NCTSD - National Congenital Heart Surgery Database (NCHSD)
OPERATION

Instruction:	i) Where check boxes ☐ are provided, check ☑ one or more boxes. Where radio buttons ○ are provided, check ⊙ one box only.
	ii) Red asterisk (*) indicates the field is mandatory and must be filled.

PATIENT INFORMATION

For Office Use	PatientID:	NotifID:	Local RN No:
Patient Name			
Identification Card Number		**Age at admission** *(auto-calculated)*	*(years)*
Reporting Centre			

GENERAL INFORMATION

01. * **Date & Time of Operation** `IW`
- i. * Date In ☐☐ / ☐☐ / ☐☐☐☐ *(dd/mm/yyyy)* Time In ☐☐ : ☐☐ *(HH:mm)*
- ii. * Date Out ☐☐ / ☐☐ / ☐☐☐☐ *(dd/mm/yyyy)* Time Out ☐☐ : ☐☐ *(HH:mm)*
- iii. Duration *(auto-calculated)* _____ *(minutes)*

02. * **Operation Theatre** ○ 2B ○ 3B ○ 4B ○ 5B ○ ICU ○ A

03. **Number of previous heart operations**

04. **Cases in OT**

05. * **Surgical Team** `I`

i. * Consult Surgeon		v. Anaesthetist	
ii. * Surgeon		vi. Anaesthetist Assistant	
iii. Assist Surgeon 1		vii. Surgical Assistant	
iv. Perfusionist			

06. **Surgery Description**

07. **Operation details**

SECTION 4.1 : PROCEDURE CLASSIFIED

01. * **Change in Diagnosis** ○ No   ○ Yes, specify _____

if yes: Diagnosis Discrepancy ○ Minor (Not change the surgical plan)   ○ Major (Change the surgical plan or additional surgery)

02. *	Aortic Arch Coarctation? `W`	○ Yes	○ No	○ Unknown
03. *	Aortic Arch Hypoplasia? `W`	○ Yes	○ No	○ Unknown
04. *	Aortic Valve Atresia? `W`	○ Yes	○ No	○ Unknown
05. *	Aortic Valve Stenosis? `W`	○ Yes	○ No	○ Unknown
06. *	Aortic Valve Hypoplasia? `W`	○ Yes	○ No	○ Unknown
07. *	Mitral Valve Atresia? `W`	○ Yes	○ No	○ Unknown
08. *	Mitral Valve Stenosis? `W`	○ Yes	○ No	○ Unknown
09. *	Mitral Valve Hypoplasia? `W`	○ Yes	○ No	○ Unknown
10. *	Ventricular Septal Defect? `W`	○ Yes	○ No	○ Unknown
11. *	Left Ventricle Size? `W`	○ Normal	○ Small	○ Unknown

12. *	Operation Status `W`	○ Elective	○ Emergency	○ Urgent	○ Salvage

13. *	Operation Type	○ Open Heart	○ Close Heart	○ Miscellaneous

14. *	RACHS-1 Category `I`	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

15. * **Other pertinent medical information** `I`

16. * **Were there additional cardiac procedures done in the same OR visit** `W`   ○ Yes   ○ No   ○ Unknown

17. * **Surgical procedure** `W`   #1 _____ #2 _____ #3 _____ #4 _____ #5 _____

18. **Surgical approach**
- ☐ Primary median sternotomy   ☐ Mini sternotomy
- ☐ Standard thoracotomy   ☐ Mini thoracotomy
- ☐ Redo sternotomy   ☐ Unknown

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SECTION 4.1 : PROCEDURE CLASSIFIED

19.	**Other thoracic and vascular procedures**	☐ None ☐ Aorta or peripheral vascular	☐ Carotid endarterectomy ☐ Other thoracic
20. *	**Surgical specimens sent for exam**	○ Yes ○ No	○ Not Applicable
21. *	**IntraOp TEE** `W`	○ Yes ○ No	
22. *	**Surgical decision change a/m TEE**	○ Yes, specify _____	○ No
23. *	**Was an epicardial echo done in this operation?** `W`	○ Yes ○ No	○ Unknown
24. *	**Was sternum left open at the end of operation?** `W`	○ Yes ○ No	○ Unknown
25. *	**Were there any complications?** `W`	○ Yes ○ No	○ Unknown

26. *	**Intraoperative complications** `W`
	☐ None
	☐ Arrhythmia requiring drug therapy
	☐ Arrhythmia requiring electrical cardioversion or defibrillation
	☐ Arrhythmia requiring permanent pacemaker
	☐ Excessive bleeding
	☐ Cardiac dysfunction resulting in low cardiac output
	☐ Cardiac failure (severe cardiac dysfunction)
	☐ Difficulty on separation from CPB
	☐ Mechanical circulatory support (IABP, VAD,ECMO, or CPS)
	☐ Multi-System Organ Failure (MSOF) = Multi-Organ Dysfunction Syndrome (MODS)
	☐ Seizure
	☐ Unknown
	☐ Others, specify _____

27. *	**Intraoperative Mortality** `W`	○ Yes	○ No		
28. *	**Pericardial Space**	○ Free of adhesions		○ Not free of adhesions	
29. *	**Heart Size**	○ Normal	○ Mildly	○ Moderately	○ Severely
30. *	**Location & number of Pacing wire**	○ RA	○ RV	○ X 1	○ X 2
31.	**Chest Tube**	☐ Pericardial	☐ Mediastinal	☐ Right	☐ Left
32. *	**Location & Number of chest drain**	○ RA	○ RV	○ X 1	○ X 2
33. *	**Chest Closure**	○ Standard	○ Delay		

34. *	**Other cardiac procedure (*Other than isolated ASD, VSD, TOF)** `W`	**Operative Findings**	
		Operative procedures	

35. *	**Operative procedures Template**	○ ASD CLOSURE ○ VSD CLOSURE ○ TOF REPAIR ○ PDA LIGATION ○ BT SHUNT	○ PA BANDING ○ COA REPAIR ○ PPM ○ DIAPHRAGM PLICATION
36. *	**Open chest after surgery** `I`	○ Yes ○ No	
37. *	**Require additional surgery for bleeding** `I`	○ Yes, specify _____	○ No

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SECTION 4.3 : AORTIC PROCEDURE

		☐ Root	☐ Ascending	☐ Arch	☐ Descending	☐ Abdominal
01. *	**Aortic procedure**	○ Interposition tube graft ○ Tube graft + separate AVR ○ Root replacement with composite valve graft and coronary reimplantation ○ Root replacement with preservation of native valve and coronary reimplantation ○ Homograft root replacement ○ Autograft root replacement (Ross procedure) ○ Sinus of valsalva repair ○ Reduction aortoplasty ○ Aortic patch graft ○ Endovascular stenting ○ None	○ Interposition tube graft ○ Tube graft + separate AVR ○ Root replacement with composite valve graft and coronary reimplantation ○ Root replacement with preservation of native valve and coronary reimplantation ○ Homograft root replacement ○ Autograft root replacement (Ross procedure) ○ Sinus of valsalva repair ○ Reduction aortoplasty ○ Aortic patch graft ○ Endovascular stenting ○ None	○ Interposition tube graft ○ Interposition tube graft (arch vessels anastomosed as a cuff) ○ Interposition tube graft (arch vessels anastomosed individually) ○ Interposition tube graft (hemi-arch replacement) ○ Reduction aortoplasty ○ Endovascular stenting ○ None	○ Interposition tube graft ○ Interposition tube graft (elephant trunk) ○ Reduction aortoplasty ○ Endovascular stenting ○ Frozen Elephant Trunk (FET) ○ None	○ Interposition tube graft ○ Interposition tube graft (elephant trunk) ○ Reduction aortoplasty ○ Endovascular stenting ○ None
02. *	**Aortic pathology**	○ Aneurysm ○ Syphilis ○ Dissection ○ Transection ○ Coarctation ○ Atheromatous ○ Marfan ○ Mycotic ○ Unknown	○ Aneurysm ○ Syphilis ○ Dissection ○ Transection ○ Coarctation ○ Atheromatous ○ Marfan ○ Mycotic ○ Unknown	○ Aneurysm ○ Syphilis ○ Dissection ○ Transection ○ Coarctation ○ Atheromatous ○ Marfan ○ Mycotic ○ Unknown	○ Aneurysm ○ Syphilis ○ Dissection ○ Transection ○ Coarctation ○ Atheromatous ○ Marfan ○ Mycotic ○ Unknown	○ Aneurysm ○ Syphilis ○ Dissection ○ Transection ○ Coarctation ○ Atheromatous ○ Marfan ○ Mycotic ○ Unknown
03.	**Interposition tube graft (arch vessels anastomosed individually) Average Size**					
04.	**Number of Aortic Procedures**					

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SECTION 4.4 : VALVE PROCEDURE

Valve Procedure Data	Aortic valve	Mitral valve	Tricuspid valve	Pulmonary valve
01. * **Hemodynamic Pathology**	○ None ○ Regurgitation ○ Stenosis ○ Mixed ○ Unknown	○ None ○ Regurgitation ○ Stenosis ○ Mixed ○ Unknown	○ None ○ Regurgitation ○ Stenosis ○ Mixed ○ Unknown	○ None ○ Regurgitation ○ Stenosis ○ Mixed ○ Unknown
02. * **Explant type**	○ Native ○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ None ○ Unknown	○ Native ○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ None ○ Unknown	○ Native ○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ None ○ Unknown	○ Native ○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ None ○ Unknown
03. * **Native valve pathology**	☐ None ☐ Congenital ☐ Degenerative valve ☐ Active endocarditis ☐ Previous endocarditis ☐ Rheumatic ☐ Annuloaortic Estasia ☐ Calcific degeneration ☐ Ischemic ☐ Funtional ☐ Other native valve pathology ☐ Unknown	☐ None ☐ Congenital ☐ Degenerative valve ☐ Active endocarditis ☐ Previous endocarditis ☐ Rheumatic ☐ Annuloaortic Estasia ☐ Calcific degeneration ☐ Ischemic ☐ Funtional ☐ Other native valve pathology ☐ Unknown	☐ None ☐ Congenital ☐ Degenerative valve ☐ Active endocarditis ☐ Previous endocarditis ☐ Rheumatic ☐ Annuloaortic Estasia ☐ Calcific degeneration ☐ Ischemic ☐ Funtional ☐ Other native valve pathology ☐ Unknown	☐ None ☐ Congenital ☐ Degenerative valve ☐ Active endocarditis ☐ Previous endocarditis ☐ Rheumatic ☐ Annuloaortic Estasia ☐ Calcific degeneration ☐ Ischemic ☐ Funtional ☐ Other native valve pathology ☐ Unknown
04. **Other native valve pathology / findings**				
05. **Reason for repeat valve surgery**	○ None ○ Thrombosis in growth of tissue valve ○ Dehiscene ○ Embolism ○ Infection ○ Intrinsic valve failure ○ Haemolysis ○ Other ○ Unknown	○ None ○ Thrombosis in growth of tissue valve ○ Dehiscene ○ Embolism ○ Infection ○ Intrinsic valve failure ○ Haemolysis ○ Other ○ Unknown	○ None ○ Thrombosis in growth of tissue valve ○ Dehiscene ○ Embolism ○ Infection ○ Intrinsic valve failure ○ Haemolysis ○ Other ○ Unknown	○ None ○ Thrombosis in growth of tissue valve ○ Dehiscene ○ Embolism ○ Infection ○ Intrinsic valve failure ○ Haemolysis ○ Other ○ Unknown
06. **Other reason for repeat valve surgery**				
07. * **Valve procedure**	○ Replacement ○ Repair ○ None	○ Replacement ○ Repair ○ None	○ Replacement ○ Repair ○ None	○ Replacement ○ Repair ○ None
08. * **Implant type**	○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ Suture ○ None	○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ Suture ○ None	○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ Suture ○ None	○ Mechanical ○ Biological ○ Homograft ○ Autograft ○ Ring ○ Suture ○ None

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		Aortic valve	Mitral valve	Tricuspid valve	Pulmonary valve
09. *	**Implant prosthesis (heart valve registry code)**				
10.	**Valve or ring size/mm**				
11.	**Number of valve replaced / repaired**				
	Valve Morphology	**Aortic valve**	**Mitral valve**	**Tricuspid valve**	**Pulmonary valve**
12.	**Annular Dilatation**	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown
13.	**Annular Calcification**	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown
14.	**Commissural Fusion**	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown
15.	**Leaflet Perforation**	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
16.	**Leaflet Prolapse**	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
17.	**Leaflet Cleft**	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
18.	**Leaflet Thickening**	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
19.	**Leaflet Calcification**	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
20.	**Chordal side**		○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	

SECTION 4.4 : VALVE PROCEDURE

Valve Morphology	Aortic valve	Mitral valve	Tricuspid valve	Pulmonary valve
21. Chordal Details		☐ None ☐ Ruptured ☐ Shortened ☐ Elongation ☐ Thickened ☐ Fused ☐ Others ☐ Unknown	☐ None ☐ Ruptured ☐ Shortened ☐ Elongation ☐ Thickened ☐ Fused ☐ Others ☐ Unknown	
22. Papillary Muscle Site		○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	
23. Papillary Muscle		☐ None ☐ Ruptured ☐ Shortened ☐ Elongation ☐ Thickened ☐ Fused ☐ Others ☐ Unknown	☐ None ☐ Ruptured ☐ Shortened ☐ Elongation ☐ Thickened ☐ Fused ☐ Others ☐ Unknown	

Valve Procedure	Aortic valve	Mitral valve	Tricuspid valve	Pulmonary valve
24. Leaflet Resection	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
25. Leaflet Extension / Patch	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown
26. Leaflet Plication	○ None ○ LCC ○ RCC ○ NCC ○ LCC & RCC ○ RCC &NCC ○ LCC & NCC ○ ALL ○ Unknown	○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	○ None ○ AC ○ RC ○ LC ○ AC & RC ○ RC & LC ○ AC & LC ○ ALL ○ Unknown

	Valve Procedure	Aortic valve	Mitral valve	Tricuspid valve	Pulmonary valve
27.	**Chordae Procedure Side**		○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	
28.	**Chordae Procedure Details**		☐ None ☐ Replacement ☐ Shortened ☐ Transfer ☐ Resected ☐ Fenestrated ☐ Others ☐ Unknown	☐ None ☐ Replacement ☐ Shortened ☐ Transfer ☐ Resected ☐ Fenestrated ☐ Others ☐ Unknown	
29.	**Pericardial Patch / Extension**		○ None ○ Anterior ○ Posterior ○ Both ○ Unknown	○ None ○ Anterior ○ Posterior ○ Septal ○ Anterior & Posterior ○ Anterior & Septal ○ Posterior & Septal ○ All ○ Unknown	
30.	**Papillary Muscle splitting**		○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	
31.	**Commisurotomy**	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	
32.	**Commissuroplasty**	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	○ Yes ○ No ○ Unknown	

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SECTION 5 : CARDIOPULMONARY SUPPORT
SECTION 5.1 : PERFUSION

01. *	**CPB Blood Prime**	○ Yes	○ No	
		a. * CPB Time	*(minutes)*	**W**
		b. * Cross Clamp Time - CPB	*(minutes)*	**W**
		c. * Circulatory Arrest Time		**W**
02. *	**Patiet Temperature Monitoring Site**	**a. * Bladder**	○ Yes, Temperature: *(°C)* ○ No	
		b. * Esophageal	○ Yes, Temperature: *(°C)* ○ No	
		c. * Nasopharyngeal	○ Yes, Temperature: *(°C)* ○ No	
		d. * Rectal	○ Yes, Temperature: *(°C)* ○ No	
		e. * Tympanic	○ Yes, Temperature: *(°C)* ○ No	
		f. * Other	○ Yes, Temperature: *(°C)* ○ No	
03.	**Cooling Time**	*(minutes)*		
04.	**Rewarming Time**	*(minutes)*		
05. *	**Arterial Blood Gas Management During**	○ Alpha STAT　　○ pH STAT　　○ phSTAT cooling / Alpha STAT rewarming　　○ Other Combination		
06.	**Hematocrit prior to Circulatory Arrest or cerebral perfusion**			
07. *	**Cardioplegia Delivery** **W**	○ None　　○ Antegrade　　○ Retrograde　　○ Both		
		a. * Cardioplegia Type	○ Blood　　○ Crystalloid　　○ Both　　○ Other	
		b. * Cardioplegia Solution	○ del Nido　　○ Custodial / Bretschneider (HTK)　　○ Buckberg　　○ Plegisol / St. Thomas　　○ University of Wisconsin ○ Celsior　　○ Roe's solution　　○ Microplegia with Potassium　　○ Microplegia with Adenocaine　　○ Other	
		c. Cardioplegia number of dosage		
		d. Hematocrit - First after initiating CPB		
		e. Hematocrit - Last Measure during CPB		
		f. Hematocrit - Post CPB, Post Protamine		
		g. * Ultrafiltration perform after CPB	○ No ○ Yes, Modified Ultrafiltration (MUF) ○ Yes, Conventional Ultrafiltration (CUF) ○ Yes, MUF and CUF	

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SECTION 5 : CARDIOPULMONARY SUPPORT
SECTION 5.1 : PERFUSION

	○ Yes			○ No	
01. **Cerebral Perfusion Utilize**	**a. *** **Selective antegrade Cerebral Perfusion Time**		**W**		
	b. **Cerebral Perfusion Cannulation Site**	i. **Innominate Artery**	○ Yes	○ No	
		ii. **Right subclavian**	○ Yes	○ No	
		iii. **Right axilary Artery**	○ Yes	○ No	
		iv. **Right carotid Artery**	○ Yes	○ No	
		v. **Left carotid Artery**	○ Yes	○ No	
		vi. **Superior Vena Cava**	○ Yes	○ No	
02. **Cerebral Perfusion period**					
03. **Cerebral Perfusion Flow Rate**	*(mL/kg) per minute*				
04. **Cerebral Perfusion Temperature**	*(°C)*				