



The Canadian Society  
of Clinical Perfusion

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La Société Canadienne  
de Perfusion Clinique

[cscp.ca](http://cscp.ca)

**NATIONAL CERTIFICATION EXAM**  
**Candidate Manual**



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## GENERAL INFORMATION:

### PURPOSE OF CSCP NATIONAL EXAMINATION

- Accredited and standardized testing that helps ensure competency of each perfusionist that wishes to practice within Canada.
- Highlights knowledge gaps which are then conveyed to the educational programs in order to update curriculum as demographics and clinical practice continue to evolve.

### THE ACE COMMITTEE

- Accreditation, Competency and Examination Committee
- Five or six CSCP certified members representing both pediatric and adult clinical perfusion practice from all regions across Canada.
- Responsible for:
  - Producing, invigilating and scoring the examination
  - Updating references cited for examination questions
  - Managing the examination question bank
  - Ensuring regulatory standards are upheld
  - Maintaining the integrity and standardization of the perfusion community within Canada

## EXAMINATION INFORMATION:

### GENERAL INFORMATION

- Applications will only be accepted for the current examination year.
- Application deadline is July 1<sup>st</sup> of the year a candidate plans on challenging the examination. *Applications sent after July 1<sup>st</sup> will not be accepted. No exceptions.*
- Should a candidate choose to cancel their registration for an examination, they must do so 30 days prior to the examination date. Where extenuating circumstances apply, a candidate may cancel their registration for an examination within 30 days of the examination date; a \$50.00 CAD administrative fee will apply.
- All requests or questions must be sent in writing to the CSCP National Office: [info@cscp.ca](mailto:info@cscp.ca)

### ELIGIBILITY

- All applicants must have graduated from an accredited perfusion program.
- All applicants must be associate members in good standing of the CSCP.



## APPLICATION PROCESS

- Application process is available on the CSCP website. With a candidate's application, a passport quality photo of their face is required, along with official transcripts from the educational program where they completed their perfusion education.
- If a candidate's transcripts are not yet available when submitting their application, the candidate **MUST** submit an official letter from the educational program stating their successful completion of the program. Official transcripts must be submitted as soon as they become available and must be submitted by September 30 deadline or the candidate will not be eligible to write the examination.
- Candidates are responsible for the accurate completion of their CSCP application form. Should a candidate's personal information change after submitting the application form to the CSCP, the candidate must notify the CSCP immediately. If a candidate fails to comply, the CSCP will not be responsible for any communications not received by the candidate.

## EXAMINATION LOCATION

- Rotates between Toronto, Montreal and Vancouver.
- Coincides with the Annual General Meeting and Scientific Sessions of the CSCP.
- The Chair of the ACE Committee will notify candidates once their application has been accepted and approved by the Board of Directors. The location of the examination will also be disclosed with this notification.

## INSTRUCTIONS FOR CANDIDATES

- The examination consists of 180-220 multiple choice questions. Both individual patient and case-based patient questions will be asked.
- Each candidate will have 4.5 hours to complete the examination. No breaks will be permitted during the examination.
- The examination will be presented in a printed booklet. The examination is available in both French and English. English speaking candidates will receive the English examination. French speaking candidates will receive both the French and English examinations, upon request.
- Candidates must answer the examination questions using a separate scantron sheet that will be supplied.
- It is up to each candidate to ensure that the scantron sheet is filled out appropriately within the allotted time for the examination. Additional time will not be permitted for candidates to fill out the scantron sheet. Information written in the examination booklet will not be considered for marks.
- Candidates are reminded to periodically check to make sure their answer on the scantron sheets coincides with the questions in the examination booklet.
- If a candidate decides to change an answer already marked on the scantron sheet, they must either erase or place an "X" over the incorrect answer and indicate their correct answer by filling in the appropriate circle on the scantron sheet.



- Candidates are expected to be at the examination location 20 minutes prior to the examination start time. Government issued ID is required to sign in to the examination; driver's license, passport.
- Instructions will begin 15 minutes prior to the start time.
- If a candidate is less than 30 minutes late, instructions will be given to them outside of the room and no extra time will be allotted to make up for their tardiness.
- If a candidate is more than 30 minutes late, they forfeit their seat and are no longer eligible to write the examination. No reimbursements will be given to a candidate who is late.
- The exact examination location and time will be articulated to all eligible candidates well in advance of the examination date.
- All personal belongings will be placed at the perimeter of the examination room. All cell phones and smart devices must be turned off and kept with personal belongings; smart watches, smart exercise electronics, headphones, etc.
- Snacks are permitted during the examination however be conscientious of the other candidates writing. Noisy and/or aromatic snacks will not be tolerated and will be taken away. Damaged booklets will not be replaced during the examination. If a candidate's scantron sheet is damaged, it is up to the candidate to fill all answers out on a new scantron sheet with no additional time allotted.
- Only basic function calculators are allowed. Programmable calculators are not permitted. Calculators will be provided to those who need one.
- Candidates are responsible for bringing their own writing utensils; pencils, pens, erasers, sharpener, ear plugs.
- All scantron sheets and examination booklets must be returned to the invigilators prior to the candidates exiting the examination room.
- Washroom breaks will be permitted as needed on an individual basis. These breaks will be escorted. No additional time beyond the 4.5 hours will be allotted to those who require washroom breaks.
- Candidates are asked to fill in an evaluation form upon completion of the examination. These forms provide valuable feedback that is utilized to improve the examination and experience. Additional time will be provided at the end of the examination to complete the evaluation.
- Candidates are expected to adhere to the principles of intellectual and academic honesty during the examination.

## RESULTS DELIVERY

- All candidates will receive their results by email within 30 days of writing the examination. Results will also subsequently be sent by registered mail.
- Results will state whether a candidate passed or failed and will be accompanied by the candidate's performance profile to highlight competencies that the candidate answered strongly, as well as the competencies that the candidate answered poorly.



## EXAMINATION PILOT QUESTIONS

- Pilot questions included on the examination are only for statistical information purposes. These questions are not used in calculating a candidate's score.

## ANGOFF METHOD AND PASS SCORE

- The Angoff method is utilized to score each question in the examination question bank. Scores range from 55 to 95. A score < 70 represents a difficult question. A score of 70-80 represents a moderately difficult question. A score > 80 represents an easier question.
- The Angoff score represents the anticipated pass score for each question. For example, an examination question with an Angoff score of 75 would suggest that 75% of the candidates answering that question should get it correct; 25% are anticipated to answer the question incorrectly.
- The overall average of the individual Angoff scores for each question included on the examination represents the pass score for the examination.
- Standardization and accreditation dictate that the Angoff or pass score for the CSCP examination is between 68-72%. An examination that contains more questions with individual Angoff scores of < 70 will result in an examination with an overall Angoff or pass score of 68-70%. An examination that contains more questions with individual Angoff scores of >70 will result in an examination with an overall Angoff or pass score of 70-72%.
- For example, if the Angoff or pass score for an examination is 70 and there are 200 questions on the examination, a candidate must correctly answer 140 questions in order to pass the examination.
- The exact number of questions on the examination and the definitive pass score for the examination change from year to year; 180 – 220 questions with a pass score between 68-72%.

## EXAMINATION SAMPLE QUESTIONS

1. What are the effects of Milrinone (Primacor)?
  - a. Decreased SVR, increased PVR, decreased CO
  - b. Increased SVR, decreased PVR, increased CO
  - c. Increased SVR, increased PVR, decreased CO
  - d. Decreased SVR, decreased PVR, increased CO

Competency Profile Classification: Planning & Clinical Decision Making 03 (PDM03)

Cognitive Domain Classification: Knowledge/Comprehension (K/C)

Angoff Score: 75 (moderately difficult question)

Reference: Hensley, 5<sup>th</sup> Edition, page 44

2. A patient who has A negative blood can receive which of the following blood products?
  - a. A negative RBCs, A negative platelets, AB plasma
  - b. A positive RBC's, A positive platelets, AB plasma
  - c. O negative RBC's, AB positive platelets, A plasma



- d. O positive RBC's, AB negative platelets, A plasma

Competency Profile Classification: Clinical Practice 13 (CP13)

Cognitive Domain Classification: Application (AP)

Angoff Score: 60 (difficult question)

Reference: Canadian Blood Services, Chapter 9: Blood Administration, Table 1 and Table 2.

3. The pressure drop across a patient's ECMO oxygenator has increased from 30 mmHg to 150 mmHg over a period of one hour. What is likely to have caused this and what is the recommended solution?
- Hypovolemia; give volume
  - Arterial cannula obstruction; reposition cannula
  - Clot in the oxygenator; change ECMO circuit
  - Shunting; reduce amount of bridge flow

Competency Profile Classification: Clinical Practice 25 (CP25)

Cognitive Domain Classification: Critical Thinking (CT)

Angoff Score: 80 (easy question)

Reference: ELSO Red Book, 5th Edition, page 71.

## **CSCP POLICY AND PROCEDURE:**

### **ACADEMIC DISHONESTY**

- Copying another candidate's answers.
- Utilizing unauthorized resources; smart gadgets, cheat sheets.

If a candidate is suspected of academic dishonesty, the following procedure will be followed:

1. The invigilators will confidentially communicate the incident to each other.
2. The suspected candidate(s) will be allowed to complete the examination.
3. The suspected candidate(s) will be notified that they have been suspected of academic dishonesty once the examination is complete.
4. If the academic dishonesty included unauthorized materials, said materials will be confiscated; this includes smart devices.
5. The invigilators will fill out a "Notification of Academic Dishonesty Form" and will submit this to the Board of Directors within one day of the incident.
6. The Board of Directors will notify the candidate(s), in writing, of the repercussions within fourteen (14) days of receiving notice of the infraction.
7. The candidate(s) may appeal this decision to the Board of Directors.



## ACCOMMODATION FOR SPECIAL NEEDS

- Candidates with special needs may request special accommodations and arrangements to write the examination. The examination must still be written on the same examination date as all other candidates.
- If a candidate requires accommodation for a physical, cognitive or other special need, they must complete the special accommodation application form and submit this form to the CSCP when applying for the exam. All application and request forms must be submitted to the CSCP by July 1<sup>st</sup> of the year the candidate wants to challenge the examination.
- All requests for special accommodations must be supported with written verification of the nature and extent of the candidate's special needs from a licensed professional.
- In some cases, documentation from the educational institution that the candidate is attending may be required.
- All special accommodation requests are subject to approval by the CSCP Board of Directors on a case by case basis.
- Candidates will be notified by telephone or email what the Board of Directors has decided. A formal letter will follow.
- Subject to review by the CSCP Board of Directors, candidates with approved special accommodations may incur additional charges depending on the nature of the accommodation.
- Criteria taken into account by the CSCP Board of Directors when requests for accommodation are considered include:
  - The needs of the candidate.
  - Preservation of the integrity of the examination.
  - The ability of the CSCP to provide appropriate resources.
- No accommodation request will be granted which jeopardizes the integrity and/or validity of the examination.





### Special Accommodation Application Form

Print or type all information

Name in Full: Mr. Ms. Miss Mrs. (circle)

\_\_\_\_\_  
Surname First Name Middle Initial

\_\_\_\_\_  
Mailing Address

\_\_\_\_\_  
Apt. # City

\_\_\_\_\_  
Province/State Country Postal Code/Zip

\_\_\_\_\_  
Phone Number Email Address

Please indicate the school where you received your Clinical Perfusion Education:

\_\_\_\_\_

All special accommodation requests are subject to approval by the CSCP Board of Directors on a case by case basis.

Candidates will be notified of the decision regarding the request accommodation by telephone or email.

Approved special accommodations will be arranged for the candidate and may incur additional charges.

Please attach a separate sheet that states clearly what specific accommodations and/or arrangements you require.

Before submitting, please ensure that the following are attached (if applicable):

- explanation of need for accommodation
- documentation from a licensed/registered professional
- letter from your educational institution's Special Accommodations Office

\_\_\_\_\_  
Signature Date

SUBMIT TO: CSCP National Office, 914 Adirondack Rd. London, ON. N6K 4W7 [info@cscp.ca](mailto:info@cscp.ca)



## REFERENCE RANGES, CALCULATIONS AND TERMS:

### BLOOD GASES

ADULT BLOOD GAS REFERENCE RANGE			
Parameter	Arterial Range	Venous Range	Units
pH	7.35-7.45	7.30-7.40	
pCO <sub>2</sub>	35-45	40-50	mmHg
pO <sub>2</sub>	80-100	35-40	mmHg
HCO <sub>3</sub> <sup>-</sup>	22-26	22-26	mmol/L
Base Excess	-2 to +2	-2 to +2	mEq/L
SO <sub>2</sub>	93-97	70-75	%

Reference: "Egan's Fundamentals of Respiratory Care, 9th Ed." Wilkins, Stoller, Kacmarek 2009

### BLOOD CHEMISTRY

ADULT BLOOD CHEMISTRY REFERENCE RANGE		
Parameter	Range	Units
Calcium (serum) Total	2.18-2.58	mmol/L
Calcium (serum) Ionized	1.05-1.30	mmol/L
Chloride	98-106	mmol/L
Cholesterol	< 5.2	mmol/L
LDL	< 3.37	mmol/L
HDL	> 0.9	mmol/L
Creatinine (Female)	50-90	µmol/L
Creatinine (Male)	70-120	µmol/L
Glucose (Fasting)	3.3-5.8	mmol
Magnesium	0.75-0.95	mmol/L
Osmolarity	280-300	mmol/kg
Potassium	3.5-5.0	mmol/L
Sodium	135-145	mmol/L
Urea Nitrogen (BUN)	2.5-8.0	mmol/L
Lactate	0.5-2.2	mmol/L

Reference: Medical Council of Canada website:

<http://apps.mcc.ca/ObjectivesOnline/objectives.pl?lang=english&loc=values>



## ENZYMES AND COAGULATION

ADULT ENZYMES AND COAGULATION REFERENCE RANGE		
Parameter	Range	Units
ALT	3-36	U/L
AST	0-35	U/L
Troponin (TnT)	< 0.01	µg/L
International Normalized Ratio (INR)	0.9-1.2	
Partial thromboplastin time (PTT)	28-38	Sec
Prothrombin Time (PT)	10-13	sec
Fibrinogen	1.8-4.0	g/L

Ref: Medical Council of Canada website:

[http://apps.mcc.ca/Objectives\\_Online/objectives.pl?lang=english&loc=values](http://apps.mcc.ca/Objectives_Online/objectives.pl?lang=english&loc=values)

## HEMATOLOGY

ADULT HEMATOLOGY REFERENCE RANGE			
Parameter	Male	Female	Units
Hemoglobin (Hb)	140-174	123-157	g/L
Hematocrit (HCT)	0.42-0.52	0.37-0.46	
Red Blood Cells (RBC)	4.4-5.7	4.0-5.2	$\times 10^{12}/L$
White Blood Cell Count (WBC)	4-10	4-10	$\times 10^9/L$
Platelet Count (Plt)	130-400	130-400	$\times 10^9/L$

Ref: Medical Council of Canada website:

[http://apps.mcc.ca/Objectives\\_Online/objectives.pl?lang=english&loc=values](http://apps.mcc.ca/Objectives_Online/objectives.pl?lang=english&loc=values)

## HEMODYNAMICS

ADULT HEMODYNAMICS REFERENCE RANGE		
Parameter	Range	Units
Systolic Arterial Pressure (SBP)	100-140	mmHg
Diastolic Arterial Pressure (DBP)	60-90	mmHg
Mean Arterial Pressure (MAP)	65-100	mmHg
Pulmonary Artery Systolic Pressure (PAS)	15-30	mmHg
Pulmonary Artery Diastolic Pressure (PAD)	4-12	mmHg
Mean Pulmonary Artery Pressure (MPAP)	9-16	mmHg
Pulmonary Capillary Wedge Pressure (PCWP)	2-12	mmHg
Central Venous Pressure (CVP)	0-8	mmHg
Systemic Vascular Resistance (SVR)	900-1400	$\text{dynes}\cdot\text{sec}\cdot\text{cm}^{-5}$



Pulmonary Vascular Resistance (PVR)	150-250	dynes-sec-cm <sup>-5</sup>
Stroke Volume (SV)	60-130	ml/beat
Heart Rate (HR)	60-100	bpm
Cardiac Output (CO) or Flow (Q)	4-8	LPM
Cardiac Index (CI)	2.5-4	L/min/m <sup>2</sup>
O <sub>2</sub> Consumption (VO <sub>2</sub> )	200-300	ml/min

#### PHYSIOLOGIC CALCULATIONS AND FORMULAS

Parameter	Formula
Cardiac Output (L/min)	CO = HR x SV
Cardiac Index (L/min/m <sup>2</sup> )	CI = CO/BSA
Mean Arterial Pressure (mmHg)	MAP = DBP + 1/3(SBP-DBP)
Systemic Vascular Resistance (mmHg)	SVR = [(MAP-CVP)/CO] x 80
Pulmonary Vascular Resistance (mmHg)	PVR = [(MPAP-PCWP)/CO] x 80
O <sub>2</sub> Consumption Modified Fick (ml/min)	VO <sub>2</sub> = (CaO <sub>2</sub> – CvO <sub>2</sub> ) x Q
Stroke Volume (ml)	SV = CO/HR
Oxygen Delivery DO <sub>2</sub> (ml/min)	DO <sub>2</sub> = CaO <sub>2</sub> x CO
Arterial Oxygen Content CaO <sub>2</sub> (ml/dl)	CaO <sub>2</sub> = (Hb x 1.34 x SaO <sub>2</sub> ) + (PaO <sub>2</sub> x 0.003)
Mixed Venous Oxygen Content CvO <sub>2</sub> (ml/dl)	CvO <sub>2</sub> = (Hb x 1.34 x SvO <sub>2</sub> ) + (PvO <sub>2</sub> x 0.003)
Cerebral Perfusion Pressure CPP (mmHg)	CPP = MAP - CVP
Total Blood Volume TBV	TBV = Patient Weight (kg) x Blood Volume Factor (ml/kg)
Adult Male Blood Volume Factor	70 ml/kg
Adult Female Blood Volume Factor	75 ml/kg
Pediatric Blood Volume Factor	80 ml/kg
Body Surface Area BSA (m <sup>2</sup> )	BSA = √ [(Height(cm) x Weight(kg)) / 3600]
Hematocrit HCT	HCT = RBC / TBV
Hematocrit on CPB	CPB HCT = (Patient HCT x TBV) / (TPV+TBV+Pre-CPB IV fluid)
Red Blood Cells Required	RBC Req. = [(TBV +TPV)x(Desired HCT)] – [(TBV x Patient HCT)]
3/16 inch tubing	5.4 ml/ft
1/4 inch tubing	9.65 ml/ft
3.8 inch tubing	21.71 ml/ft
1/2 inch tubing	38.61 ml/ft

Ref: Brodie, **The Manual of Clinical Perfusion**, 2nd ed., 1997, Glendale Medical Gravlee, **CPB Principles and Practice**, 2nd and 3rd ed., Lippincott, Williams & Wilkins



## ABBREVIATIONS AND SYMBOLS

A			
a	arterial	AIDS	acquired immunodeficiency syndrome
A	alveolar	AP	anterior posterior
ABG	arterial blood gas	ALF	arterial line filter
ACLS	advanced cardiac life support	AR	aortic regurgitation
ACT	activated clotting time	ARDS	adult respiratory distress syndrome
ACS	acute coronary syndrome	AS	aortic stenosis
ADH	antidiuretic hormone	ASD	atrial septal defect
AG	anion gap	ATP	adenosine triphosphate
AI	aortic insufficiency	AV	atrioventricular
AICD	automated implantable cardioverter device	A-V	arterial venous
B			
BCLS	basic cardiac life support	BP	blood pressure
BE	base excess	BSA	body surface area
BMI	body mass index	BUN	blood urea nitrogen
C			
Ca <sup>++</sup>	ionized calcium	COPD	chronic obstructive pulmonary disease
CABG	coronary arterial bypass graft	CPAP	continuous positive airway pressure
CaO <sub>2</sub>	oxygen content of arterial blood	CPB	cardiopulmonary bypass
C(a-v)O <sub>2</sub>	arterial to venous oxygen content difference	CPP	cerebral perfusion pressure
CHF	congestive heart failure	CPR	cardiopulmonary resuscitation
CI	cardiac index	CSCP	Canadian Society of Clinical Perfusion
Cl <sup>-</sup>	chloride	CSF	cerebrospinal fluid
cmH <sub>2</sub> O	centimeters of water pressure	CT	computerized tomography
CNS	central nervous system	CVA	cerebrovascular accident
CO	cardiac output	CvO <sub>2</sub>	oxygen content of mixed venous blood
CO <sub>2</sub>	carbon dioxide	CVP	central venous pressure
COHb	carboxyhemoglobin	CXR	chest x-ray
COP	colloid oncotic pressure		
D			
D5W	5% dextrose in water	DIC	disseminated intravascular coagulation
DHCA	deep hypothermic circulatory arrest	DO <sub>2</sub>	oxygen delivery



E			
ECC	extracorporeal circuit	EEG	electroencephalogram
ECG	electrocardiogram	EF	ejection fraction
ECLS	extracorporeal life support	ER	emergency room/department
ECMO	extracorporeal membrane oxygenation		
F			
FFP	fresh frozen plasma	FiO <sub>2</sub>	fraction of inspired oxygen
FP	frozen plasma	Fr	French (sizes)
G			
g or gm	gram	GME	gaseous microemboli
GI	gastrointestinal	GFR	glomerular filtration rate
H			
HgB or Hb	hemoglobin	HCT	hematocrit
HbCO	carboxyhemoglobin	HIT	heparin induced thrombocytopenia
HbF	fetal hemoglobin	HIV	human immunodeficiency virus
Hbmet	methemoglobin	HLHS	hypoplastic left heart syndrome
HCO <sub>3</sub> <sup>-</sup>	bicarbonate	HR	heart rate
I			
IAB	intraaortic balloon	ICU	intensive care unit
IABP	intraaortic balloon pump	iu	international unit
IBW	ideal body weight	INR	international normalized ratio of prothrombin time
ICD	implantable cardioverter defibrillator	IVC	inferior vena cava
ICP	intracranial pressure		
K			
kg	kilogram	K <sup>+</sup>	potassium
L			
L	litre	LSPV	left superior pulmonary vein
LAD	left anterior descending artery	LSVC	left superior vena cava
LA	left atrium	LV	left ventricle
LAP	left atrial pressure	LVAD	left ventricular assist device
LAFA	left atrial femoral artery (bypass)	LVEDP	left ventricular end diastolic pressure
LHB	left heart bypass	LVSV	left ventricular stroke volume
LPM	litres per minutes	LVSF	left ventricular stroke work
M			
MAC	minimum alveolar concentration	MR	mitral regurgitation
MAP	mean arterial pressure	MUF	modified ultrafiltration
Mg <sup>++</sup>	magnesium	mmol	millimole



MV	mitral valve	mL	millilitre
MI	myocardial infarction	mg	milligram
MIS	minimally invasive surgery	mcg ( $\mu\text{g}$ )	microgram
mmHg	millimetres of mercury pressure (torr)		
<b>N</b>			
Na <sup>+</sup>	sodium	NO <sub>2</sub>	nitrogen dioxide
NaCl	sodium chloride	N <sub>2</sub> O	nitrous oxide
NaHCO <sub>3</sub>	sodium bicarbonate	NS	normal saline
NO	nitric oxide		
<b>O</b>			
O <sub>2</sub>	oxygen	OR	operating room
<b>P</b>			
P	pressure	PG	prostaglandin
P50	partial pressure of oxygen at 50% HbO <sub>2</sub>	pH	standardized hydrogen ion activity
PA	pulmonary artery	PRBC	packed red blood cells
P(A-a)O <sub>2</sub>	alveolar to arterial oxygen gradient	PT	prothrombin time
PAC	pulmonary artery catheter	PTT	partial thromboplastin time
PAP	pulmonary artery pressure	PV	pulmonary valve
PAWP	pulmonary artery wedge pressure	PR	pulmonary regurgitation
PCWP	pulmonary capillary wedge pressure	PVC	premature ventricular contraction
PDA	patent ductus arteriosus	PVR	pulmonary vascular resistance
PEEP	positive end expiratory pressure	PVRI	pulmonary vascular resistance index
PFO	patent foramen ovale		
<b>Q</b>			
Qs/Qt	shunted cardiac output ratio	Qt	total cardiac output
<b>R</b>			
RA	right atrium	RDS	respiratory distress syndrome
RAP	retrograde autologous priming	RPM	revolutions per minute
RBC	red blood cell	RV	right ventricle
RCA	right coronary artery	RVAD	right ventricular assist device
<b>S</b>			
SaO <sub>2</sub>	arterial oxygen saturation	SVC	superior vena cava
STEMI	ST elevation myocardial infarction	SVR	systemic vascular resistance
SvO <sub>2</sub>	venous oxygen saturation	SVRI	systemic vascular resistance index
<b>T</b>			
T	temperature	TPV	total prime volume
TGA	transposition of the great arteries	TR	tricuspid regurgitation
TEG	thromboelastography	TV	tricuspid regurgitation
TMP	transmembrane pressure	TT	thrombin time



TOF	tetralogy of fallot		
<b>V</b>			
V/A	veno-arterial	Vol%	concentration (percent per volume)
VAVD	vacuum assisted venous drainage	VSD	ventricular septal defect
VO <sub>2</sub>	oxygen consumption per minute	V/V	V/V veno-venous
<b>W</b>			
WBC	white blood cell		