

Annette Vegas



**Perioperative
Two-Dimensional
Transesophageal
Echocardiography**
A Practical Handbook

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Dedication

To my parents, Patrick and Lena, and my brother Derek for their love and support throughout my life.

To colleagues at Toronto General Hospital, in particular Dr Christopher Feindel, cardiac surgeon, and Dr Patricia McNama, anesthesiologist, who have been exemplars of professionalism during my career.

Preface

The role of transesophageal echocardiography (TEE) has expanded to become common place during cardiac surgery and in the ICU. Anesthesiologists trained in TEE are increasingly providing this service in both venues. The skills and expertise of the echocardiographer are constantly evolving to provide timely and accurate information. The challenge for the echocardiographer is to integrate many current TEE guidelines into everyday practice. There is a need to have reference material readily at hand to confirm echocardiographic findings. This handbook is created to fulfill the need for an illustrative synopsis of common cardiac pathology encountered in cardiac surgery patients. It is designed to provide a compact portable reference for using TEE to recognize cardiac pathology in the perioperative period. It will appeal to anesthesiologists, cardiac surgeons and cardiologists with a range of experience from novice to expert echocardiographers.

This handbook is a compilation of echocardiography information and TEE images from perioperative TEE studies performed at Toronto General Hospital (TGH), Toronto, Ontario, Canada. As with all written texts it does not do justice to the cardiac activity seen in live TEE. The reader is referred to other sources for video recordings of TEE. The TEE website, <http://pie.med.utoronto.ca/TEE/> developed by the Perioperative Interactive Education (PIE) group at Toronto General Hospital is a rich online resource for TEE educational material. Readers who prefer a more traditional source can view a reference textbook such as Multimedia Transesophageal Echocardiography 2nd Edition (2010) published by Informa Healthcare and edited by Drs Andre Denault, Pierre Couture, Annette Vegas, Jean Buithieu and Jean Claude Tardif.

Learning and practicing echocardiography is a career-long process. In the words of Galileo Galilei, "You cannot teach a man anything; you can only help him to find it for himself." I hope this handbook will help you along your journey.

Dr. Annette Vegas, MD, FRCPC, FASE
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Contents

1 Normal TEE Views.....	1
2 Doppler and Hemodynamics.....	31
3 Ventricles	51
4 Native Valves	77
5 Prosthetic Valves, Transcatheter Valves and Valve Repairs	117
6 Aorta.....	137
7 Congenital Heart Disease	151
8 Variants, Foreign Material, Masses and Endocarditis.....	179
9 Ventricular Assist Devices and Heart Transplantation	199
10 Hypertrophic Obstructive Cardiomyopathy and Diastolic Dysfunction	209
11 Pericardium.....	219
Index.....	229

Abbreviations

A	Anterior
AI	Aortic insufficiency
AL	Anterolateral
AMVL	Anterior mitral valve leaflet
AS	Aortic stenosis
ASD	Atrial septal defect
ASE	American Society of Echocardiography
AV	Aortic valve
AVA	Aortic valve area
AVSD	Atrioventricular septal defect
BAV	Bicuspid aortic valve
BPM	Beats per minute
C	Chamber
CAD	Coronary artery disease
CE	Carpentier-Edwards
CO	Cardiac output
CPB	Cardiopulmonary bypass
CS	Coronary sinus
CSA	Cross sectional area
CVP	Central venous pressure
CW	Continuous wave
Cx	Circumflex artery
DS	Deceleration slope
DT	Deceleration time
DVI	Dimensionless valve index
ED	End diastole
EDA	End diastolic area
EDD	End diastolic diameter
EDP	End diastolic pressure
EDV	End diastolic volume
EF	Ejection fraction
ERO	Effective regurgitant orifice
ES	End systole
ESA	End systolic area
ESD	End systolic diameter
ESV	End systolic volume
FAC	Fractional area change
FS	Fractional shortening
GE	Gastroesophageal

HBP	High blood pressure
HOCM	Hypertrophic obstructive cardiomyopathy
HR	Heart rate
HV	Hepatic vein
I	Inferior
IABP	Intra-aortic balloon pump
IAS	Inter-atrial septum
IHSS	Idiopathic hypertrophic subaortic stenosis
IPPV	Intermittent positive pressure ventilation
IVC	Inferior vena cava
IVRT	Isovolumetric relaxation time
IVS	Interventricular septum
JA	Jet area
JH	Jet height
L	Left or lateral or length
LA	Left atrium
LAA	Left atrial appendage
LAD	Left anterior descending
LAP	Left atrial pressure
LAX	Long axis
LCA	Left coronary artery
LCC	Left coronary cusp
LCCA	Left common carotid artery
LLPV	Left lower pulmonary vein
LUPV	Left upper pulmonary vein
LV	Left ventricle
LVAD	Left ventricular assist device
LVH	Left ventricular hypertrophy
LVID	Left ventricle internal diameter
LVOT	Left ventricular outflow tract
MAC	Mitral annular calcification
MI	Myocardial infarction
MR	Mitral regurgitation
MS	Mitral stenosis
MVA	Mitral valve area
N	Non
NSR	Normal sinus rhythm
P	Pressure or posterior
PA	Pulmonary artery
PAP	Pulmonary artery pressure
PAPVD	Partial anomalous pulmonary venous drainage
PASP	Pulmonary artery systolic pressure
PDA	Patent ductus arteriosus
PFO	Patent foramen ovale
PHT	Pressure half-time
PI	Pulmonic insufficiency