STS Adult Cardiac Surgery Database V2.9 Current as of: 6/20/2019
Procedure Identification Table

Note, fields in green are new in v2.9x, fields in yellow are added or changed from the v2.81 definition

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/2125	<Not used in this calculation>	• Yes	• Yes	• Yes
OpValve		Opvalve eq 1	Opvalve eq 1	Opvalve eq 1
VSAV/3390	• 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/3495	• 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)
OCarCongProc2/ 6520	• 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	• Missing • No other congenital procedures • PFO, Primary closure	• 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
OCarCongProc2	Ocarcongproc2 in (NULL,1,10,1291,1305)	Ocarcongproc2 in (NULL,1.10)	Ocarcongproc2 in (NULL,1,10,20,30)	Ocarcongproc2 in (NULL,1,10,1291,1305)
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	• Missing • No other congenital procedures • PFO, Primary closure	• 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
OCarCongProc3	Ocarcongproc3 in (NULL,1,10,1291,1305)	Ocarcongproc3 in (NULL,1,10)	Ocarcongproc3 in (NULL,1,10,20,30)	Ocarcongproc3 in (NULL,1,10,1291,1305)
Tricuspid Procedures: VSTV VSTrReplace VSTrValvec 3640, 3650, 3653	Unplanned Surgical Complications ONLY VSTV is one of : • No • Yes, unplanned due to surgical complication • Missing	Unplanned Surgical Complications ONLY VSTV is one of : • No • Yes, unplanned due to surgical complication • Missing	All tricuspid repairs are allowed. Tricuspid replacements and valvecotomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrReplace: • No • Missing AND VSTrValvec: • No • Missing 2. VSTV	Unplanned Surgical Complications ONLY VSTV is one of : • No • Yes, unplanned due to surgical complication • Missing

			• Yes, unplanned due to surgical complication”]	
Tricuspid Procedures: VSTV VSTrReplace VSTrValvec	VSTV in (NULL, 2,4)	VSTV in (NULL, 2,4)	[VSTrReplace in (NULL, 2) and VSTrValvec in (NULL,2)] OR VSTV eq 4	VSTV in (NULL, 2,4)
VSPV/3685	• No • Yes, unplanned due to surgical complication • Missing			
VSPV	VSPV in (NULL, 2,4)			
PrevVADExp/ 3825	• Yes, not during this procedure • No • Missing			
PrevVADExp	PrevVADExp in (NULL, 1,3)			
VADImpTmg/ 3845	• Pre-Operative (during same hospitalization but not same OR trip as 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 but not same OR trip as 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 but not same OR trip as 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			
VExp	VExp in (NULL, 3, 2)			
VExp2/3930	• Yes, not during this procedure • No • Missing			
VExp2	VExp2 in (NULL, 3, 2)			

VExp3/3985	• Yes, not during this procedure • No • Missing			
VExp3	VExp3 in (NULL, 3, 2)			
OCarLVA/4075	• No • Missing			
OCarLVA	OCarLVA in (NULL, 2)			
OCarVSD/4130	• No • Missing			
OCarVSD	OCarVSD in (NULL, 2)			
AortProc/2125	• No • Yes, unplanned due to surgical complication • Missing			
AortProc	Aortproc in (NULL, 2,4)			
EndovasProc/5066	• No • Missing			
EndovasProc	EndovasProc in (NULL, 2)			
OCarAFibIntraLes/4040	• No • Missing	• No • Missing	<Not used in this calculation>	• No • Missing
OCarAFibIntraLes	OcarAFibIntraLes in (NULL, 2)	OcarAFibIntraLes in (NULL, 2)		OcarAFibIntraLes in (NULL, 2)
OCarAFibLesLoc/4191	• Primarily epicardial • Missing	• Primarily epicardial • Missing	<Not used in this calculation>	• Primarily epicardial • Missing
OCarAFibLesLoc	OCarAFibLesLoc ne 2	OCarAFibLesLoc ne 2		OCarAFibLesLoc ne 2
OCarASDSec/4035	• No • Missing	• No • Missing	<Not used in this calculation>	• No Missing
OCarASDSec	OCarASDSec in (NULL, 2)	OCarASDSec in (NULL, 2)		OCarASDSec in (NULL, 2)
OCarACD 4055	<Not used in this calculation>	<Not used in this calculation>	• No • Missing • Permanent Pacemaker	<Not used in this calculation>
OCarACD			OCarACD in (NULL, 1, 2)	
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/ 4085	• No • Missing			
OCPulThromDis	OCPulThromDis in (NULL, 1)			
OCarSubaStenRes/ 4090	• No • Missing			
OCarSubaStenRes	OCarSubaStenRes in (NULL, 2)			
OCarSVR/4105	• No • Missing			
OCarSVR	OCarSVR in (NULL, 2)			
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			
VSTCVTri	VSTCVTri in (NULL, 2)			
VSTCVPu/3695	• No • Missing			
VSTCVPu	VSTCVPu in (NULL, 2)			

CCancCase/2050	• No • Missing
CCancCase	CCancCase in (NULL, 2)
ONCCarEn/6530	• No • Yes, unplanned due to surgical complication • Missing
ONCCarEn	ONCCarEn in (NULL, 2, 4)
ONCOVasc/6535	• No • Yes, unplanned due to surgical complication • Missing
ONCOVasc	ONCOVasc in (NULL, 2, 4)
ONCOThor/6540	• No • Yes, unplanned due to surgical complication • Missing
ONCOThor	ONCOThor in (NULL, 2, 4)
ONCOther/6545	• No • Yes, unplanned due to surgical complication • Missing
ONCOther	ONCOther in (NULL, 2, 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)**
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/2125	• Yes	• Yes	• Yes	• Yes
OpValve	Opvalve eq 1	Opvalve eq 1	Opvalve eq 1	Opvalve eq 1
VSAV/3390	• 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	• No • Yes, unplanned due to surgical complication • Missing
VSAV	VSAV in (NULL, 2,4)	VSAV in (3,5)	VSAV in (NULL, 2,4)	VSAV in (NULL, 2,4)
VSAVPr/3395	<Not used in this calculation>	• Replacement	<Not used in this calculation>	<Not used in this calculation>
VSAVPr		VSAVPr eq 1		
VSMV/3495	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy	• Yes, planned • Yes, unplanned due to unsuspected disease or anatomy
VSMV	VSMV in (3,5)	VSMV in (3,5)	VSMV in (3,5)	VSMV in (3,5)
VSMVPr/3500	• Replacement	• Replacement	• Repair	• Repair
VSMVPr	VSMVPr eq 2	VSMVPr eq 2	VSMVPr eq 1	VSMVPr eq 1
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 • ASD repair, Primary closure • ASD repair, Patch	• Missing • PFO, Primary closure • ASD repair, Primary closure • ASD repair, Patch	• 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 • ASD repair, Primary closure • ASD repair, Patch
OCarCongProc1	Ocarcongproc1 in (NULL,10,20, 30,1291,1305)	Ocarcongproc1 in (NULL,10,20,30)	Ocarcongproc1 in (NULL,10,20,30)	Ocarcongproc1 in (NULL,10,20,30,1291,1305)
OCarCongProc2/ 6520	• Missing • No other congenital procedures • PFO, Primary closure • Anomalous origin of coronary artery	• Missing • No other congenital procedures • PFO, Primary closure • ASD repair, Primary closure	• Missing • No other congenital procedures • PFO, Primary closure • ASD repair, Primary closure	• Missing • No other congenital procedures • PFO, Primary closure • Anomalous origin of coronary

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 aortic origin of coronary artery from aorta (AAOCA) repair • ASD repair, Primary closure • ASD repair, Patch			• 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
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 VSTrReplace VSTrValvec/ 3640, 3650, 3653	All tricuspid repairs are allowed. Tricuspid replacements and valvecotomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrReplace: • No • Missing AND VSTrValvec: • No • Missing 2. VSTV	All tricuspid repairs are allowed. Tricuspid replacements and valvecotomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrReplace: • No • Missing AND VSTrValvec: • No • Missing 2. VSTV	All tricuspid repairs are allowed. Tricuspid replacements and valvecotomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrReplace: • No • Missing AND VSTrValvec: • No • Missing 2. VSTV	All tricuspid repairs are allowed. Tricuspid replacements and valvecotomies are only allowed if the tricuspid procedure was unplanned due to surgical complications. Must satisfy at least one of (1) or (2): 1. VSTrReplace: • No • Missing AND VSTrValvec: • No • Missing 2. VSTV

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)**
	• Yes, unplanned due to surgical complication"]	• Yes, unplanned due to surgical complication"]	• Yes, unplanned due to surgical complication"]	• Yes, unplanned due to surgical complication"]
Tricuspid Procedures VSTV VSTrReplace VSTrValvec	[VSTrReplace in (NULL, 2) and VSTrValvec in (NULL,2)] OR VSTV eq 4	[VSTrReplace in (NULL, 2) and VSTrValvec in (NULL,2)] OR VSTV eq 4	[VSTrReplace in (NULL, 2) and VSTrValvec in (NULL,2)] OR VSTV eq 4	[VSTrReplace in (NULL, 2) and VSTrValvec in (NULL,2)] OR VSTV eq 4
VSPV/3685	• No • Yes, unplanned due to surgical complication • Missing			
VSPV	VSPV in (NULL, 2,4)			
PrevVADExp/ 3825	• Yes, not during this procedure • No • Missing			
PrevVADExp	PrevVADExp in (NULL, 1,3			
VADImpTmg/ 3845	• Pre-Operative (during same hospitalization but not same OR trip as 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 but not same OR trip as 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 but not same OR trip as 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			
VExp	VExp in (NULL, 3, 2)			
VExp2/3930	• Yes, not during this procedure			

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)**
	• No • Missing			
VExp2	VExp2 in (NULL, 3, 2)			
VExp3/3985	• Yes, not during this procedure • No • Missing			
VExp3	VExp3 in (NULL, 3, 2)			
OCarLVA/4075	• No • Missing			
OCarLVA	OCarLVA in (NULL, 2)			
OCarVSD/4130	• No • Missing			
OCarVSD	OCarVSD in (NULL, 2)			
AortProc/2128	• No • Yes, unplanned due to surgical complication • Missing			
AortProc	Aortproc in (NULL, 2,4)			
EndovasProc/5066	• No • Missing			
EndovasProc	EndovasProc in (NULL, 2)			
OCarAFibIntraLes 4040	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>
OCarAFibIntraLes				
OCarAFibLesLoc 4191	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>
OCarAFibLesLoc				
OCarASDSec 4035	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>	<Not used in this calculation>
OCarASDSec				
OCarACD 405	• No • Missing • Permanent Pacemaker	• No • Missing • Permanent Pacemaker	• No • Missing • Permanent Pacemaker	• No • Missing • Permanent Pacemaker
OCarACD	OCarACD in (NULL, 1, 2)	OCarACD in (NULL, 1, 2)	OCarACD in (NULL, 1, 2)	OCarACD in (NULL, 1, 2)
OCarACDLE/4065	• Yes, unplanned due to surgical complication • No			

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)**
	• Missing			
OCarACDLE	OCarACDLE in (NULL, 2,4)			
OCarLasr/4110	• No • Missing	• No • Missing	• No • Missing	• No • Missing
OCarLasr	OCarLasr in (NULL, 2)	OCarLasr in (NULL, 2)	OCarLasr in (NULL, 2)	OCarLasr in (NULL, 2)
OCPulThromDis/ 4085	• No • Missing			
OCPulThromDis	OCPulThromDis in (NULL, 1)			
OCarSubaStenRes/ 4090	• No • Missing			
OCarSubaStenRes	OCarSubaStenRes in (NULL, 2)			
OCarSVR/4105	• No • Missing			
OCarSVR	• OCarSVR in (NULL, 2)			
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			

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)**
VSTCVTri	• VSTCVTri in (NULL, 2)			
VSTCVPu/3695	• No • Missing			
VSTCVPu	• VSTCVPu in (NULL, 2)			
CCancCase/2050	• No • Missing			
CCancCase	• CCancCase in (NULL, 2)			
ONCCarEn/6530	• No • Yes, unplanned due to surgical complication • Missing			
ONCCarEn	• ONCCarEn in (NULL, 2, 4)			
ONCOVasc/6535	• No • Yes, unplanned due to surgical complication • Missing			
ONCOVasc	• ONCOVasc in (NULL, 2, 4)			
ONCOThor/6540	• No • Yes, unplanned due to surgical complication • Missing			
ONCOThor	• ONCOThor in (NULL, 2, 4)			
ONCOther/6545	• No • Yes, unplanned due to surgical complication • Missing			
ONCOther	• ONCOther in (NULL, 2, 4)			

**For Version 2.9 - Please note that the ProcID algorithms for all Mitral Valve Procedures now also include intracardiac lesions and tricuspid repairs. Since it is common practice to do a full Maze procedure and/or an occasional tricuspid repair STS Leadership wanted to keep these cases in the MV Risk Algorithms.

The following fields are no longer collected:

AortProcTEVAR – replaced by EndovascProc

OpTricus – replaced by VSTrRepair, VSTrReplace, and VSTrValvec