Perfusion for Congenital Heart Surgery. Notes on Cardiopulmonary Bypass for a Complex Patient Population

Description: The art and science of providing perfusion for patients undergoing surgical correction of congenital heart lesions has advanced rapidly in the last decade. The complex equipment, the unique acid–base management strategies, the specialized perfusion and ultrafiltration techniques, the wide variation in patient age, size, and vulnerability to physiologic trespass, and the wide variety of surgical procedures performed sets perfusion for congenital heart surgery apart from that provided for correction of acquired heart disease in adults. Consequently, provision of cardiopulmonary support for repair of congenital heart lesions has become a distinct specialty.

Perfusion for Congenital Heart Surgery provides an invaluable road map for the pediatric perfusionist and non–perfusionist caring for patients with congenital heart disease in order to confidently devise a plan for a pump run. The easily referenced information and reminders, not currently readily available in any other publication, can be used to influence a bypass plan and form an essential resource for perfusionists, anesthesiologists, intensivists and other clinicians caring for patients with congenital heart disease.

This practical, spiral–bound, go–to reference is designed to answer the most frequently–posed questions about bypass for CHD, the surgical treatment of which is often complicated, with some conditions seen only rarely in practice.

Perfusion for Congenital Heart Surgery is written and designed for regular use:

- Focuses on the latest devices and techniques and provides clear, matter–of–fact guidance on their roles and importance to CHD procedures
- Written by a seasoned perfusionist who is co–chief and educator at one of the world’s leading children’s hospitals
- The spiral binding allows the book to be laid flat for easy referral
- A Notes section, following the discussion of each CHD lesion, enables readers to add institution and/or surgeon–specific information for later reference

Contents:

Foreword x
Preface xi
Acknowledgments xii
1 Equipment for bypass 1
Oxygenators 1
Arterial line filters 12
Tubing packs 13
Cardioplegia systems 16
The heart lung machine 17
The heater–cooler system 19
Cannulae 20
2 Priming the bypass circuit 27
Prime constituents 27
Steps for priming 28
3 The bypass plan 33
Communication agreement for case 33
Anticoagulation management 35
Blood gas management 40
Carbon dioxide management 40
Oxygenation strategy 42
Hematocrit management 45
Blood pressure management 47
Temperature management 49
Flow rates regional perfusion and hypothermic circulatory arrest 52
Methods of ultrafiltration 55
Before bypass 55
On bypass 55
After bypass 56
SMUF specifications 59
Standard and augmented venous return 60
Standard venous return with gravity siphon drainage 60
Augmented venous return 60
The prebypass checklist 63
The surgical safety checklist for congenital heart surgery 65
4 Typical phases of cardiopulmonary bypass 72
Commencement of bypass 72
Standard support phase of bypass 74
Termination of bypass 76
Post bypass 78
5 Additional notes based on bypass tasks 79
Prebypass 79
Heart lung machine (HLM) 79
Reoperations 79
Cannulation 79
Transfusion during cannulation 80
On bypass 80
Verification of adequate drainage when caval tapes are used 80
Blood gas management 80
Cardioplegia delivery 81
Planned circulatory arrest 81
Induced ventricular fibrillation 82
Administration of blood products 82
Atrial line placement 82
LV vent placement 83
Bed rotation during bypass 83
6 Bypass considerations based on diagnosis 85
Anomalous coronary arteries 86
Aortic regurgitation/insufficiency 89
Aortic stenosis 91
Aortopulmonary collaterals 93
Aortopulmonary window 95
Atrial septal defect 96
Cardiomyopathy requiring orthotopic heart transplantation 99
Coarctation of the aorta 100
Common atroventricular canal defect 102
Cor triatriatum 104
Corrected transposition of the great arteries (L-TGA Levo–TGA or C–TGA) or congenitally corrected TGA 105
Critical aortic stenosis 107
Double chambered right ventricle 109
Double inlet left ventricle 110
Double outlet left ventricle 111
Double outlet right ventricle 112
Ebstein's anomaly 113
Hypoplastic left heart syndrome 114
Stage 1 (Norwood) procedure 115
Hybrid stage 1 palliation 117
Stage 2 or bidirectional Glenn shunt
Fontan procedure (total cavopulmonary anastomosis)
Interrupted aortic arch
Left superior vena cava
Lung transplantation
Mitral regurgitation/insufficiency
Mitral stenosis
Patent ductus arteriosus
Pulmonary artery abnormalities
Pulmonary atresia
Pulmonary atresia with an intact ventricular septum
Pulmonary atresia with ventricular septal defect
Pulmonary regurgitation/insufficiency
Pulmonary stenosis
Pulmonary vein stenosis or pulmonary venous obstruction
Tetralogy of Fallot
Total anomalous pulmonary venous return and partial anomalous pulmonary venous return
d-Transposition of the great arteries
Tricuspid atresia
Tricuspid regurgitation/insufficiency
Truncus arteriosus
Ventricular septal defect
7 Notes on select issues during bypass
Blood pressure higher than expected
Blood pressure lower than expected
Bypass circuit pressure higher than expected
Bypass circuit pressure lower than expected
Central venous pressure elevated
Heat exchange issue (slow cooling or warming)
NIRS values lower than expected
PaCO2 higher than expected
PaCO2 lower than expected 159
PaO2 lower than expected 160
Reservoir volume acutely low 161

8 Notes on select emergency procedures during bypass 163
Arterial pump failure (roller head) 164
Failure to oxygenate 165
Massive air embolization 166
Acute aortic dissection at the initiation of bypass 168
Venous air lock 169
Inadvertent arterial decannulation 170
Inadvertent venous decannulation 171

9 Brief overview of named procedures and terms 172
Alfieri stitch 172
Batista procedure 172
Bentall procedure 172
Bidirectional Glenn shunt 172
Blalock–Hanlon procedure 172
Blalock–Taussig shunt (BTS) 173
Brock procedure 173
Central shunt 173
Cone procedure 173
Cox maze procedure 173
Damus–Kaye–Stansel anastomosis 173
Double switch procedure 173
Fontan procedure 174
Gott shunt 174
Hemi–Fontan procedure 174
Holmes heart 174
Jatene operation 174
Kawasaki disease 174
Kawashima procedure 175
(Diverticulum of) Kommerell 175
12 Comprehensive experience–based equipment selection chart select medications administered during bypass 187

Index 190

Ordering:  
Order Online - [http://www.researchandmarkets.com/reports/3025010/](http://www.researchandmarkets.com/reports/3025010/)

Order by Fax - using the form below

Order by Post - print the order form below and send to

Research and Markets,  
Guinness Centre,  
Taylors Lane,  
Dublin 8,  
Ireland.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct.

Product Name: Perfusion for Congenital Heart Surgery. Notes on Cardiopulmonary Bypass for a Complex Patient Population
Web Address: http://www.researchandmarkets.com/reports/3025010/
Office Code: SC

Product Format
Please select the product format and quantity you require:

Quantity
Hard Copy (Hard Back): USD 189 + USD 31 Shipping/Handling

* Shipping/Handling is only charged once per order.
* The price quoted above is only valid for 30 days. Please submit your order within that time frame to avail of this price as all prices are subject to change.

Contact Information
Please enter all the information below in BLOCK CAPITALS

Title: Mr □ Mrs □ Dr □ Miss □ Ms □ Prof □
First Name: ____________________________ Last Name: ____________________________
Email Address: * ____________________________
Job Title: ____________________________
Organisation: ____________________________
Address: ____________________________
City: ____________________________
Postal / Zip Code: ____________________________
Country: ____________________________
Phone Number: ____________________________
Fax Number: ____________________________

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:
Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by Wire Transfer: Bank details will be provided on the invoice which you will receive after you place your order with us.

If you have a Marketing Code please enter it below:

Marketing Code: ______________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:
(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World