

Determination of Primary Diagnosis and Primary Procedure:

For every operation, a complete record must specify both a Primary Diagnosis and a Primary Procedure.

Determination of the Primary Diagnosis

The primary diagnosis for an operation is the diagnosis designated as primary by the Participant (Version 3.0 SeqNo 870 PrimDiag) (Version 3.22 and 3.3 SeqNo 900 PrimDiag). If no primary diagnosis is indicated by the Participant, then primary diagnosis is missing.

When one codes the Primary Diagnosis, one should select the diagnosis that is the principal diagnostic reason for performing the operation. The Primary Diagnosis can be:

1. the anatomic diagnosis for which a palliative or reparative surgery is indicated and planned (for example: "Tetralogy of Fallot", or "Truncus Arteriosus with Interrupted Aortic Arch"), OR
2. the physiologic derangement or hemodynamic abnormality to be addressed by the planned operation (for example: "Mitral regurgitation" after repair of "AVC (AVSD), Complete (CAVSD)" or "Ventricular Septal Defect" following repair of tetralogy of Fallot), OR
3. "Postoperative bleeding," after any surgical procedure.

While the various "Status post...." diagnoses should be listed as secondary diagnoses whenever applicable, a "Status post...." diagnosis should not be entered as a Primary Diagnosis.

Determination of the Primary Procedure of an Operation and Classification of Multiple-Procedure Operations

Beginning with the Fall 2014 STS Congenital Heart Surgery Database Feedback Report, a new methodology was implemented to determine the Primary Procedure for a given operation. This methodology was updated for the Spring 2015 STS Congenital Heart Surgery Database Feedback Report and additional updates were implemented at the time of the Fall 2016 STS Congenital Heart Surgery Database Feedback Report. The updated methodology is described below:

The guiding principle is that the Primary Procedure for a given operation is determined by selecting the procedure with the highest STAT Score.

Multiple procedures will be mapped to available combination procedure codes, just as before. Individual procedures that make up the combination procedures will not be removed but will remain as Secondary Procedures. These individual procedures that make up the combination procedures will not be considered for primary procedure determination.

If there is a tie for highest STAT Score:

- a. The procedure indicated as the primary by the participant will become the primary procedure.
- b. If no procedure was selected as primary by the participant; the first one appearing in the procedures dataset will be selected as the primary procedure (this may, or may not, be the first procedure entered by the participant).

EXCEPTIONS TO THE ABOVE-STATED RULE:

1. **New as of Spring 2015 Feedback Report (and Updated again as of Fall 2016 Feedback Report) – If a multiple procedure operation includes as a component procedure any one of the following procedures** (which are the procedures listed on the Data Collection Form in the section titled "PROCEDURE SPECIFIC FACTORS", exclusive of the three VSD repair procedures), then that procedure will be designated as the Primary Procedure for the operation. In the event that two such procedures are included as component procedures of a multiple procedure operation, then the eligible procedure with the highest STAT Score will be designated as the Primary Procedure for that operation:

- TOF - AVC (AVSD) repair
- TOF repair, No ventriculotomy
- TOF repair, Ventriculotomy, Nontransanular patch
- TOF repair, Ventriculotomy, Transanular patch
- TOF repair, RV-PA conduit
- TOF - Absent pulmonary valve repair
- Pulmonary atresia - VSD - MAPCA repair, Complete single stage repair (1-stage that includes bilateral pulmonary unifocalization +VSD closure + RV to PA connection [with or without conduit])
- Pulmonary atresia - VSD - MAPCA repair, Status post prior complete unifocalization (includes VSD closure + RV to PA connection [with or without conduit])
- Pulmonary atresia - VSD - MAPCA repair, Status post prior incomplete unifocalization (includes completion of pulmonary unifocalization + VSD closure + RV to PA connection [with or without conduit])
- Pulmonary atresia - VSD (including TOF, PA) repair
- AVC (AVSD) repair, Complete (CAVSD)
- Bidirectional cavopulmonary anastomosis (BDCPA) (bidirectional Glenn)
- Glenn (unidirectional cavopulmonary anastomosis) (unidirectional Glenn)
- Bilateral bidirectional cavopulmonary anastomosis (BBDCPA) (bilateral bidirectional Glenn)
- HemiFontan
- Superior Cavopulmonary anastomosis(es) (Glenn or HemiFontan) + Atrioventricular valvuloplasty
- Superior Cavopulmonary anastomosis(es) + PA reconstruction
- Fontan, Atrio-pulmonary connection
- Fontan, Atrio-ventricular connection
- Fontan, TCPC, Lateral tunnel, Fenestrated
- Fontan, TCPC, Lateral tunnel, Nonfenestrated
- Fontan, TCPC, External conduit, Fenestrated
- Fontan, TCPC, External conduit, Nonfenestrated
- Fontan, TCPC, Intra/extracardiac conduit, Fenestrated
- Fontan, TCPC, Intra/extracardiac conduit, Nonfenestrated
- *Fontan, TCPC, External conduit, hepatic veins to pulmonary artery, Fenestrated

- *Fontan, TCPC, External conduit, hepatic veins to pulmonary artery, Nonfenestrated
- Fontan, Other
- Fontan + Atrioventricular valvuloplasty
- Fontan revision or conversion (Re-do Fontan)
- Arterial switch operation (ASO)
- Arterial switch procedure + Aortic arch repair
- Arterial switch operation (ASO) and VSD repair
- Arterial switch procedure and VSD repair + Aortic arch repair
- Truncus arteriosus repair
- Truncus + Interrupted aortic arch repair (IAA) repair
- Norwood procedure
- *Ebstein's Repair

The above list was updated at the time of the Fall 2016 Feedback Report by adding the following three procedures denoted with an *:

- *Fontan, TCPC, External conduit, hepatic veins to pulmonary artery, Fenestrated
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- *Fontan, TCPC, External conduit, hepatic veins to pulmonary artery, Nonfenestrated
- *Ebstein's Repair

New as of Fall 2016 Feedback Report - This rule exception addresses concerns expressed by data managers and STS CHSD surgeon participants with respect to their perception of increased risk associated with either DKS or arch repair in association with a "Glenn Procedure."

1. If any multiple component operation that includes one of the below named "Glenn or HemiFontan Procedures" also includes either "1660 = DKS" or "1280 = Aortic Arch Repair", then, the Primary Procedure will be determined to be the pertinent one of the latter two procedures.
2. If any multiple component operation that includes one of the below named "Glenn or HemiFontan Procedures" also includes both "1660 = DKS" and "1280 = Aortic Arch Repair," then the Primary Procedure will be determined to be "1660 = DKS" as this is the component with the highest STAT Mortality Score of the three components under consideration.
3. Other component procedures (apart from those listed on the Data Collection Form in this section titled "PROCEDURE SPECIFIC FACTORS" exclusive of the three VSD repair procedures) will not alter the determination of Primary Procedure of a multiple component operation that includes one of the below named "Glenn or HemiFontan Procedures" as specified by these rules (regardless of the STAT Mortality Score[s] of the additional component procedures).

Glenn and HemiFontan Procedure List:

1. Bidirectional cavopulmonary anastomosis (BDCPA) (bidirectional Glenn)
2. Glenn (unidirectional cavopulmonary anastomosis) (unidirectional Glenn)

3. Bilateral bidirectional cavopulmonary anastomosis (BBDCPA) (bilateral bidirectional Glenn)
 4. HemiFontan
 5. Superior Cavopulmonary anastomosis(es) (Glenn or HemiFontan) + Atrioventricular valvuloplasty
 6. Superior Cavopulmonary anastomosis(es) + PA reconstruction
2. **In the event of a primary diagnosis “ASD, Sinus venosus” with procedures “PAPVC repair” and “ASD repair, Patch”, the primary procedure becomes a combined procedure: “ASD Repair, Patch + PAPCV Repair” (Data version 3.0 procedure number 2110).**
3. **Updated as of Fall 2016 Feedback Report - In the event of a simultaneous “Tricuspid Valvuloplasty” with a “VSD repair”, then “Valvuloplasty, Tricuspid” will NOT be considered the primary procedure:**
 In the event of the following simultaneous procedures:
 - “Valvuloplasty, Tricuspid”,
 combined with any of the following four procedures:
 - “VSD repair, Device”,
 - “VSD repair, Patch”
 - “VSD repair, Primary closure”,
 - “VSD, Multiple, Repair”,
 then, the primary procedure comes from the following list unless the operation includes an additional simultaneous procedure with a higher STAT Score or a procedure from the list above under Exception 1:
 - “VSD repair, Device”,
 - “VSD repair, Patch”
 - “VSD repair, Primary closure”,
 - “VSD, Multiple, Repair”.
 In the latter instance, the component procedure with the highest STAT Mortality Score or the procedure from the list above under Exception 1 is the Primary Procedure.
4. **If an operation contains any of the following component procedures:**
 - 890 = Transplant, Heart
 - 900 = Transplant, Heart and lung
 - 1410 = Transplant, Lung(s)
 then, the Primary Procedure will be taken from the above list.
5. **New as of Fall 2014 report – PDA Closure:** If “PDA closure, Surgical” is done concomitantly with any other procedure(s) which have an assigned STAT Score, then “PDA closure, Surgical” will not be designated as Primary Procedure. Of the remaining procedures which are included as components of the multiple procedure operation, the component procedure that has the highest STAT Score will be designated as Primary Procedure
6. **New as of Fall 2014 report – Shunt, Ligation and takedown:** If “Shunt, Ligation and takedown” is done concomitantly with any other procedure(s), which have an assigned

STAT Score then Shunt, Ligation and takedown” will not be designated as Primary Procedure. Of the remaining procedures which are included as components of the multiple procedure operation, the component procedure that has the highest STAT Score will be designated as Primary Procedure

7. **New as of Fall 2014 report – PA debanding:** If “PA debanding” is done concomitantly with any other procedure(s), which have an assigned STAT Score then " PA debanding" will not be designated as Primary Procedure. Of the remaining procedures which are included as components of the multiple procedure operation, the component procedure that has the highest STAT Score will be designated as Primary Procedure
8. **New as of Spring 2015 report – ASD Partial Closure:** If ASD partial closure is done concomitantly with any other procedure(s), which have an assigned STAT Score then "ASD partial closure" will not be designated as Primary Procedure. Of the remaining procedures which are included as components of the multiple procedure operation, the component procedure that has the highest STAT Score will be designated as Primary Procedure
9. **New as of Spring 2015 report – ASD Creation Enlargement:** If ASD creation/enlargement is done concomitantly with any other procedure(s), which have an assigned STAT Score then "ASD creation/enlargement" will not be designated as Primary Procedure. Of the remaining procedures which are included as components of the multiple procedure operation, the component procedure that has the highest STAT Score will be designated as Primary Procedure
10. **New as of Spring 2015 report – Atrial Septal Fenestration:** If Atrial septal fenestration is done concomitantly with any other procedure(s), which have an assigned STAT Score then "Atrial septal fenestration" will not be designated as Primary Procedure. Of the remaining procedures which are included as components of the multiple procedure operation, the component procedure that has the highest STAT Score will be designated as Primary Procedure
11. **New as of Spring 2015 report – If any of the above three procedures** "ASD partial closure", "ASD creation/enlargement", or "Atrial septal fenestration" is done concomitantly with "PDA closure, Surgical" as the only additional component procedure, then one of the above three procedures would supersede "PDA closure, Surgical" as the Primary Procedure.
12. **New as of Spring 2015 report – Other than the exception noted in “# 11” above,** if two or more of the six exception procedures (PDA closure, Surgical; Shunt, Ligation and takedown; PA Debanding; ASD partial closure; ASD creation/enlargement; and Atrial septal fenestration) are listed, and there are no additional component procedures that do have a STAT Score, then the exception procedure with the highest STAT score gets the designation of Primary Procedure.
13. **Reminder: For patients undergoing a “double switch” type of procedure (Senning or Mustard plus arterial switch or Senning/Mustard plus Rastelli procedure for the diagnosis of congenitally corrected transposition of the great arteries, aka L-TGA,**

aka atrioventricular discordance and ventriculo-arterial discordance) which also includes creation of a bidirectional cavopulmonary anastomosis (Bidirectional Glenn), the double switch should be designated as the primary procedure and the bidirectional cavopulmonary shunt should be coded as a 1.5 ventricle repair (STS procedure code 520) to prevent the bidirectional cavopulmonary shunt from being selected as the primary procedure because of its status as a benchmark operation.

If an operation does not have any procedures with a STAT Mortality Score (Appendix C), then:

1. The Primary Procedure designated by the Participant is used.
2. If no procedure was selected as Primary Procedure by the Participant; then the first procedure entered into the STS software becomes the Primary Procedure.