



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

Ulisses Alexandre Croti¹, Kathy J. Jenkins², Domingo Marcolino Braile¹

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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 from 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

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.

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

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

1. São José do Rio Preto Pediatric Cardiovascular Surgery Service - Hospital de Base - São José do Rio Preto Medical School, SP, Brazil.
2. São José do Rio Preto Medical School, SP, Brazil. Children's Hospital Boston - Harvard Medical School, Boston, MA, USA.

Correspondence address: Ulisses Alexandre Croti
Hospital de Base - Faculdade de Medicina de São José do Rio Preto (FAMERP) - Avenida Brigadeiro Faria Lima, 5544 - São José do Rio Preto, SP, Brasil - CEP 15090-000.
E-mail: uacroti@uol.com.br

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Checklist for pediatric cardiac surgery

Before Induction SIGN IN	<p>Anesthesiologist and circulator together confirm:</p> <ul style="list-style-type: none"> - Patient data - Place of operation - Procedure to be performed - Allergy to drugs - Plan for keeping the patient warm - Need for blood products: <p>If yes, has the blood bank been notified?</p> <p>The anesthesiologist confirms:</p> <ul style="list-style-type: none"> - Venous access is suitable for the operation? What will be needed? - Possibility of difficulty intubation airway/aspilation? <p>If yes, what's the approach?</p>
Before skin incision ATTENTION ALL	<p>All team members introduced themselves by name and role in the surgery</p> <p>The surgeon confirms:</p> <ul style="list-style-type: none"> - 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? <p>The perfusionist confirms:</p> <ul style="list-style-type: none"> - Details on cannulation - Minimum CPB temperature - Cardioplegia - Need for selective cerebral perfusion and/or cerebral cooling with ice - Need for circulatory arrest, shunt, collateral arteries, procedures to air removal <p>The anesthesiologist confirms:</p> <ul style="list-style-type: none"> - 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? <p>The circulator confirms:</p> <ul style="list-style-type: none"> - Prostheses and other materials in the operating room <div style="text-align: center;">  <p>ALL TEAMS SHOULD AUTHORIZE STARTING THE OPERATION</p> </div>
After completion of the operation SIGN OUT	<p>The surgeon, instrumentist and circulator together confirm:</p> <ul style="list-style-type: none"> - The surgical procedure performed - Counting of gauze, needles and other materials <div style="text-align: center; background-color: #800000; color: white; padding: 5px; margin: 10px 0;"> HANDOVER TO ICU </div> <p>The surgeon explains:</p> <ul style="list-style-type: none"> - The operation performed - Possible risks and complications <p>The anesthesiologist explains:</p> <ul style="list-style-type: none"> - Mechanical ventilation care - Hemodynamic stability and pressure support - Transesophageal echocardiographic findings - Availability of blood products - Other surgery details <p style="text-align: center;">Surgeon, anesthesiologists and intensivists discuss the need for testing and parameters to be controlled in the next 24 hours in ICU</p>

Fig. 1 - Checklist for pediatric cardiac surgery adapted from the International Quality Improvement Collaborative for Congenital Heart Surgery in Developing Countries

FUNDAÇÃO FACULDADE REGIONAL DE MEDICINA DE SÃO JOSÉ DO RIO PRETO

CHECKLIST – CARDIOPULMONARY BYPASS

Date: 25 / 07 / 11

Patient: maria cecilia Rosa Oliveira

Perfusionist:

Rafael S. Policarpo
SBCEC nº 345

Renata
Renata G. Finoti
SBCEC nº 143

PATIENT

- Diagnosis CIV
- Surgery to be performed Ventriculoplasty
- Weight 7.60 kg
- Height 84 cm
- Picture information
(heparin dose, BM, valve diameters and cannulas)
- Heart rate 134 BPM
- Blood group O+
- Pre-CPB urine 50ml

EQUIPMENT

- Air and O2 Pressure Reducers
- 220V outlets
- Heart Lung Machine battery
- CPB Pressure Monitor
- Patient Pressure Monitor
- Thermometer Battery
- CPB and Cardioplegia modules working properly
- Emergency lamp working properly
- Replacement lamp working and available

STERILITY

- Table Fields
- Compresses Pack
- Scissors
- CPB Material (Oxygenator and accessories)
- Syringes and needles
- Drugs and supplies

CIRCUIT PREPARATION

- 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 confer with the patient's data

PERFUSATE COMPOSITION

- Crystalloid 400ml
- Blood Products 100ml sangue
- Heparin 0.6ml
- Bicarbonate 15ml
- Mannitol 40ml

BEFORE STARTING CPB

- Corrected perfusate
- Air and O2 lines connected
- Gas line connected and tested
- Perfusate heated
- No leaks in the circuit
- Rectal thermometer connected and tested
- Urine bottle positioned
- Ice bags in the room
- Hemocron slides in the room
- Support equipment connected

Legend:

BS = Body surface

Matching

Information missing or not matching

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

PERFUSION RECORD - PEDIATRIC

Name:										DATE: / /		N°:					
Record:										AGE:		CONV:					
										GENDER: () F () M							
Diagnosis:																	
MATERIALS USED																	
() Adult MO				() Pediatric MO				() Infant MO				() Neonate MO		Braile: ()			
() Cardiotomy Reservoir				() Tubing Pack				() Cardioplegia Reservoir (INCOR)				Other: ()					
() Venous Reservoir				() Arterial Filter													
Arterial Line:		1/4"		3/8"		3/16"		Perfusion: Aortic ()		Femoral ()		← CANNULA					
Venous Line:		1/4"		3/8"		1/2"		3/16"		Drainage: Together ()		Separate ()					
Rubber:		3/8"		1/2"		1/4"		DRUGS USED		Sodium bicarbonate:		ml					
PERFUSATE				SABO				Heparin:		ml		Antibiotics:		amp			
Ringer:		ml +		AB		0.5 Vitamin C:		ml		Calcium:		ml					
Blood:		ml +		O		20% Mannitol:		ml		50% Glucose:		ml					
Plasma:		ml +		A		Regular Insulin:		UI		Magnesium Sulfate:		ml					
Albumin:		ml		B		2% Xylocaine:		ml		Other:							
INFUSION																	
Outset						Normothermia ()		Weight: Kg		Diuresis		Balance					
Final						Moderate hyp. ()		Height: m		ml		Blood: ml + -					
Total						Profound hyp. ()		BS: m2		A AI Ver		Fluid: ml + -					
HORA																	
PRESSURES			FLUXO			OXIG.			FIO2			TEMPERATURES			NOTES		
	ART. SUP.	VEN. SUP.	VEN. INF.	L/min	L	%	RETAL	NASO FARING	TCA								
Before				-	-	-											
00				-	-	-											
05																	
10																	
20																	
30																	
40																	
50																	
60																	
70																	
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130																	
140																	
150																	
160																	
170																	
180																	
190																	
200																	
210																	
220																	
230																	
Surgery performed:										SERIAL NUMBER							
										Oxygenation:							
										Arterial Blood Filter:							
Notes:										Perfusionist:							

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, intensivists, 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 concluded.

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