

STS National Database™

Trusted. Transformed. Real-Time.

The Society of Thoracic Surgeons

Congenital Heart Surgery Database

Analysis Review

June 2, 2026



Agenda

- Welcome and Introduction
- STS Update
- STS Education
 - Analysis Review



Updated Document Postings

Congenital Heart Surgery Database

Table of Contents

- Adult Cardiac Surgery Database
- General Thoracic Surgery Database
- Additional Resources
- Congenital Heart Surgery Database

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The STS Congenital Heart Surgery Database is currently operating under version 6.23.2.

✓ Version 6.23.2

Effective July 1, 2023

Training Manual - Updated as of May 2026

- [Training Manual](#)
- [FAQ Summary](#)

Data Collection Forms (DCFs)

- [Annotated Data Collection Form \(PDF\)](#)
- [Annotated Data Collection Form \(WORD\)](#)

**To view annotation in Word document DCF versions, select File – Options – Display – Hidden Text - then click OK. If you need further assistance, please contact your IT Department or do an internet se version of Office on ways to view hidden text.*

Additional Resources

- [Spring 2026 CHSD Analysis Overview \(includes STS Combo Codes\) – Updated May 22, 2026](#)
- [Data Specifications](#)
- [Itemized Changes from 3.41 to 6.23.2](#)
- [Summary Checklist of Changes from 3.41 to 6.23.2](#)
- [Appendix C: STAT Categories \(WORD\)](#)



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**DATA ANALYSES OF THE SOCIETY OF THORACIC SURGEONS
CONGENITAL HEART SURGERY DATABASE**

Spring 2026 Analysis

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Updated Document Postings

Welcome,
Leigh Ann Jones

Currently Viewing

Congenital Heart Surgery Database
50001 -- 50001

Switch Current View

DASHBOARD

Community Page

PLATFORM

Notifications 14

ANALYTICS

Operational Reports

RESOURCES

Library

Library

National Report Overview, Data Checks, and Opt-Out Form

[CHSD Analyses Overview Updated May 22, 2026](#)

[CHSD Risk Adjusted Report Calculation Resource \(UPDATED May 2026\)](#)

[CHSD Registry Critical Errors/Errors and Warnings List](#)

[End of Harvest Review Checklist](#)

[Missing Variable Report User Guide \(UPDATED 8.5.2022\)](#)

[STS Harvest Opt Out Request Form](#)

Quality Ratings Summary and Multiplier Tables

[Spring 2026 CHSD Harvest Composite Quality Ratings Summary](#)

[Fall 2025 CHSD Harvest Composite Quality Ratings Summary](#)

[Spring 2025 Harvest Composite Quality Ratings Summary](#)

[Fall 2024 Harvest Composite Quality Ratings Summary](#)

[Spring 2024 CHSD Harvest Composite Quality Ratings Summary](#)

[Fall 2023 Harvest Composite Quality Ratings Summary](#)

[Spring 2023 Harvest Composite Quality Ratings Summary](#)

[Fall 2022 CHSD Harvest Composite Quality Ratings Summary](#)

Report Definitions:			
NOTE: gender(1,2) is no longer applicable starting with the Fall Harvest 2023 report			
Category	Calculation Name	Calculation	
Number of Operations/Patients	Operations Submitted	all Operations	
Number of Operations/Patients	CPB Cardiovascular + No CPB Cardiovascular Operations Submitted	ioptype = 1 or ioptype = 2 and include = 1 and mortdata = 1	
Number of Operations/Patients	Identified Index Operations	ioptype = 1 or ioptype = 2 and PrimaryOp = 1 and include = 1 and mortdata = 1	
Number of Operations/Patients	Operations with a STAT Mortality Score Eligible for Analysis	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and include = 1 and mortdata = 1 and statmodel = 1	
Number of Operations/Patients	Current Analysis Exclusions	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and include = 1 and mortdata = 1 and statmodel = 1	
Operative Mortality	Number Eligible	ioptype = 1 or ioptype = 2 and PrimaryOp = 1 and Opmort is not null and MortExclude = 0 and Include = 1 and mortdata = 1	
STAT Mortality	STAT Mortality Category	ioptype = 1 or ioptype = 2 and PrimaryOp = 1 and Opmort = 1 and MortExclude = 0 and STATMortLevel = x and Include = 1 and mortdata = 1	
Operative Mortality	Mortality Rate	(Number of Mortalities/Number Eligible)	
			Category:
STS/Participant/Both	Category	Calculation Name	Variables
Both	Number of Operations/Patients	Operations Submitted	all Operations
Both	Number of Operations/Patients	CPB Cardiovascular + No CPB Cardiovascular Operations Submitted	ioptype = 1, ioptype = 2 and Include = 1 and mortdata = 1
Both	Number of Operations/Patients	Identified Index Operations	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and include = 1 and mortdata = 1
Both	Number of Operations/Patients	Operations with a STAT Mortality Score Eligible for Analysis	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and include = 1 and mortdata = 1 and statmodel = 1
Both	Number of Operations/Patients	Current Analysis Exclusions	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and include = 1 and mortdata = 1 and statmodel = 1
Both	Operative Mortality	Number of Mortalities	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and Opmort = 1 and MortExclude = 0 and Include = 1 and mortdata = 1
Both	Operative Mortality	Number Eligible	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and Opmort is not null and MortExclude = 0 and Include = 1 and mortdata = 1
Both	Operative Mortality	Mortality Percent	Number of Mortalities/Number Eligible
Both	Operative Mortality	Mortality (95% CI)	95% CI (calculation performed in spotfire)
Both	STAT Mortality Category 1	Number of Mortalities	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and Opmort = 1 and MortExclude = 0 and Include = 1 and mortdata = 1 and STATMortLevel = 1
Both	STAT Mortality Category 1	Number Eligible	ioptype = 1, ioptype = 2 and PrimaryOp = 1 and Opmort is not null and MortExclude = 0 and Include = 1 and mortdata = 1 and STATMortLevel = 1
Both	STAT Mortality Category 1	Mortality Percent	Number of Mortalities/Number Eligible
Both	STAT Mortality Category 1	Mortality (95% CI)	95% CI (calculation performed in spotfire)

Jul 2016 - Jun 2017
calculate for both
STS and Participant
Jul 2016 - Jun 2017

Education Discussion Topics

Spring 2026 Analysis Report Updates

Spring 2026
CHSD
Analysis
Report
Updates

Topic Review

- Updated examples for Overlapping EOC
- Changes to Tables 1 and 7
 - Background
 - Line by line review
- Note to Table 16
- Inclusion change Table 17

Overlapping EOC

Rules for Identifying Episodes of Care

The unit of analysis for mortality analyses in the feedback report is an episode of care.

For 3.41, and 6.23.2 an episode of care will consist of all operation records with the same database discharge date.

If an episode of care does not contain at least one Cardiovascular Surgical Operation as defined above, then this episode of care will not be included in mortality analyses and will be ignored in the report logic described below. Thus, the term "episode of care" will refer to an episode of care with at least one Cardiovascular Surgical Operation.

If a patient has two overlapping episodes of care, as defined by two index operations occurring within 30 days of one another, then the first index operation will be analyzed. Subsequent index operations will be ignored in the report logic as described below.

Overlapping EOC – Example 1

Admission Date	Date of Surgery	OpType	Index?	Discharge date	Location	DB discharge date	Notes
1/1/2022	2/1/2022	CPB Cardiovascular	Yes	2/28/2022	Home	2/28/2022	EOC 1
3/1/2022	3/1/2022	CPB Cardiovascular	Yes	3/12/2022	Home	3/12/2022	EOC 2

Overlapping EOC – Example 1

Admission Date	Date of Surgery	OpType	Index?	Discharge date	Location	DB discharge date	Notes
1/1/2022	2/1/2022	CPB Cardiovascular	Yes	2/28/2022	Home	2/28/2022	EOC 1
3/1/2022	3/1/2022	CPB Cardiovascular	Yes	3/12/2022	Home	3/12/2022	EOC 2

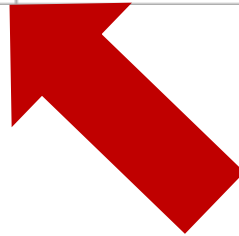
The dates of these two index operations are within 30 days; therefore, this qualifies for the **Overlapping EOC rule** and the SECOND event is excluded (i.e., the first event is considered for analysis). If a mortality occurred, it would also be assigned to EOC 1.

Overlapping EOC – Example 2

Admission Date	Date of Surgery	OpType	Index?	Discharge date	Location	DB discharge date	Notes
1/1/2022	2/1/2022	CPB Cardiovascular	Yes	2/28/2022	Home	2/28/2022	EOC 1
3/1/2022	3/1/2022	Thoracic	No	3/12/2022	Home	3/12/2022	EOC 2

Overlapping EOC – Example 2

Admission Date	Date of Surgery	OpType	Index?	Discharge date	Location	DB discharge date	Notes
1/1/2022	2/1/2022	CPB Cardiovascular	Yes	2/28/2022	Home	2/28/2022	EOC 1
3/1/2022	3/1/2022	Thoracic	No	3/12/2022	Home	3/12/2022	EOC 2



While the admission dates are the same, the second admission does not contain an index operation within 30 days of the first; therefore, this **DOES NOT** qualify for the **Overlapping EOC rule**. The second event is not considered for analysis because it is not a cardiac optype. If a mortality occurred, it would be assigned to EOC 2.

Overlapping EOC – Example 3

Admission Date	Date of Surgery	OpType	Index?	Discharge date	Location	DB discharge date	Notes
1/1/2022	2/1/2022	CPB Cardiovascular	Yes	2/28/2022	Other acute care center	3/30/2022	EOC 1
3/1/2022	3/1/2022	Thoracic	No	3/12/2022	Other acute care center	3/30/2022	EOC 1
3/13/2022	3/13/2022	No CPB Cardiovascular	No	3/30/2022	Home	3/30/2022	EOC 1

Overlapping EOC – Example 3

Admission Date	Date of Surgery	OpType	Index?	Discharge date	Location	DB discharge date	Notes
1/1/2022	2/1/2022	CPB Cardiovascular	Yes	2/28/2022	Other acute care center	3/30/2022	EOC 1
3/1/2022	3/1/2022	Thoracic	No	3/12/2022	Other acute care center	3/30/2022	EOC 1
3/13/2022	3/13/2022	No CPB Cardiovascular	No	3/30/2022	Home	3/30/2022	EOC 1

Even though there are multiple *hospital admissions and multiple cardiac operations*, these events are all linked by having a common Database Discharge Date. Therefore, these are all **one** episode of care. The first cardiac operation of the EOC is the index and will be the event to which analysis (including if there had been a mortality) is assigned.

Changes to Tables 1 & 7

Background

Questions - patient population inclusion/exclusion Tables 1 and 7

- *What patients are included in each table row?*
- *When are the analysis exclusions applied?*
- *What patients were excluded from analysis?*
- *What about a patient who remains in the hospital at harvest?*

Background Continued

Row Names Confusing:

- Operations in Analysis – *defined as Op Types 1 and 2*
 - Included non-index cardiac operations (explorations)
 - Included other analysis exclusions

Included non-analyzed operations

	Calculation
Number of Operations /Patients	Operations Submitted
	Operations in Analysis
	Patients in Analysis

Background Continued

Row Names Confusing:

- Patients in Analysis – *defined as index operations*
 - A patient could be included more than once
 - Included other analysis exclusions

Included non-analyzed operations

	Calculation
Number of Operations /Patients	Operations Submitted
	Operations in Analysis
	Patients in Analysis

New Row Label Names

Line by line

Former Row Name	Updated Row Name & Inclusion Criteria
Operations Submitted	Operations Submitted All cases submitted in harvest, no exclusions applied

Line by line

Former Row Name	Updated Row Name & Inclusion Criteria
Operations Submitted	Operations Submitted All cases submitted in harvest, no exclusions applied
Operations in Analysis	CPB Cardiovascular + No CPB Cardiovascular Operations Submitted Cases submitted with OpType CPB Cardiovascular and No-CPB Cardiovascular OpType clean up occurs at this step Does not include any other analysis exclusions

Operation Type Cleanup Process

Beginning with the STS CHSD Fall 2016 harvest, the Data Warehouse implemented an Op Type Cleanup process. This process is designed to ensure that the analyses in the Feedback Report following each biannual Database harvest are based entirely on congenital and pediatric Cardiovascular Surgical Operations.

Most STS CHSD analyses are based on Index Operations. An Index Operation is the first Cardiovascular Surgical Operation of a given admission.

For Database versions 3.0, version 3.22, a Cardiovascular Surgical Operation is defined as an operation of Op Types "CPB" or "No CPB Cardiovascular."

For Database version 3.3 (and forward), a Cardiovascular Surgical Operation is defined as an operation of Op Types "CPB Cardiovascular" or "No CPB Cardiovascular."

Line by line

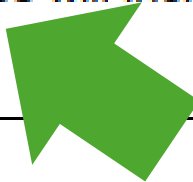
Former Row Name	Updated Row Name & Inclusion Criteria
Operations Submitted	Operations Submitted All cases submitted in harvest, no exclusions applied
Operations in Analysis	CPB Cardiovascular + No CPB Cardiovascular Operations Submitted Cases submitted with OpType CPB Cardiovascular and No-CPB Cardiovascular OpType clean up occurs at this step Does not include any other analysis exclusions
Patients in Analysis	Index Operations Submitted Identified index operation for analysis Excludes patients still in-house at time of harvest (EOC has not ended)

Line by line

Former Row Name	Updated Row Name & Inclusion Criteria
New	<p>Operations with a STAT Mortality Score Eligible for Analysis</p> <p>Analysis exclusions applied (no associated STAT score, missing data, neonatal pacemaker/AICD procedures, PDA ligations with wt. ≤ 2.5kg, overlapping EOC)</p> <p><i>Of Note:</i> Table 1 and Table 7 Mortality Analyses will include patients with procedures that do not have an associated STAT mortality score</p>

Line by line

Former Row Name	Updated Row Name & Inclusion Criteria
New	<p>Operations with a STAT Mortality Score Eligible for Analysis</p> <p>Analysis exclusions applied (no associated STAT score, missing data, neonatal pacemaker/AICD procedures, PDA ligations with wt. ≤ 2.5kg, overlapping EOC)</p> <p><i>Of Note:</i> Table 1 and Table 7 Mortality Analyses will include patients with procedures that do not have an associated STAT mortality score</p>



Number Submitted And In Analysis, Operative Mortality, and Complexity Information, Last 4 Years (Table 1)

- Overall mortality calculation in the table includes primary procedures without an associated STAT score.

Operative Mortality	Number of Mortalities
	Number Eligible
	Mortality Percent
	Mortality 95% CI

Line by line

Former Row Name	Updated Row Name & Inclusion Criteria
New	Operations with a STAT Mortality Score Eligible for Analysis Analysis exclusions applied (no associated STAT score, missing data, neonatal pacemaker/AICD procedures, PDA ligations with wt. ≤ 2.5 kg, overlapping EOC) <i>Of Note:</i> Table 1 and Table 7 Mortality Analyses will include patients with procedures that do not have an associated STAT mortality score
New	Current Analysis Exclusions Number of total index operations excluded from analysis (except for those still in-house at time of harvest)

Line by line

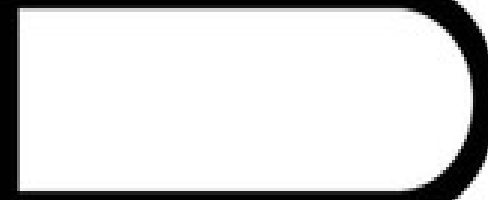
New	<p>Current Analysis Exclusions</p> <p>Number of total index operations excluded from analysis (except for those still in-house at time of harvest)</p>
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Patient ID	Operation ID	Surgery Date	Category	Participant Primary	STS Primary	Calculation	STAT Mortality Category	Report Name
			Number of Operations/Patients	1310-Coronary art...	1310-Coronar...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	460-Valvuloplasty, ...	460-Valvulopla...	Current Analysis Ex...	STAT Mortality Category 1	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	680-Valve replace...	680-Valve repl...	Current Analysis Ex...	STAT Mortality Category 1	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1450-Pacemaker i...	1450-Pacema...	Current Analysis Ex...	STAT Mortality Category 1	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1450-Pacemaker i...	1450-Pacema...	Current Analysis Ex...	STAT Mortality Category 1	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1450-Pacemaker i...	1450-Pacema...	Current Analysis Ex...	STAT Mortality Category 1	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1450-Pacemaker i...	1450-Pacema...	Current Analysis Ex...	STAT Mortality Category 1	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	3200-PA band adj...	3200-PA band ...	Current Analysis Ex...	STAT Mortality Category 2	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	5007-PAPVC repa...	5007-PAPVC r...	Current Analysis Ex...	STAT Mortality Category 2	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	3410-DORV repair...	3410-DORV re...	Current Analysis Ex...	STAT Mortality Category 3	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	2160-Hybrid stage...	2160-Hybrid st...	Current Analysis Ex...	STAT Mortality Category 5	Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1960-Delayed ster...	1960-Delayed ...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1960-Delayed ster...	1960-Delayed ...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1970-Mediastinal ...	1970-Mediasti...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1970-Mediastinal ...	1970-Mediasti...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1970-Mediastinal ...	1970-Mediasti...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1970-Mediastinal ...	1970-Mediasti...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	1970-Mediastinal ...	1970-Mediasti...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...
			Number of Operations/Patients	2010-Cardiac proc...	2010-Cardiac ...	Current Analysis Ex...		Number Submitted And In Analysis, Operative Mortality, and Complex...

Line by line

Former Row Name	Updated Row Name & Inclusion Criteria
New	Operations with a STAT Mortality Score Eligible for Analysis Analysis exclusions applied (no associated STAT score, missing data, neonatal pacemaker/AICD procedures, PDA ligations with wt. ≤ 2.5 kg, overlapping EOC) <i>Of Note:</i> Table 1 and Table 7 Mortality Analyses will include patients with procedures that do not have an associated STAT mortality score
New	Current Analysis Exclusions Number of total index operations excluded from analysis (except for those still in-house at time of harvest)

COMING SOON....



Note on Table 16

Table 16

Model 1 - Participant Operative Mortality and Adjusted Operative Mortality, Last 4 Years (Table 16)

**Data in this table are for the four year analytic window of 01/01/2022 to 12/31/2025, inclusive.
Calculations in Table 16 exclude patients without an age-for-weight Z-score between -7.0 and 5.0.**

Inclusion Update

Table 17

Table 17

Failure to select a child field for an applicable PostOp Event will result in event **INCLUSION**

Component Morbidity	3.41 Field/Harvest Code (Complications)	6.23.2 Field / Harvest Code (PostOpEventsMulti)
Renal failure requiring dialysis	230 / Renal failure requiring dialysis at discharge	POEAcrRenFailDial=1 / Requiring dialysis at the time of hospital discharge
	223 / Renal failure requiring temporary dialysis	POEAcrRenFailDial=2 / Temporary dialysis with no dialysis required at discharge
	224 / renal failure requiring temporary hemofiltration	POEAcrRenFailDial=3 / Temporary hemofiltration with no dialysis

Harvest Codes:

Code: Value:

- 1 Requiring dialysis at the time of ~~hospital~~ discharge from the episode of care
- 2 Temporary dialysis with no dialysis required at the time of discharge from the episode of care
- 3 Temporary hemofiltration with no dialysis at the time of discharge from the episode of care
- 4 No hemofiltration or dialysis required during the episode of care

Table 17

Failure to select a child field for an applicable PostOp Event will result in event **INCLUSION**

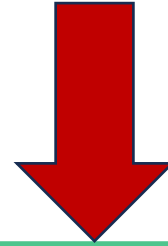
Unplanned cardiac reoperation	22 / Unplanned cardiac reoperation	POEReopRsn=1 / Residual or recurrent lesion
	240 / Bleeding requiring reoperation	POEReopRsn=2 / Reoperation for bleeding or suspected bleeding

Harvest Codes:

Code: Value:

- 1 Residual or recurrent lesion
- 2 Reoperation for bleeding or suspected bleeding
- 3 Mediastinal reexploration for reasons other than recurrent bleeding or suspected bleeding, residual or recurrent lesion (includes washouts)

Contact Information



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Thank you!