Patch + PAPVC repair ☐ 50= ASD, Common atrium (single atrium), Septation ☐ 60= ASD creation/enlargement ☐ 70= ASD partial closure ☐ 80= Atrial septal fenestration ☐ 85= Atrial fenestration closure



Congenital Diagnosis By Category
☐ 10=PFO
☐ 20= ASD, Secundum
☐ 30= ASD, Sinus venosus
☐ 40= ASD, Coronary sinus
☐ 50= ASD, Common atrium (single atrium)
☐ 2150= ASD, Postoperative interatrial commu

Additional Resources – Case Inclusion Guide

STS National Database
Trusted. Transformed. Real-Time.

STS Adult Cardiac Database Inclusion Document

General information – This document is provided to sites to assist in procedure inclusion. **It is not an all-inclusive list. If** your procedure can not be found on the list, please send in a FAQ to determine if the procedure should be included in the Database.

Required Cases in- conjunction with other CV surgery or stand-alone procedure.

1. CABG

2. Valve to include:
    - Aortic valve repair, surgical
    - Aortic valve replacement, surgical
    - Mitral valve commissurotomy, surgical
    - Mitral valve repair, surgical
    - Mitral valve replacement, surgical
    - Tricuspid valve repair, surgical
    - Tricuspid valve replacement, surgical
    - Tricuspid valvectomy
    - Pulmonary valve repair, surgical
    - Pulmonary valve replacement, surgical
    - Pulmonary valvectomy
    - Prosthetic valve repair

3. Aorta - starting above diaphragm, includes dissections to include:
    - Aortic procedure, arch
    - Aortic procedure, ascending
    - Aortic procedure, descending
    - Aortic procedure, root
    - Aortic procedure, thoracoabdominal
    - Aortic Procedure, TEVAR

Additional Resources – NQF Measures

Process Measures:

Preoperative beta blockade therapy
Use of IMA
Discharge anti-platelet medication
Discharge beta blockade therapy
Discharge anti- lipid medication

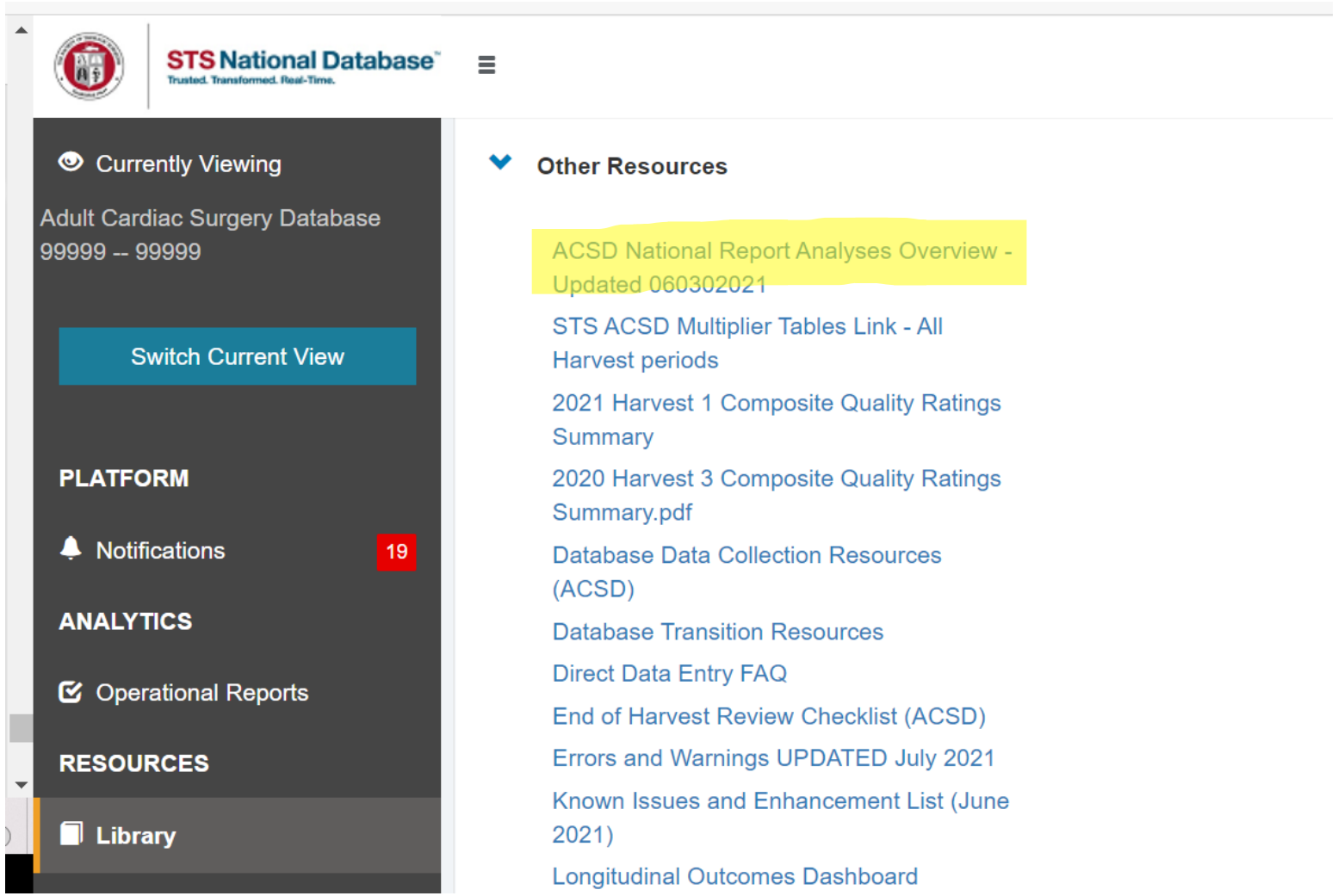
Outcomes Measures:

Post-op Renal Failure
Surgical Re-exploration
Operative Mortality for CABG
Prolonged Ventilation
Deep Sternal Wound Infection
Stroke/Cerebrovascular Accident

Report Overview
STS NQF-endorsed Measures

Title	Description	Numerator	Denominator	Exclusions
Anti-Lipid Treatment at Discharge	Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on a lipid-lowering statin *NOTE: Beginning with data version 2.81 only statins are considered for this measure.*	Number of patients undergoing isolated CABG who were discharged on a lipid-lowering statin Number of isolated CABG procedures in which: Discharge statin medication (DCLipLowStat) is marked "yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Cases are removed from the denominator if there was an in- hospital mortality or if discharge anti-lipid treatment was contraindicated. Mortality Discharge Status (MtDCStat/ DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; Discharge statin medication (DCLipLow Stat) is marked as "contraindicated" Version 4.20.2 Cases are removed from the denominator if there was an in- hospital mortality or Lipid Lowering Statin (DCLipLowStat) is marked contraindicated OR the patient was discharged to Hospice OR the patients discharge location is Left AMA. Expired In OR (ExpiredInOR), Mortality Discharge Status (DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality. Discharge Lipid Lower Statin (DCLipLowStat) is marked 'contraindicated' OR Discharge location (DisLoctn) is' Left AMA' OR Discharge Status (DischMortStat) is Discharged to Hospice

IQVIA Library



Additional Resource – National Report Analysis Overview

Report Overview
Reporting Levels
Participant's Region
Overview of Risk-Adjusted Results
Model Endpoints
Handling of Missing Data
OE Ratio Interpretations
Star Rating
NQF Measures

Missing Data Handling for 2018 Models It is important to understand how missing data values are handled when the STS risk-adjustment models are applied to patients with incomplete data. With the exception of age, missing data values are imputed by assigning a likely substitute value. The algorithm used for missing data imputation is described below:

Required variable: **Age is the only required variable for all models. If it is missing, no value for predicted risk will be calculated**.

Categorical variables: Missing data are generally assumed to have the lowest risk category. For example, if diabetes was not coded, it would be assumed to be "No"; if procedure priority were not coded, the procedure would be assumed to be "Elective." In most cases, the lowest risk category is also the most frequent. If gender is missing, Male gender (the most frequent) is imputed.

Continuous variables: Table 9. Imputation of Missing Continuous Variables shows the values assigned to missing data for continuous model variables

Continuous variables: Table 9. Imputation of Missing Continuous Variables shows the values assigned to missing data for continuous model variables

Ejection Fraction (EF)	If EF is missing or <10%: **CABG Model** If HeartFailTmg is Chronic or missing and gender is Male, set EF = 55% If HeartFailTmg is Chronic or missing and gender is Female, set EF = 58% If HeartFailTmg is Acute or Both and gender is Male, set EF = 40% If HeartFailTmg is Acute or Both and gender is Female, set EF = 45%

Update June 2021 – In the Risk Model, EF values that are less than 10% get imputed to 40%. If your patient has an EF value < 10% enter the EF as 10% in the Database

Complete Chart found in Analysis Overview – page 16-17

Model Variable	Model Imputation Information
Body Surface Area (BSA)	If gender is Male set BSA = 2.00m^2 If gender is Female set BSA = 1.75m^2
Ejection Fraction (EF)	If EF is missing or <10%: **CABG Model** If HeartFailTmg is Chronic or missing and gender is Male, set EF = 55% If HeartFailTmg is Chronic or missing and gender is Female, set EF = 58% If HeartFailTmg is Acute or Both and gender is Male, set EF = 40% If HeartFailTmg is Acute or Both and gender is Female, set EF = 45% **Valve Model** AVR: If HeartFailTmg is Chronic or missing and gender is Male, set EF = 60% If HeartFailTmg is Acute or Both and gender is Male, set EF = 55% If gender is Female, set EF = 60% MV Replace: If HeartFailTmg is Chronic or missing and gender is Male, set EF = 58% If HeartFailTmg is Chronic or missing and gender is Female, set EF = 60% If HeartFailTmg is Acute or Both and gender is Male, set EF = 55% If HeartFailTmg is Acute or Both and gender is Female, set EF = 58%

MV Repair:
If HeartFailTmg is Chronic or missing and gender is Male, set EF = 60%
If HeartFailTmg is Chronic or missing and gender is Female, set EF = 60% If HeartFailTmg is Acute or Both and gender is Male, set EF = 56%
If HeartFailTmg is Acute or Both and gender is Female, set EF = 57%

Valve +CABG Model

AVR+CABG:

If HeartFailTmg is Chronic or missing and gender is Male, set EF = 60%
If HeartFailTmg is Chronic or missing and gender is Female, set EF = 60% If HeartFailTmg is Acute or Both and gender is Male, set EF = 53%
If HeartFailTmg is Acute or Both and gender is Female, set EF = 58%

MV Replace:
If HeartFailTmg is Chronic or missing and gender is Male, set EF = 55%
If HeartFailTmg is Chronic or missing and gender is Female, set EF = 56% If HeartFailTmg is Acute or Both and gender is Male, set EF = 50%
If HeartFailTmg is Acute or Both and gender is Female, set EF = 53%

MV Repair:
If HeartFailTmg is Chronic or missing and gender is Male, set EF = 50%
If HeartFailTmg is Chronic or missing and gender is Female, set EF = 52% If HeartFailTmg is Acute or Both and gender is Male, set EF = 37%
If HeartFailTmg is Acute or Both and gender is Female, set EF = 40%

Last Preop Creatinine	Set CreatLst = 1.0
Last Hematocrit (HCT)	If gender is Male, set HCT = 36.5 If gender is Female, set HCT = 40.0
Last WBC Count (WBC)	If WBC is missing, set WBC = 7.5
Platelets	If platelets is missing, set platelets = 204,000
ADP Inhibitors Discontinuation	If MedADPIDis is missing, set MedADPIDis = 2 Days

STAR Rating - It's not just about you

The participant rating system assigns participants to rating categories designated by one, two, or three stars. The rating categories are defined as follows:

★★★ → Participant performance is significantly higher than STS mean.

★★ → Participant performance is not statistically different from STS mean.

★ → Participant performance is significantly lower than STS mean.

STAR Rating Harvest 1 & Harvest 3

Quality Ratings

Participant score higher than STS score and STS score lower than the site's lowest value in the CI = 3 STARS

Domain	Rating	Participant		STS				
		Score	98% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	97.55%	(96.70-98.22)	96.68%	(91.08-98.92)	95.12%	96.86%	97.98%
Absence of Mortality	★★	97.78%	(96.57-98.65)	97.42%	(92.79-99.19)	96.22%	97.56%	98.44%
Absence of Morbidity	★★★	92.68%	(90.02-94.86)	89.31%	(73.20-96.33)	84.71%	89.79%	93.25%

Participant score higher than STS score and STS score is in the site's CI = 2 STARS

STAR Rating

Data Completeness Requirement: Participants were excluded from the analysis if they had fewer than 10 isolated CABG procedures in the patient population and if they had more than 5% missing data on any of the following 5 NQF-endorsed process measures: use of IMA, preoperative beta blockade therapy, discharge beta blockade therapy; discharge anti-platelet medication; and discharge anti-lipid medication.

There are also thresholds that must be met for mortality fields.

Mortality fields: Mortality is counted as missing for a record if any of the fields below are missing. A value of unknown counts as missing.

a. MtDCStat (Sequence# 5010, Vrsn. 2.81); DischMortStat (Sequence# 7005, Vrsn. 2.9)
b. Mt30Stat (Sequence# 5015, Vrsn. 2.81; Sequence# 7001, Vrsn. 2.9)
c. MtOpD (Sequence# 5025, Vrsn. 2.81; Sequence# 7124, Vrsn. 2.9)

If the percent missing is higher than 10% for year 2015 you are at risk of not receiving a star rating.
If the percent missing is higher than 5% for year 2016 you are at risk of not receiving a star rating.
If the percent missing is higher than 2% for year 2017 or after you are at risk of not receiving a star rating.

Answering Unknown for Mortality = Missing

Current Harvest %Missing Composite Rating

Go To Reports

Current Harvest Missing / Unknown % for Composite Rating

Main Category	Procedure	Year	#Missing	#Eligible	% Percent
Mortality Analysis	Isolated CABG	2021	0	146	0.00
		2022	1	203	0.49
		2023	4	212	1.89
	Isolated AVR	2021	0	69	0.00
		2022	0	85	0.00

- Mortality Analysis includes the following variables: Status at Hospital Discharge, Status at 30 days After Surgery, Operative Mortality
- Outcomes and Process Measures Analysis includes the following variables: Internal Artery Mammary Used, Preoperative Beta Blocker, Discharge Anti-platelet, Discharge Beta Blocker, Discharge Anti-lipid

- In addition to meeting required data completeness thresholds, sites must meet the below case count requirements for the 36-month analytical window to be included into analysis.

Case List

Category	Procedure Group	Surgery Year	Patient ID	Access Case
Mortality Analysis	Isolated CABG	2023	V125718125	https://sts.irp.iqvia.com/platform/acsdregistry/facility/80/case-report-form?patient_id=3936176&rec
Mortality Analysis	Isolated CABG	2023	V125780705	https://sts.irp.iqvia.com/platform/acsdregistry/facility/80/case-report-form?patient_id=3936184&rec
Mortality Analysis	Isolated CABG	2023	V125780117	https://sts.irp.iqvia.com/platform/acsdregistry/facility/80/case-report-form?patient_id=3936186&rec
Mortality Analysis	Isolated CABG	2023	V125742537	https://sts.irp.iqvia.com/platform/acsdregistry/facility/80/case-report-form?patient_id=3936193&rec

Mortality Risk-Adjustment

Outcome		My Site 2019	My Site 2020	My Site 2021*	Like Group 2...	Region 2021	STS 2021
In-hospital Mortality	OR (95% CI) ← Odds Ratio	0.56 (0.30-1.05)	0.65 (0.35-1.20)	0.78 (0.39-1.55)	1.08 (0.89-1.30)	0.93 (0.74-1.17)	1.00 ← STS Eve
	O/E (95% CI) ← OE Ratio	0.30 (0.08-0.85)	0.47 (0.15-1.15)	0.00 (0.00-1.71)	0.97 (0.83-1.11)	0.91 (0.71-1.16)	1.00
	Risk-adjusted Rate (95% CI) ← Risk Adjusted Rate	0.87%	0.00% (0.00-3....	1.96% (1.69-2....	1.85% (1.44-2....	2.03%	
	Observed Rate	-	-	-	-	2.02%	1.99%
Operative Mortality	OR (95% CI)	0.59 (0.34-1.03)	0.73 (0.43-1.24)	0.92 (0.50-1.73)	1.06 (0.90-1.26)	0.89 (0.72-1.10)	1.00
	O/E (95% CI)	0.39 (0.14-0.89)	0.62 (0.27-1.22)	0.73 (0.13-2.49)	0.95 (0.83-1.07)	0.86 (0.69-1.07)	1.00
	Risk-adjusted Rate (95% CI)	0.86%	1.52%	1.94% (0.34-6....	2.51% (2.20-2....	2.29% (1.83-2....	2.66%
	Observed Rate	-	-	-	-	2.58%	2.65%

Comparison of O/E Ratio and Odds Ratio

Because each of these statistics has its advantages, the STS has decided to provide both in the report.

- **OE Ratio: The benefit of O/E Ratios is that they are familiar to many surgeons and are simple to compute using an STS-certified software package.**

- **OR Ratio: The main benefit of Odds Ratios obtained from hierarchical models is that they provide a more reliable estimate of performance for hospitals with a small number of patients.**

O/E Ratio – The Simplified Version

The following table illustrates the possible interpretations of the O/E Ratio.

Table 11. O/E Ratio Interpretations*

Statistic	Interpretation
O/E Ratio > 1	When the O/E Ratio is greater than 1, the participant had an observed outcome level that was greater than expected. The participant performed worse than expected.
O/E Ratio < 1	When the O/E Ratio is less than 1, the participant had an observed outcome level that was less than expected. The participant performed better than expected.
O/E Ratio = 1	When the O/E Ratio is 1, the participant had an observed outcome level equal to expected. The participant performed as expected.

Observed is your site compared to the expected which is computed using the risk models on all sites data.

The interpretations in this table can also be roughly extended to Odds Ratios - values less than 1 imply better than average performance, values of 1 imply average performance and values over 1 imply worse than average performance. Note that the Odds Ratio will generally be closer to 1.0 than the O/E Ratio. It is possible that these two measures will be discrepant, but only if they are close to 1.0.

Understanding Risk Adjustment - The Simplified Version

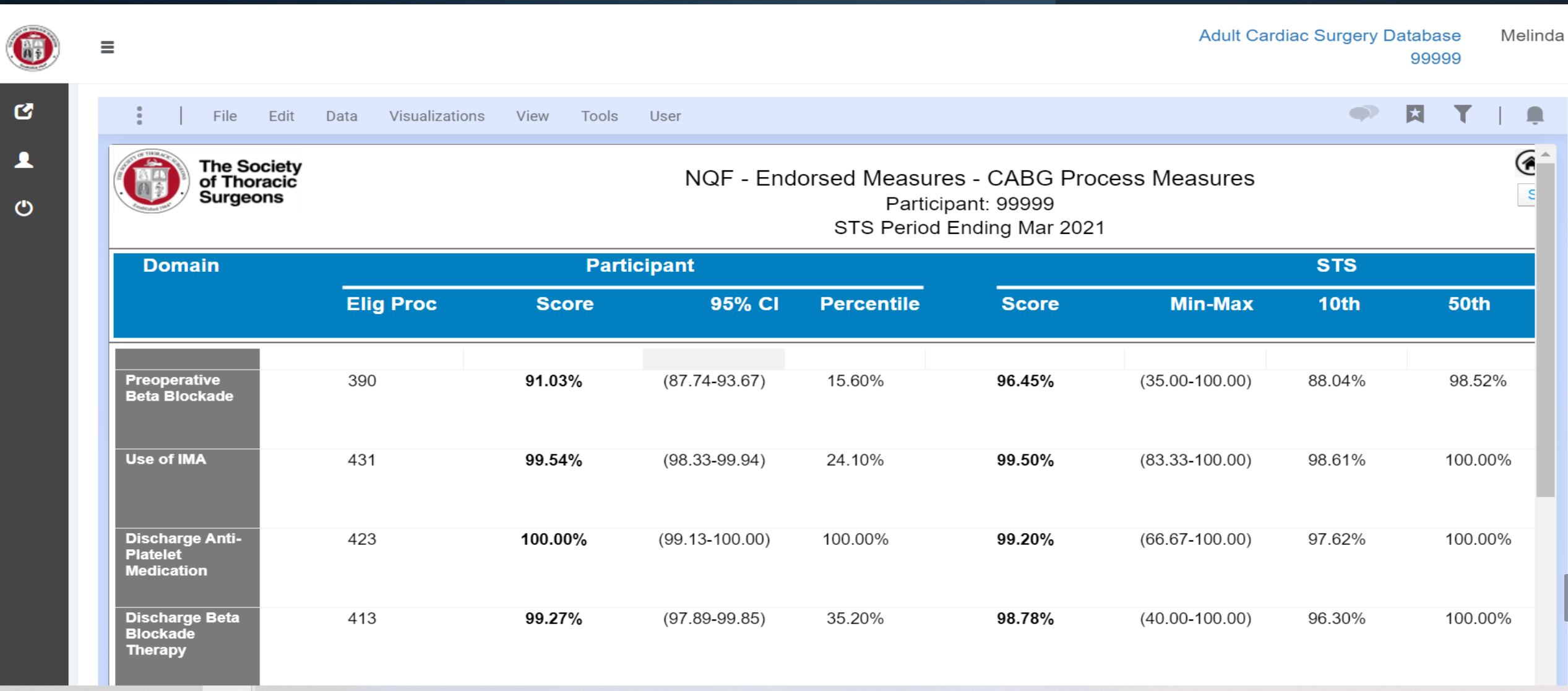
Table 12. Risk-adjusted Rate Interpretations

Statistic	Interpretation
Risk-adjusted rate > STS event rate	When the risk-adjusted rate for a particular adverse outcome is greater than the STS average rate, then the participant had more of those outcomes than expected given their case-mix.
Risk-adjusted rate < STS event rate	When the risk-adjusted rate for a particular adverse outcome is less than the STS average rate, then the participant had less of those outcomes than expected given their case-mix.
Risk-adjusted rate = STS event rate	When the risk-adjusted rate for a particular adverse outcome is equal to the STS average rate, then the participant had the same number of those outcomes as expected given their case-mix.

Quality Rating Details

Quality Domain	Time Period	Eligible Procedures	Detail	*Count	Percent of Morbidity/Failure
Absence of Mortality	Jan 2020 - Dec 2020	457	Mortality	7	
Absence of Morbidity	Jan 2020 - Dec 2020	456	Any Morbidity	25	
			Cerebrovascular Accident only	5	20 %
			Deep Sternal Infection / Mediastinitis Only	1	4 %
			Multiple Morbidities	5	20 %
			Prolonged Ventilation Only	5	20 %
			Renal Failure Only	1	4 %
			Reoperation Only	8	32 %
Use of IMA	Jan 2020 - Dec 2020	450	IMA Failures	2	
Medications	Jan 2020 - Dec 2020	457	Failed to Prescribe All Eligible NQF Endorsed Medications	46	
			Failed to Prescribe Multiple Medications	3	6.5 %

NQF Measures



Adult Cardiac Surgery Database
99999

Melinda O

File Edit Data Visualizations View Tools User

The Society of Thoracic Surgeons

NQF - Endorsed Measures - CABG Process Measures

Participant: 99999

STS Period Ending Mar 2021

Domain	Participant				STS			
	Elig Proc	Score	95% CI	Percentile	Score	Min-Max	10th	50th
Preoperative Beta Blockade	390	**91.03%**	(87.74-93.67)	15.60%	**96.45%**	(35.00-100.00)	88.04%	98.52%
Use of IMA	431	**99.54%**	(98.33-99.94)	24.10%	**99.50%**	(83.33-100.00)	98.61%	100.00%
Discharge Anti-Platelet Medication	423	**100.00%**	(99.13-100.00)	100.00%	**99.20%**	(66.67-100.00)	97.62%	100.00%
Discharge Beta Blockade Therapy	413	**99.27%**	(97.89-99.85)	35.20%	**98.78%**	(40.00-100.00)	96.30%	100.00%

Housekeeping Tips

Keep DCF and or your collection notes for at least 3 years.

Keep a log of 30-Day Mortality / 30 Day Readmission/ 30 Day DSWI & Infection in the event of an Audit.

Please use the Q&A Function.

We will answer as many questions as possible.

We encourage your feedback and want to hear from you!