

Checklist in pediatric cardiac surgery in Brazil: an useful and necessary adaptation of the Quality Improvement Collaborative International Congenital Heart Surgery in Developing Countries

Checklist em Cirurgia Cardíaca Pediátrica no Brasil: uma adaptação útil e necessária do International Quality Improvement Collaborative for Congenital Heart Surgery in Developing Countries

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In May 2009, a partnership was signed between the Children's HeartLink Foundation and Pediatric Cardiovascular Surgery Department of São Jose do Rio Preto, in the Base Hospital of the Medical School of São José do Rio Preto (FAMERP). Since then, we have introduced changes in order to identify predictors of morbidity and mortality, establish appropriate routines and improve the quality of care for children with heart disease - congenital and acquired in childhood - in our environment [1].

One of the opportunities offered by the Children's HeartLink Foundation was participation in *International Quality Improvement Collaborative for Congenital Heart Surgery in Developing Countries*, program form the Boston Children's Hospital - Harvard Medical School - United States, coordinated by Dr. Kathy Jenkins [1].

With this program, we began to participate in a worldwide database, based on RACHS-1 [2]. All surgical patients receive a number to prevent identification and information

THE VIDEO PERTINENT TO THE TEXT IS PUBLISHED ON THE JOURNAL WEBSITE: http://www.rbccv.org.br/video/v26n4/

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of the first 30 days or until hospital discharge are sent via Internet to the group at the Boston Children's Hospital, which periodically informs us about our results so we can identify gaps and correct them.

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The same group also minister videoconferences each month (called webinars), previously scheduled and with defined themes, which allows distance learning and facilitate dialogue between our group in Brazil and the group in the United States of America.

The primary aim of these classes and the program is to reduce mortality in 30 days and, therefore, three major themes have been presented and discussed throughout the year: basic practices for staff, reduction of surgical site infection and bacterial sepsis and safe practices during the operation.

The checklist for pediatric cardiac surgery, adapted, which we present below is part of safe practices during operation. It should be used to improve patient care, improve communication and team work dynamics in the

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Checklist fo	r pediatric carc	liac surgery
Before Induction SIGN IN	Before skin incision ATTENTION ALL	After completion of the operation SIGN OUT
Anesthesiologist and circulator together confirm:	All team members introduced themselves by name and role in the surgery The surgeon confirms:	The surgeon, instrumentist and circulator together confirm: - The surgical procedure performed - Counting of gauze, needles and other materials
 Patient data Place of operation Procedure to be performed Allergy to drugs 	 Patient's name, site and type of operation Relevant imaging studies and previous discussions All necessary equipment is available (aspirator, saw and scalpel)? How long does the procedure take? Need for prostheses? 	HANDOVER TO ICU The surgeon explains:
- Plan for keeping the patient warm - Need for blood products: If yes, has the blood bank been	The perfusionist confirms: - Details on cannulation - Minimum CPB temperature - Cardioolegia	- The operation performed - Possible risks and complications
The anesthesiologist confirms:	 Need for selective cerebral perfusion and/or cerebral cooling with ice Need for circulatory arrest, shunt, collateral arteries, procedures to air removal The anesthesiologist confirms: 	The anesthesiologist explains: - Mechanical ventilation care - Hemodynamic stability and pressure support - Transesophageal echocardiographic findings - Availability of blood products
 Venous access is suitable for the operation? What will be needed? Possibility of difficulty intubation airway/aspiration? If ves. what's the annroach? 	 - Administration of antibiotics before incision - Plan for extra dose of antibiotics during surgery - Have the defibrillator paddles been plugged in? - Have the drug infusion pumps been checked? The circulator confirms: 	- Other surgery details Surgeon, anesthesiologists and intensivists discuss the need
	- Prostheses and other materials in the operating room ALL TEAMS SHOULD AUTHORIZE STARTING THE OPERATION	for testing and parameters to be controlled in the next 24 hours in ICU

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CHECKLIST - CARDIOPULMONARY BYPASS

Date: <u>25 / 07 / 11</u> Patient:	Maria Cecília Kora Olivaia
Perfusionist: Rafael S.Policarpo SBCEC nº 345	Renata G.Finoti SBCEC nº 143
PATIENT	CIRCUIT PREPARATION
 Diagnosis CIV Surgery to be performed culors ptoplastic Weight 760 kg Height 84 cm Picture information (heparin dose, BM, valve diameters and cannulas) Heart rate Blood group 94 	 Tubes connected safely No leaks in the connections Removal of air from the circuit Calibration of the arterial roller and aspir Replacement tweezers BLOOD PRODUCTS Data on the blood and plasma bag confered
Pre-CPB urine 50 ml	with the patient's data
EQUIPMENT	PERFUSATE COMPOSITION
 Air and O2 Pressure Reducers 220V outlets Heart Lung Machine battery CPB Pressure Monitor Patient Pressure Monitor 	Crystalloid 400ml Blood Products 100ml parque Heparin 0, 6ml Bicarbonate 15ml Mannitol 40ml
CPB and Cardioplegia modules	BEFORE STARTING CPB
Working properly Emergency lamp working properly Replacement lamp working and available	Corrected perfusate Air and O2 lines connected Gas line connected and tested
STERILITY	No leaks in the circuit
 Table Fields Compresses Pack Scissors CPB Material (Oxygenator and accessories) Syringes and needles Drugs and supplies 	 Rectal thermometer connected and tested Urine bottle positioned Ice bags in the room Hemocron slides in the room Support equipment connected
Lorend	
Legenu:	

BS = Body surface

Matching

-Information missing or not matching

Fig. 2 - Checklist of cardiopulmonary bypass previously checked by perfusionist

PERFUSION RECORD - PEDIATRIC

Name:									17.	5	areas		
D 1								DATE:	/	1	N°.:		
Record:								AGE:		CONV:			
						GENDER: () F			()M				
Diagnosis	3:												
MATERL	ALS USE	D									1		
() Adult	MO			() Pediate	ric MO	()	Infant MO	<u> </u>	-	() Neonate M	0 Braile: ()		
() Card	iotomy Re	eservoir		() Tubing	Pack	()	Cardioplegia	Reservoir (I	NCOR)		Other: ()		
() Venor	us Reserv	oir	_	() Arteria	l Filter							_	
Arterial L	line:	1/4"	3/8"	3/16"		Perfusion	: Aortic	: ()	Femora	al ()	- CANNI	ПА	
Venous L	ine:	1/4"	3/8"	1/2"	3/16"	Drainage:	Togethe	er ()	Separa	ate ()	- Crutito	OLIN	
Rubber:		3/8"	1/2 ''	1/4"		DRUGS I	JSED		Sodium	bicarbonate:		ml	
	1	PERFUSAT	ΓE		SABO	Heparin:		ml	Antibioti	cs:		amp	
Ringer:		ml +			AB	0.5 Vitan	iin C:	ml	Calcium			ml	
Blood:		ml +			0	20% Mannitol: ml 5			50% Gli	0% Glucose: ml			
Plasma:		ml +			A	Regular Insulin: UI Ma			Magnesi	gnesium Sulfate: ml			
Albumin:	1	ml			В	2% Xyloc	aine:	ml	Other:				
		INFUSIO	N			Lasix:		ml					
Outset				Normothern	nia ()	Weight:	Kg	Diur	esis		Balance		
Final				Moderate h	ур. ()	Height:	m		ml	Blood:		ml + -	
Total				Profound h	ур. ()	BS:	m2	A AI	Ver	Fluid:		ml + -	
	1	PRESSURE	ES				TE	MPERATUR	ES		NOTES		
HORA	ART.	VEN.	VEN.	FLUXO	OXIG.	FIO2	PETAL	NASO	TCA	CA	ARDIAC ARRES	ST	
	SUP.	SUP.	INF.	L/min	L	%	KETAL	FARING	ICA	Clamping			
Before				-	-					Opening			
00				2	2	125				Total			
05										A	NOXIA TIME		
10										1°			
20										2°			
30										3°			
40										4°			
50										5°			
60										Total			
70										0	CARDIOPLEGL	A	
80										Induction		ml	
90										Maint. 1		ml	
100										Maint. 2		ml	
110										Maint. 3	· · · · · · · · · · · · · · · · · · ·	ml	
120						-				Maint. 4		ml	
130										Maint. 5		ml	
140										Total		ml	
150										CIRC	ULATORY ARE	REST	
160										Total			
170										CRA	-		
180										H	IEMATOCRIT		
190										Initial		%	
200										Heating		%	
210										Hemocon.	() Yes /	()No	
220										Vol. Out		ml	
230										HT after CPB	5	%	
Surgery p	performed	:								SE	ERIAL NUMBE	R	
										Oxygenation	n:		
										Arterial Bloc	od Filter:		
Notes:									Perfusio	nist:			

Fig. 3 - Model of Pediatric Perfusion Form used for cardiopulmonary bypass

operating room, representing safety in the workplace for patients and professionals.

The video of this article is self explanatory and shows one of the routines that we use and believe that helps to prevent gaps in child care, allowing real and effective continuity during the treatment of heart defect in the preoperative, intraoperative and immediate postoperative period in Intensive Care Unit (ICU).

Determining a surgeon, an anesthetist and an instrumentist to be responsible for implementing the checklist is the first steps to success and adherence to all the team. Also, a large poster shall be posted on the wall of the operating room, so that at the time of completing the checklist no item is forgotten. The key word is: communication.

We believe that the checklist is easy to use, prevents errors and improves patient safety.

We expect all services in Brazil can use this process, which, as already demonstrated by the World Health Organization, saves lives and can be another tool to improve the situation of pediatric cardiac surgery in Brazil [3,4].

VIDEO DESCRIPTION

The checklist is basically divided into four parts: before induction of anesthesia, before skin incision, after the operation and during the passage of the operation performed to the ICU team (Figure 1).

PART I - PRIOR TO INDUCTION

The anesthesiologist and circulating nurse confirm together the patient data, the site of operation, the procedure to be performed, drug allergies, plan to keep the patient warm and the need for blood in the operating room.

The anesthesiologist talks about intubation and venous access.

PART II - BEFORE THE SKIN INCISION

All team members present themselves by name and what role should play during the procedure.

The surgeon again confirms the patient's name, location and type of operation. He explains the most important tests, verifies that all materials and equipment needed are available, time expected for the procedure and the need for prostheses.

The perfusionist confirms details of cannulation, the minimum temperature during cardiopulmonary bypass, cardioplegia, need for circulatory arrest and other details necessary for adequate and safe perfusion, and may use a checklist of proper perfusion (Figure 2), different perfusion record should be completed during the procedure (Figure 3).

The anesthesiologist confirms antibiotic administration and maintenance, the proper functioning of cardiac defibrillation paddles and drug infusion pumps.

The circulating nurse confirms that all necessary materials are in the room.

Thus, all being in agreement and aware of the procedure, the start of the operation is authorized simultaneously by the team.

PART III - AFTER THE END OF THE SURGERY

The surgeon, instrumentist and circulating nurse, together with staff confirms the procedure that has been performed and make the conference of gauze and other materials.

PART IV - PASSAGE OF THE CASE TO ICU

In the ICU, the surgeon explains to the whole team he is receiving the patient with the surgery performed, possible complications and risks.

The anesthesiologist explains the care with ventilation, drug administration, hemodynamic stability, echocardiogram findings - when performed in the operating room -, availability of blood products and other data he may consider important.

The surgeon, anesthesiologist, intensivist, physiotherapist and nurses together discuss the case of the patient and do the planning for the first 24 hours in the ICU.

Thus, the checklist for pediatric cardiac surgery is conclude.

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