THE UNIVERSITY OF MELBOURNE

Tricuspid Valve Anatomy

Assoc. Prof. Quentin A. Fogg

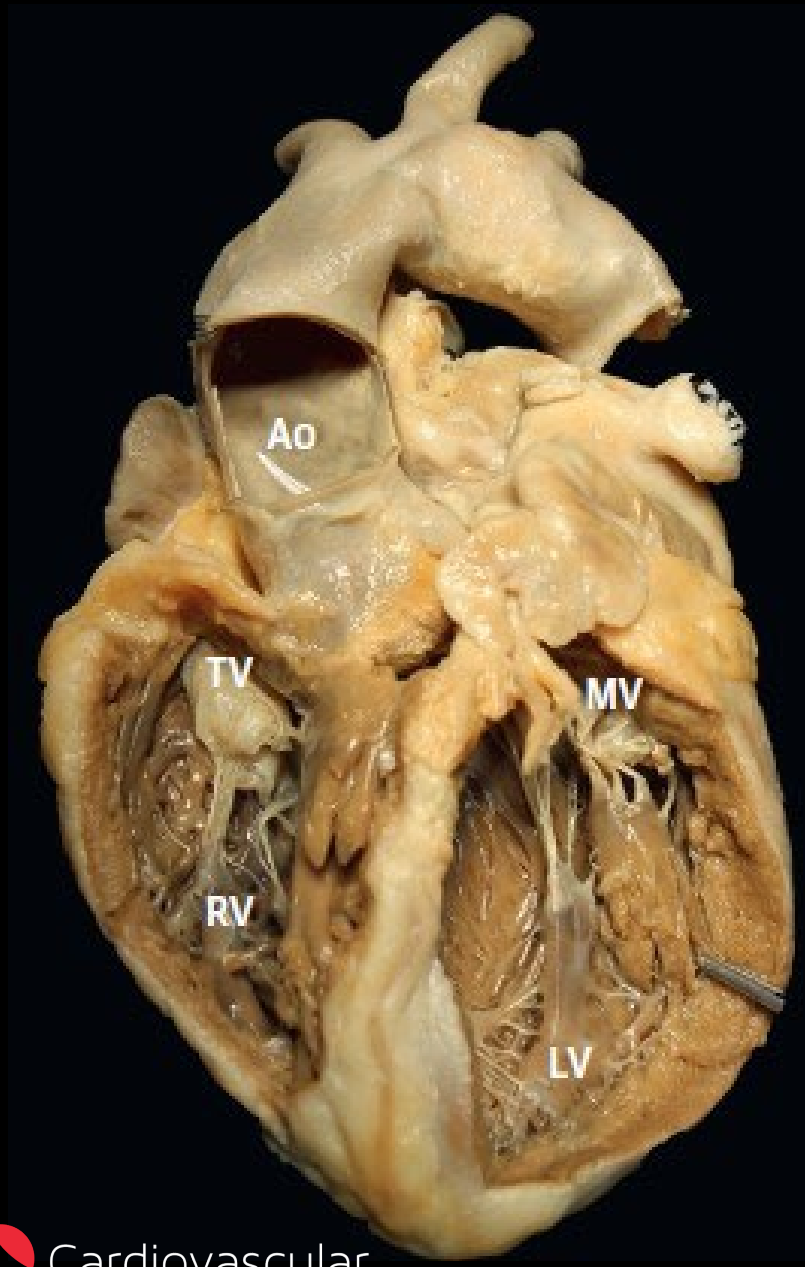
BSc(Hons), PhD, FRCPS(Glasg)

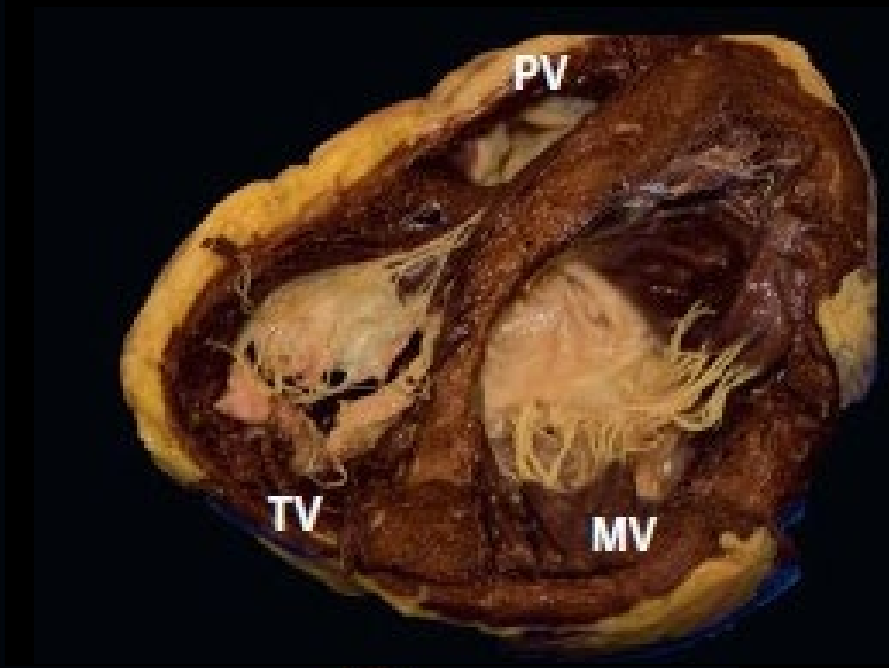
Department of Anatomy and Physiology,
The University of Melbourne

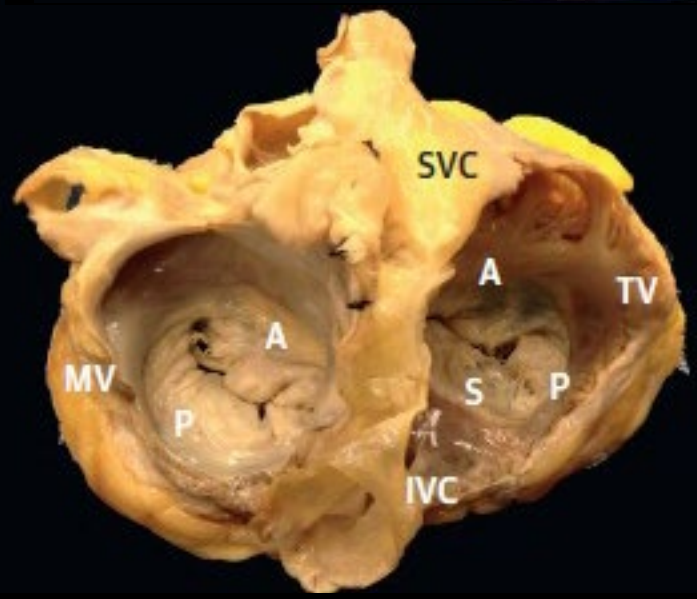
Objectives

This lecture will address the:

- anatomy of the cardiac skeleton
- localisation and arterial supply of the AV node
- tricuspid annulus and leaflets
- tricuspid subvalvular apparatus





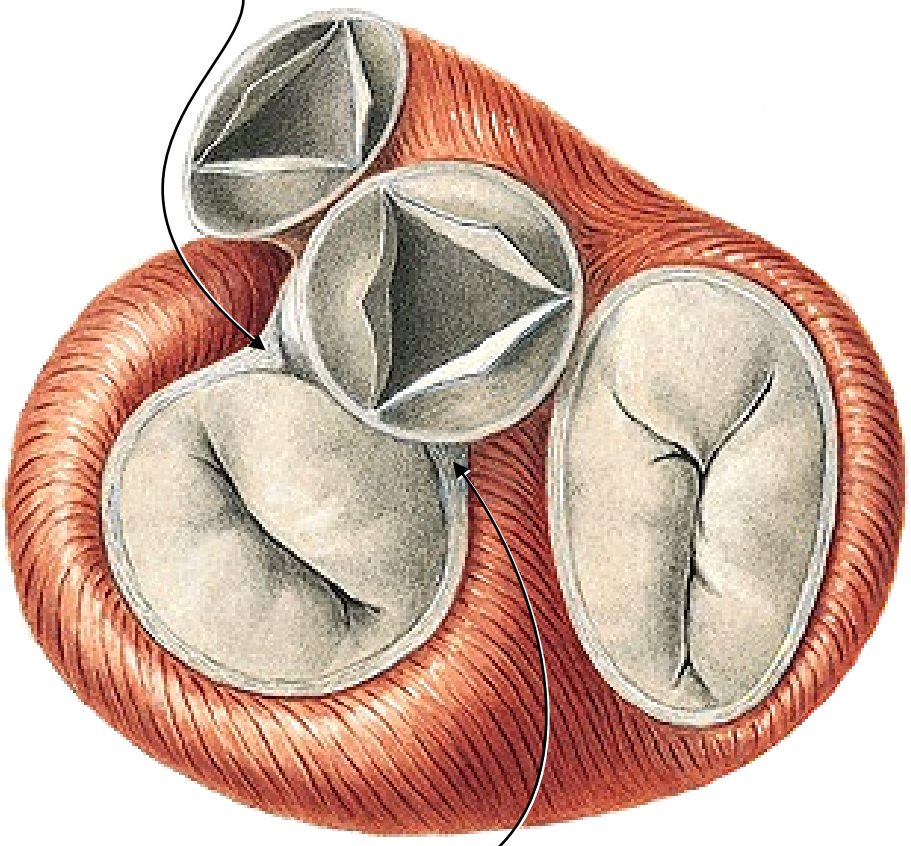


Cardiovascular Research Foundation®

Dahou *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 458-468.

QA Fogg PhD, FRCPS(Glasg)
Associate Professor in Clinical Anatomy, The University of Melbourne

Cardiac Skeleton



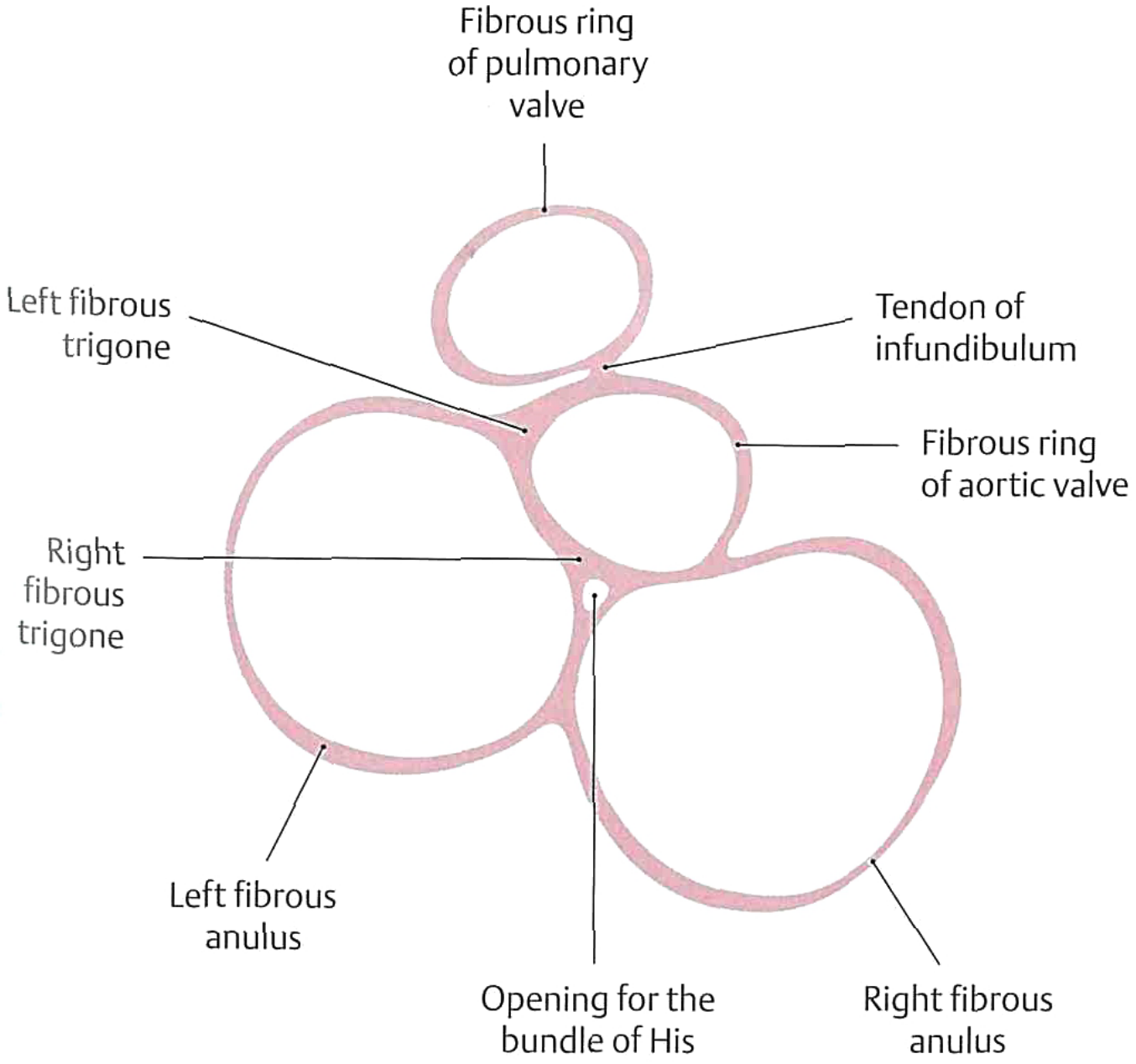
Consists of:

- 4 fibrous annuli
- left fibrous trigone
- right fibrous trigone
  - **<u>OR</u> central fibrous body**
  - atrioventricular node lies "upon it"
- membranous portion of the interventricular septum

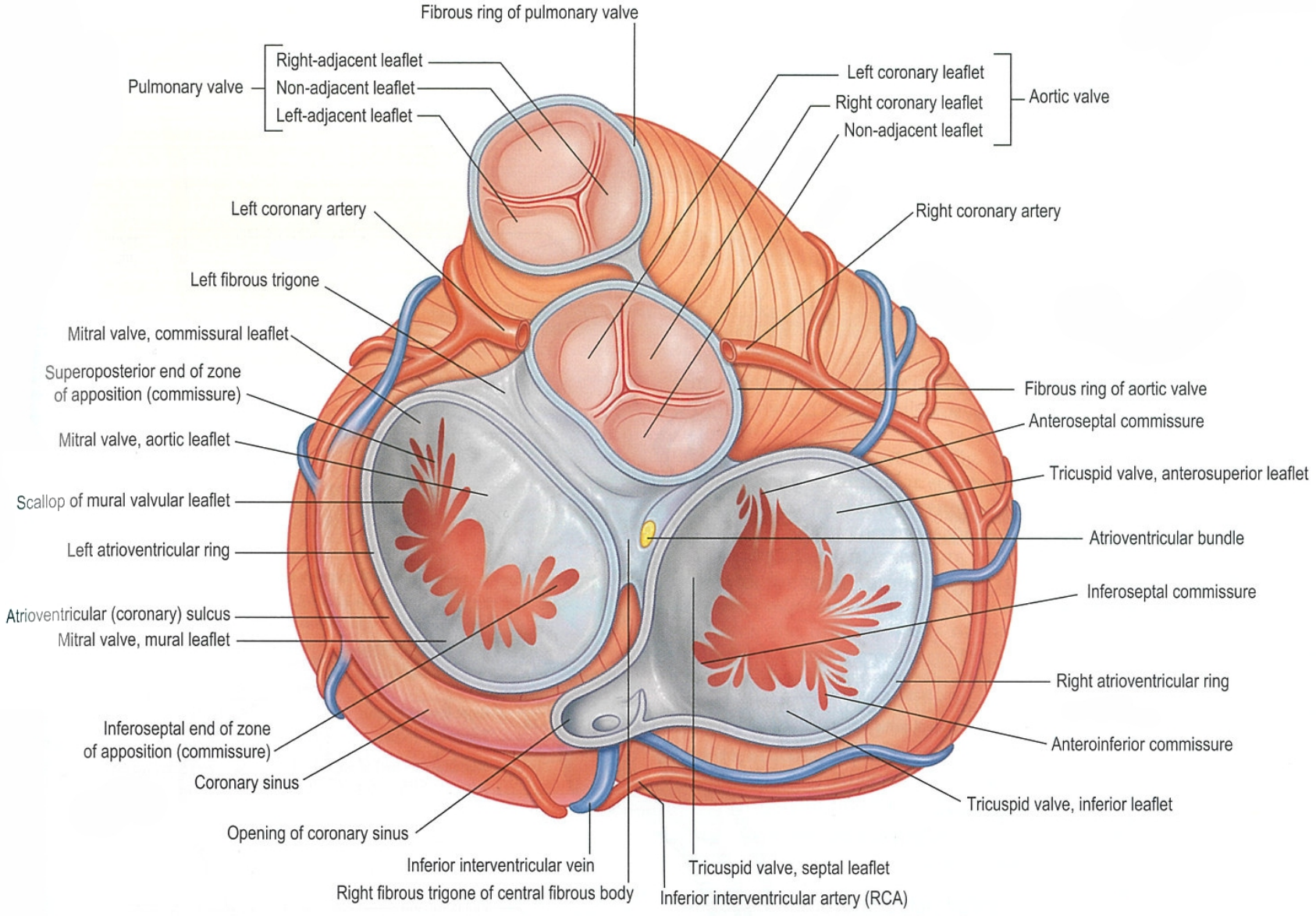
Function:

- attachment of atrial and ventricular myocardium
- electrically & physically separate the atria from the ventricles
- annuli support atrioventricular and semilunar valves

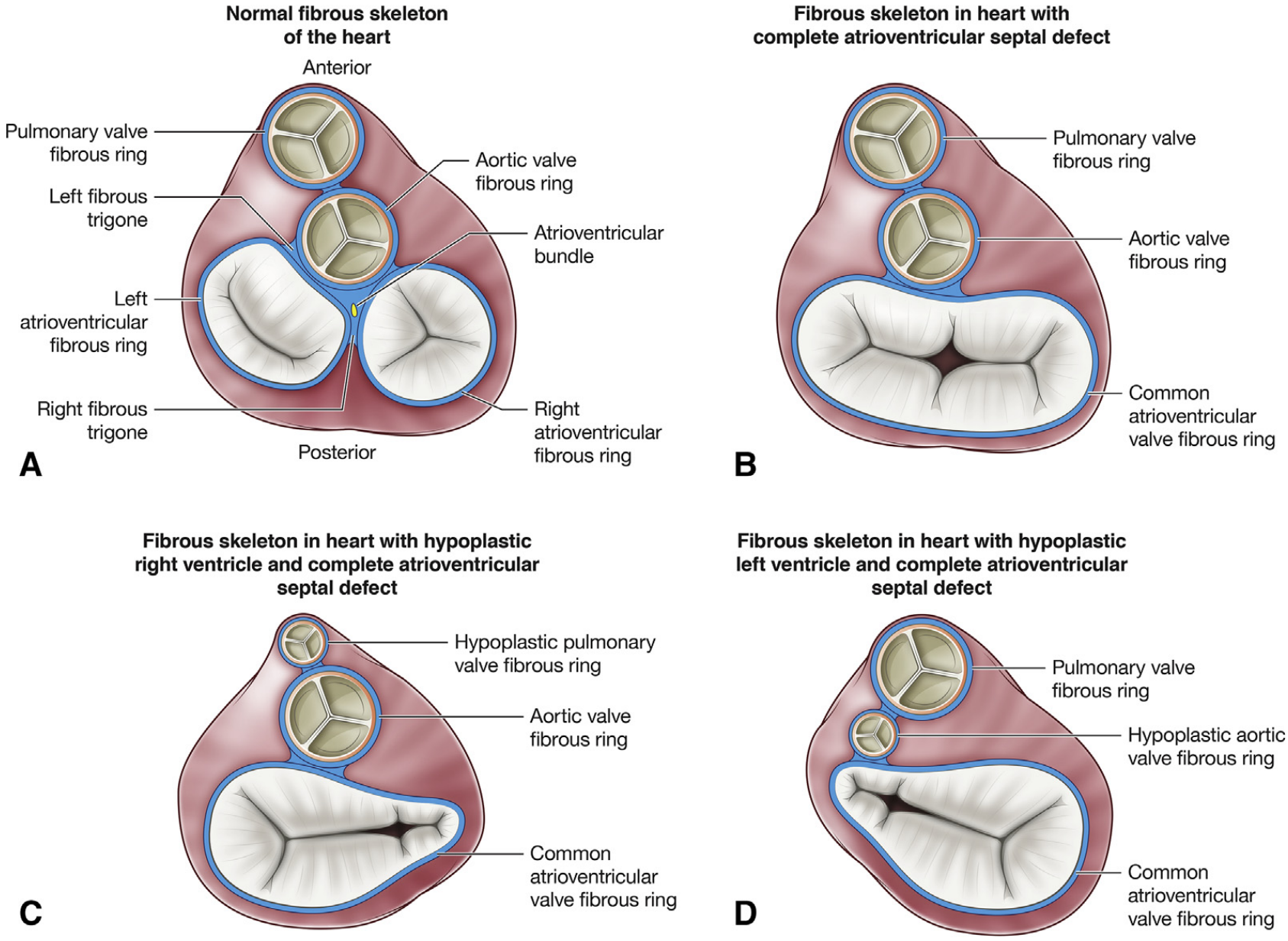
Putz and Pabst (2001) *Sobotta Atlas of Human Anatomy*, *13th Ed.*, Lippincott Williams & Wilkins, Germany.



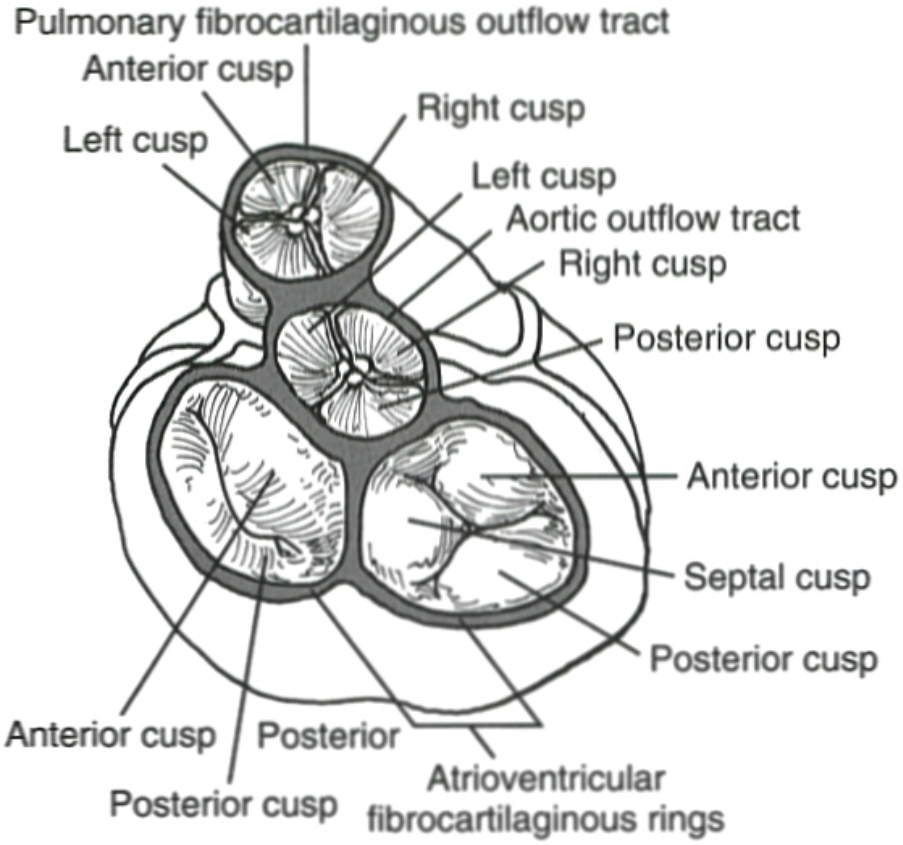
Ross and Lamperti (2006) *Thieme Atlas of Anatomy*, Thieme, Stuttgart, Germany.



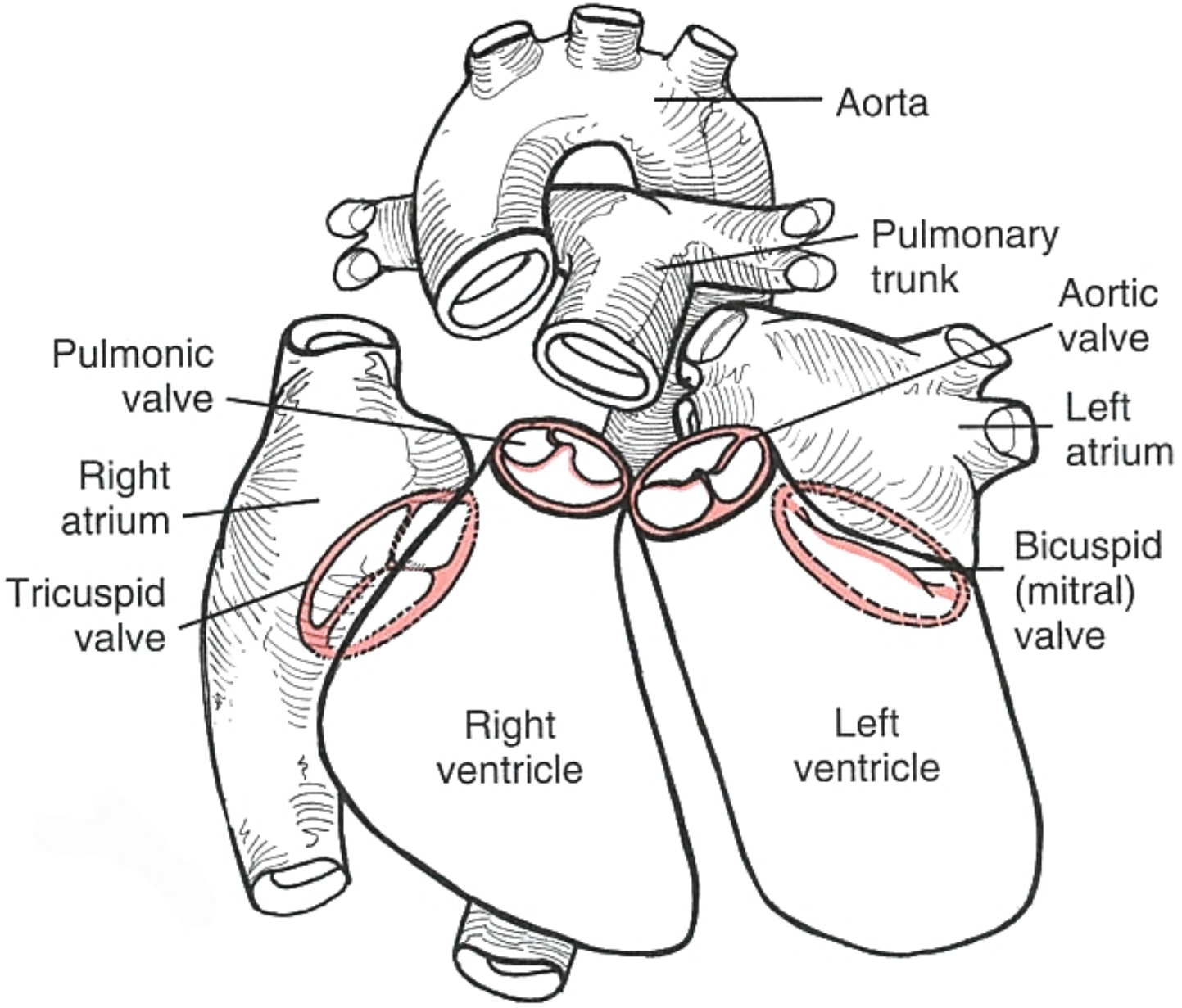
Standring (2021) *Gray's Anatomy, 42nd Edition*. Elsevier, UK.



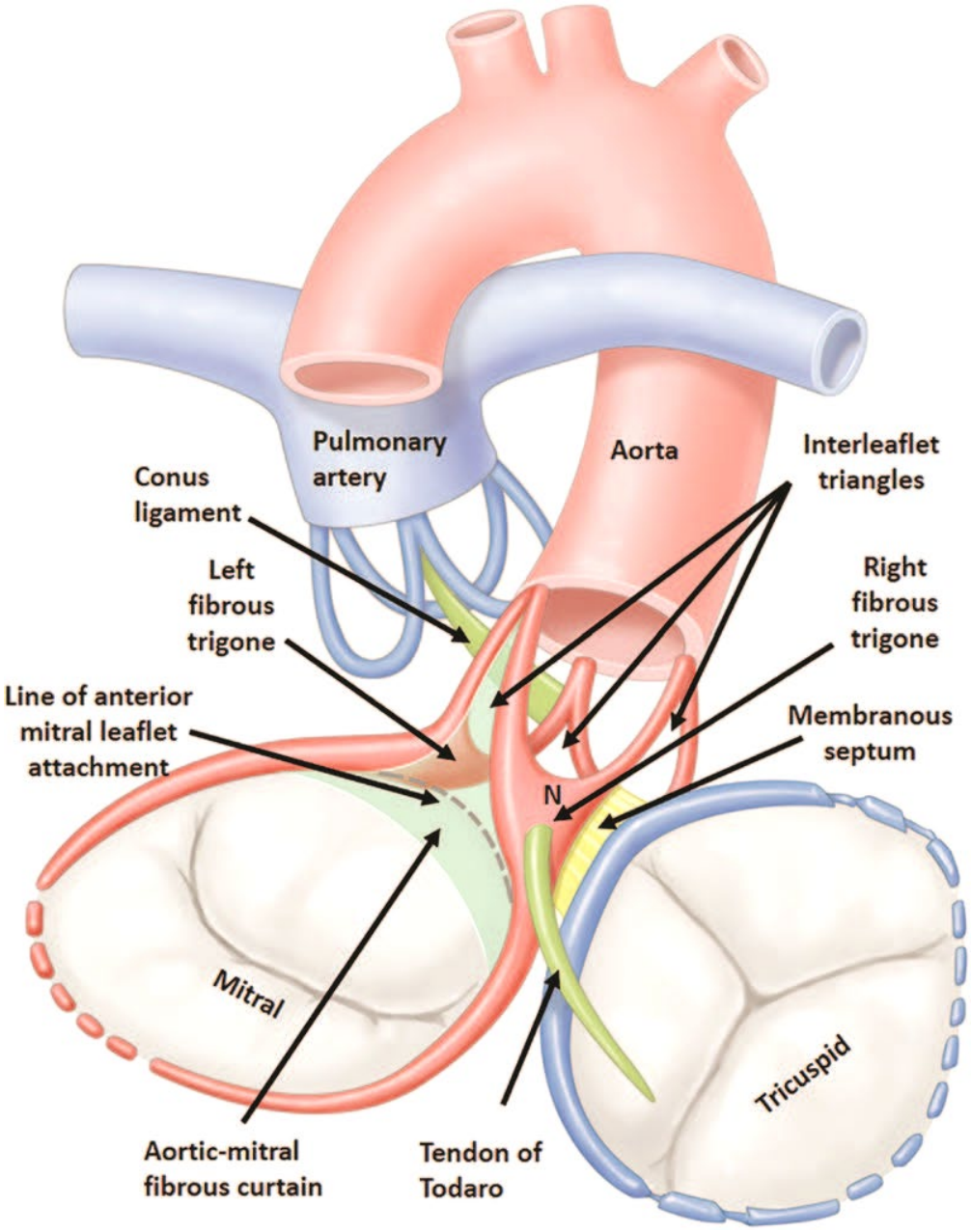
Buratto and Konstantinov (2021) *The Journal of Thoracic and Cardiothoracic Surgery* **162:** 360-365.



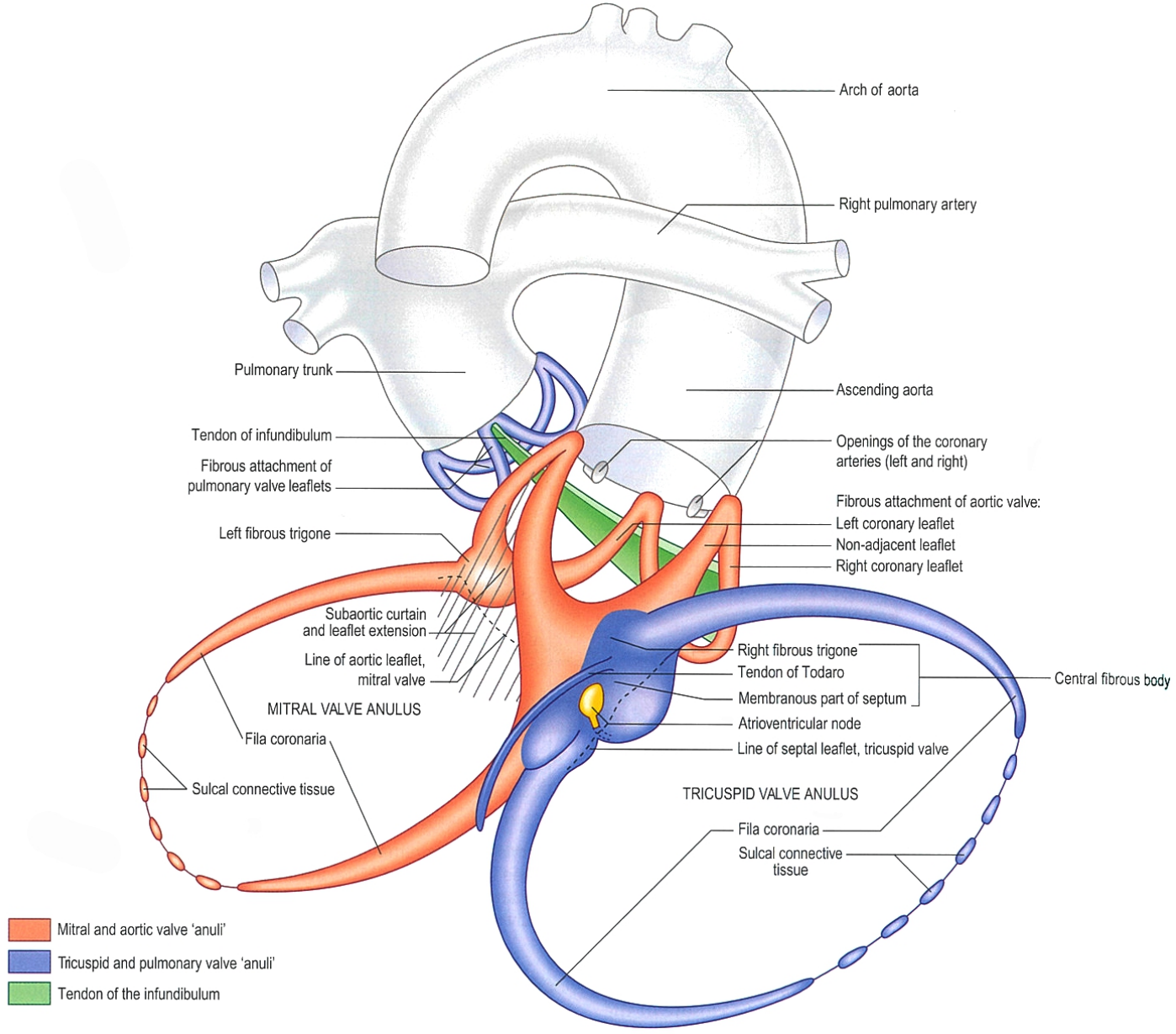
WJ Larsen (2002) *Anatomy: Development, Function, Clinical Correlations*. Saunders, USA.



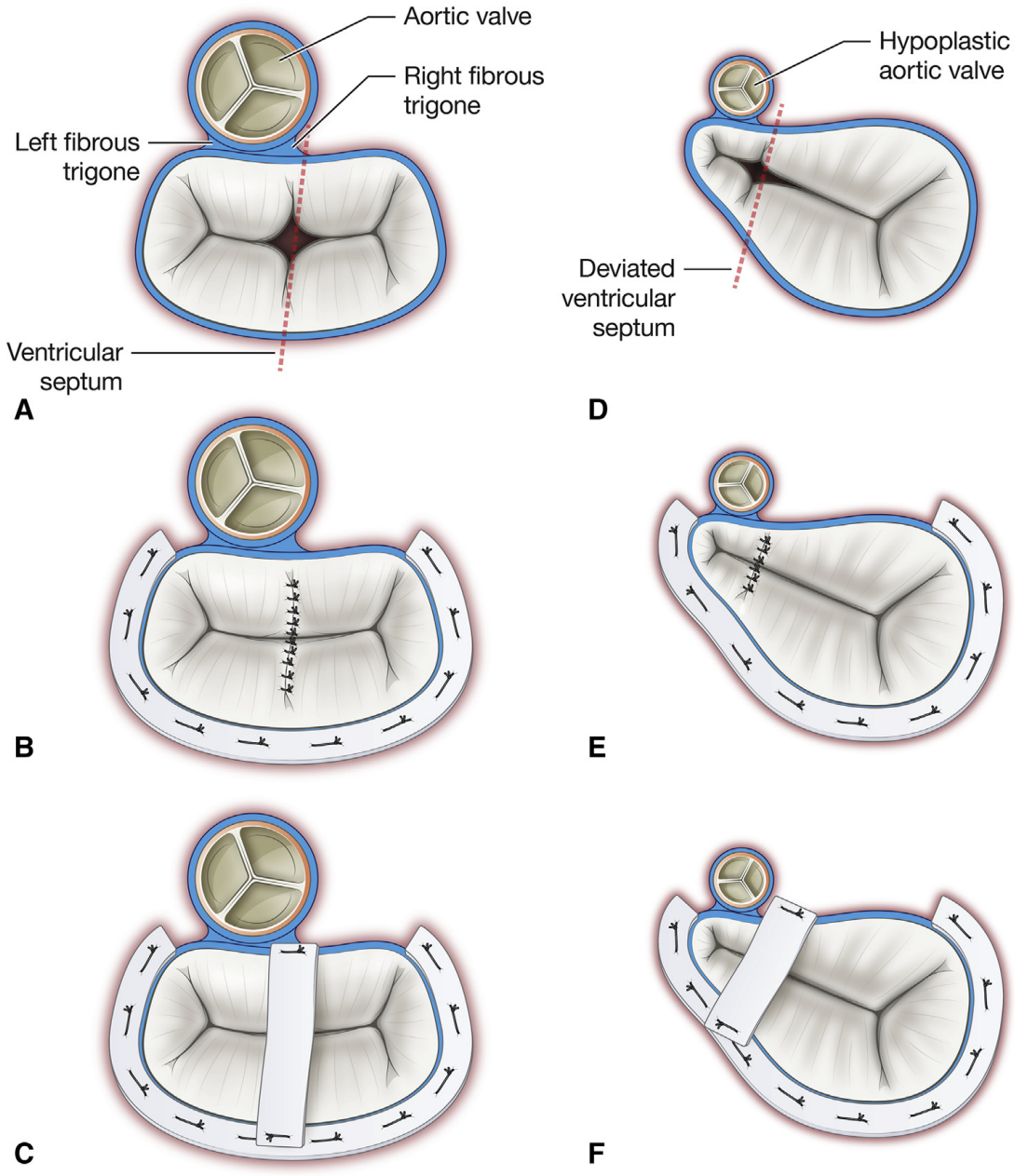
WJ Larsen (2002) *Anatomy: Development, Function, Clinical Correlations*. Saunders, USA.



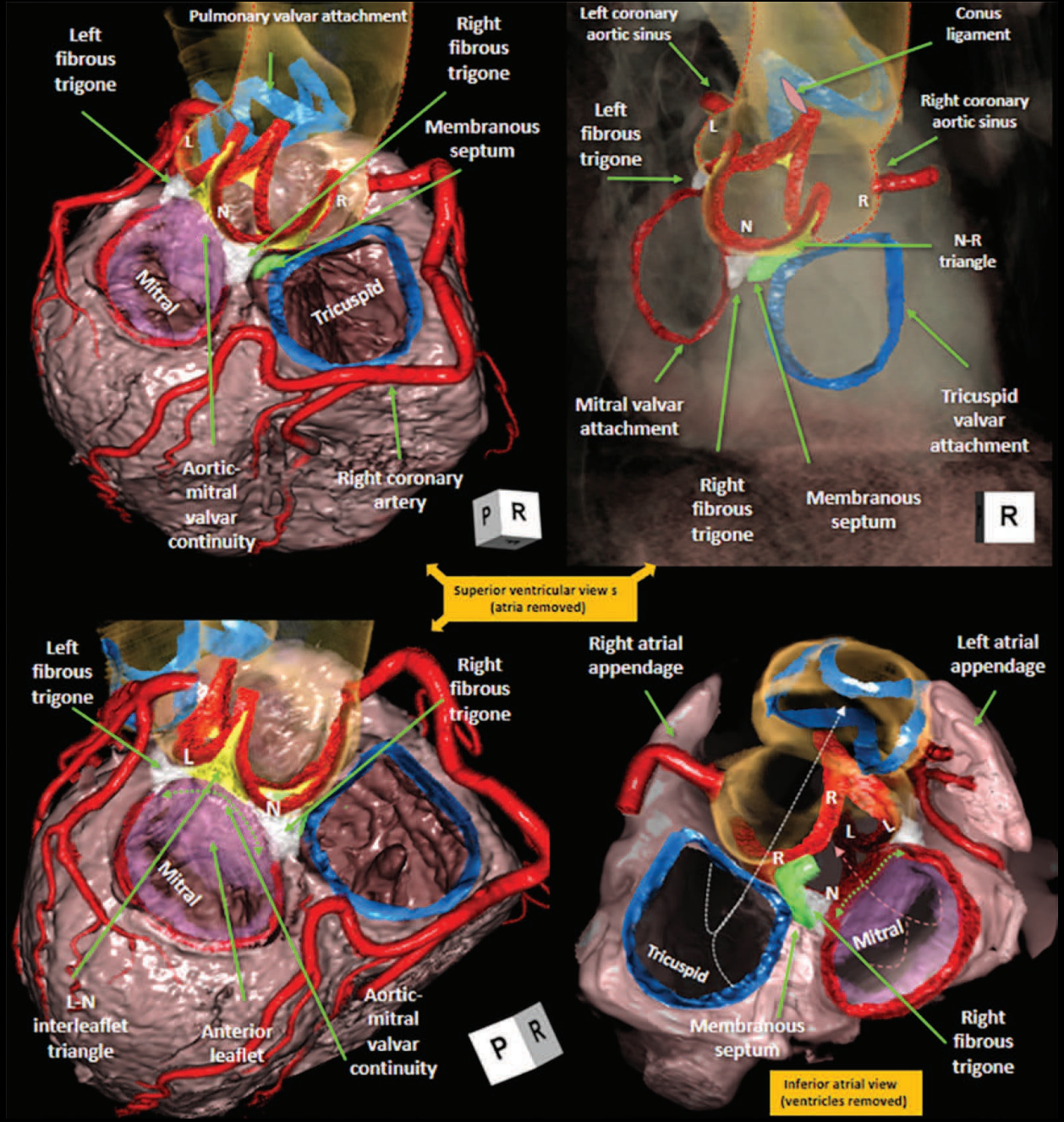
Saremi *et al.* (2017) *Radiographics* **37(5):** 1330-1351.



Standring (2021) *Gray's Anatomy, 42nd Edition*. Elsevier, UK.

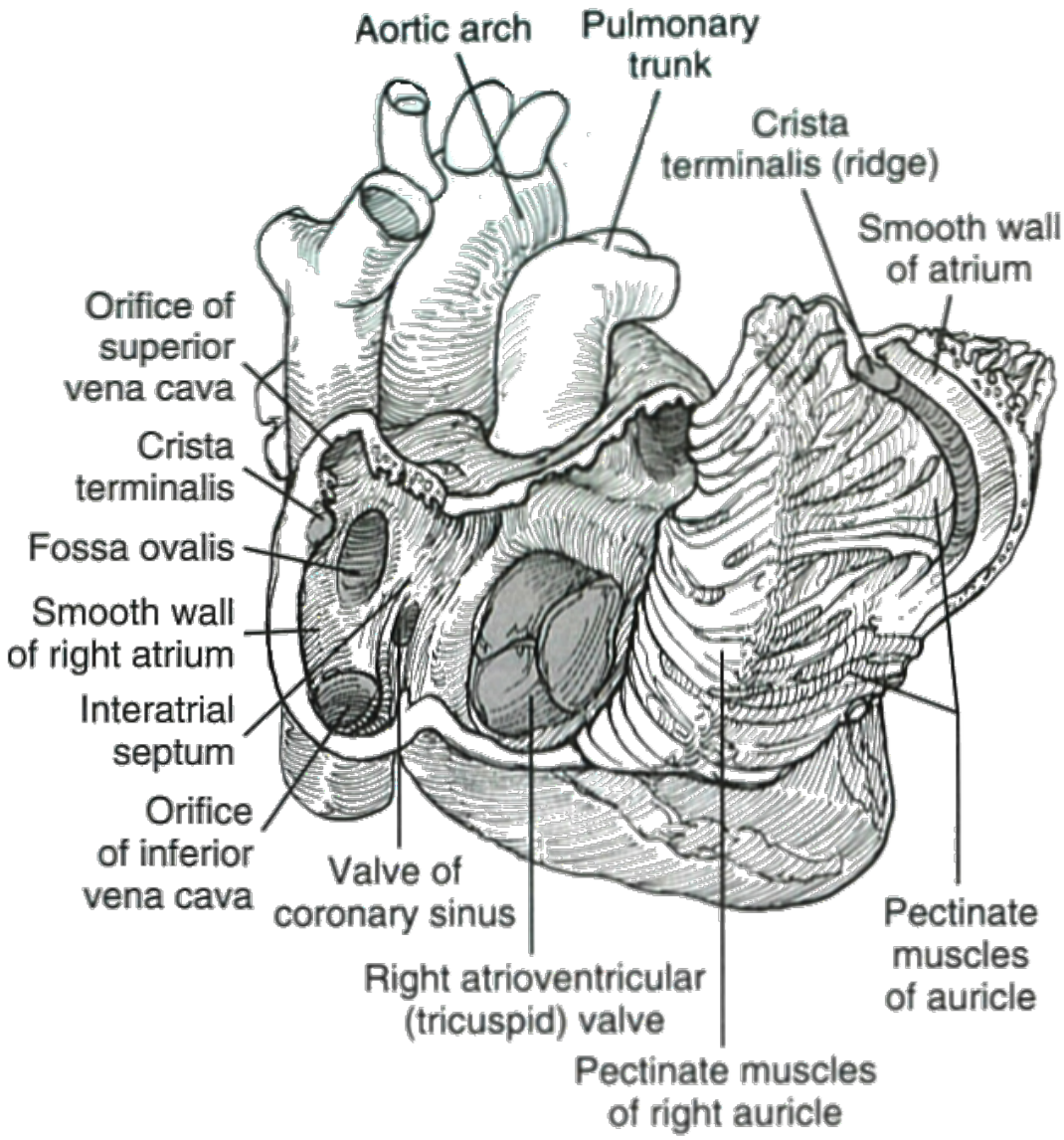


Buratto and Konstantinov (2021) *The Journal of Thoracic and Cardiothoracic Surgery* **162:** 360-365.

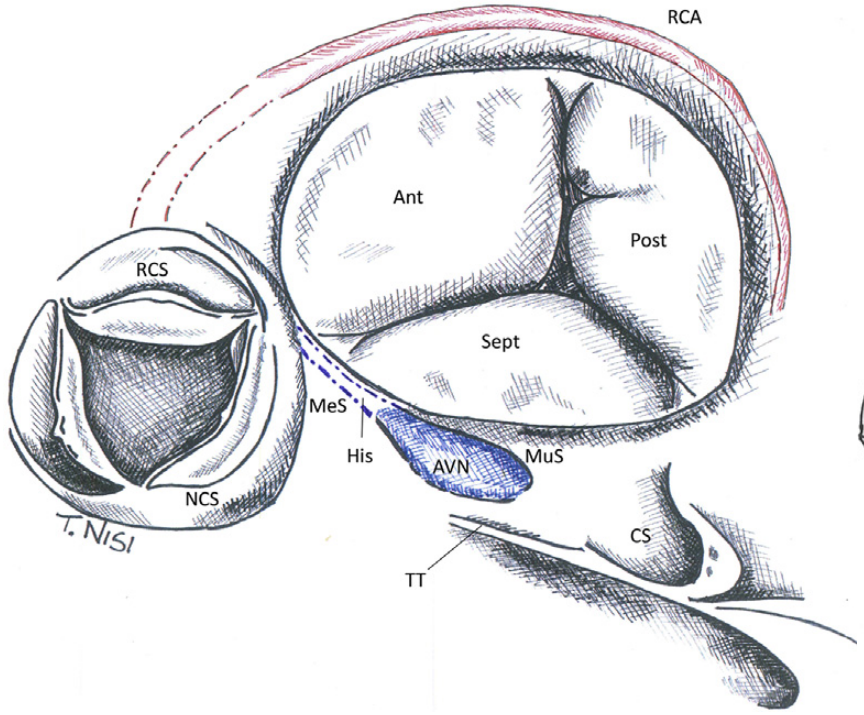


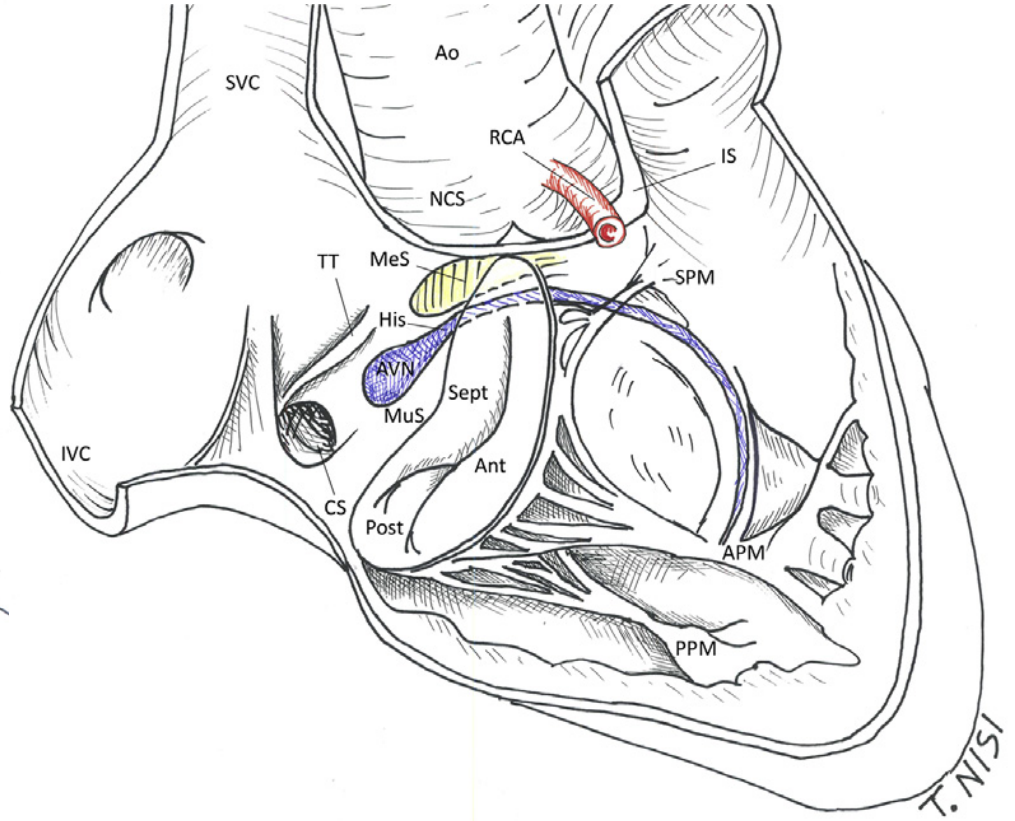
Saremi *et al.* (2017) *Radiographics* **37(5):** 1330-1351.

ANTEROLATERAL

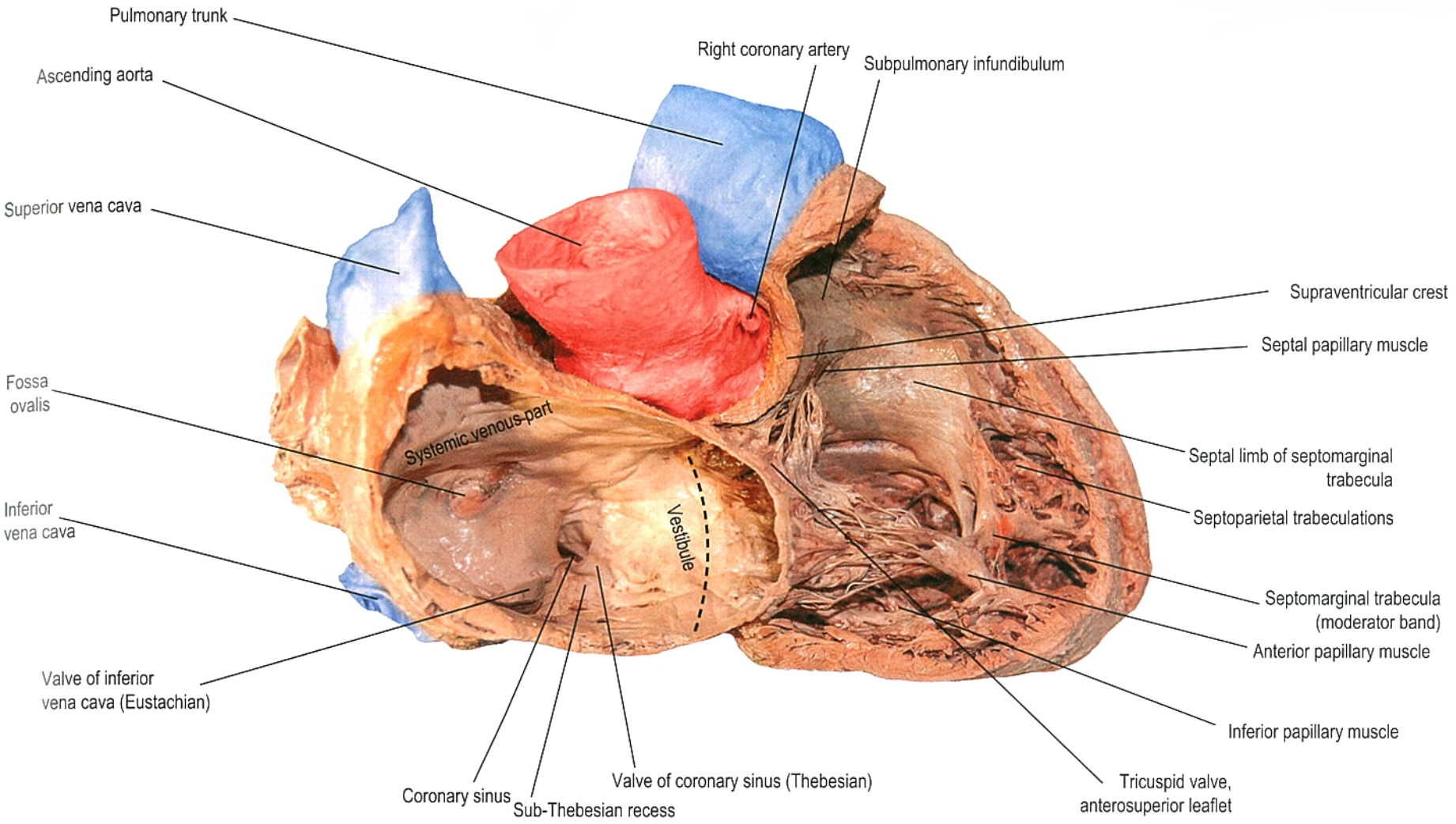


WJ Larsen (2002) *Anatomy: Development, Function, Clinical Correlations*. Saunders, USA.





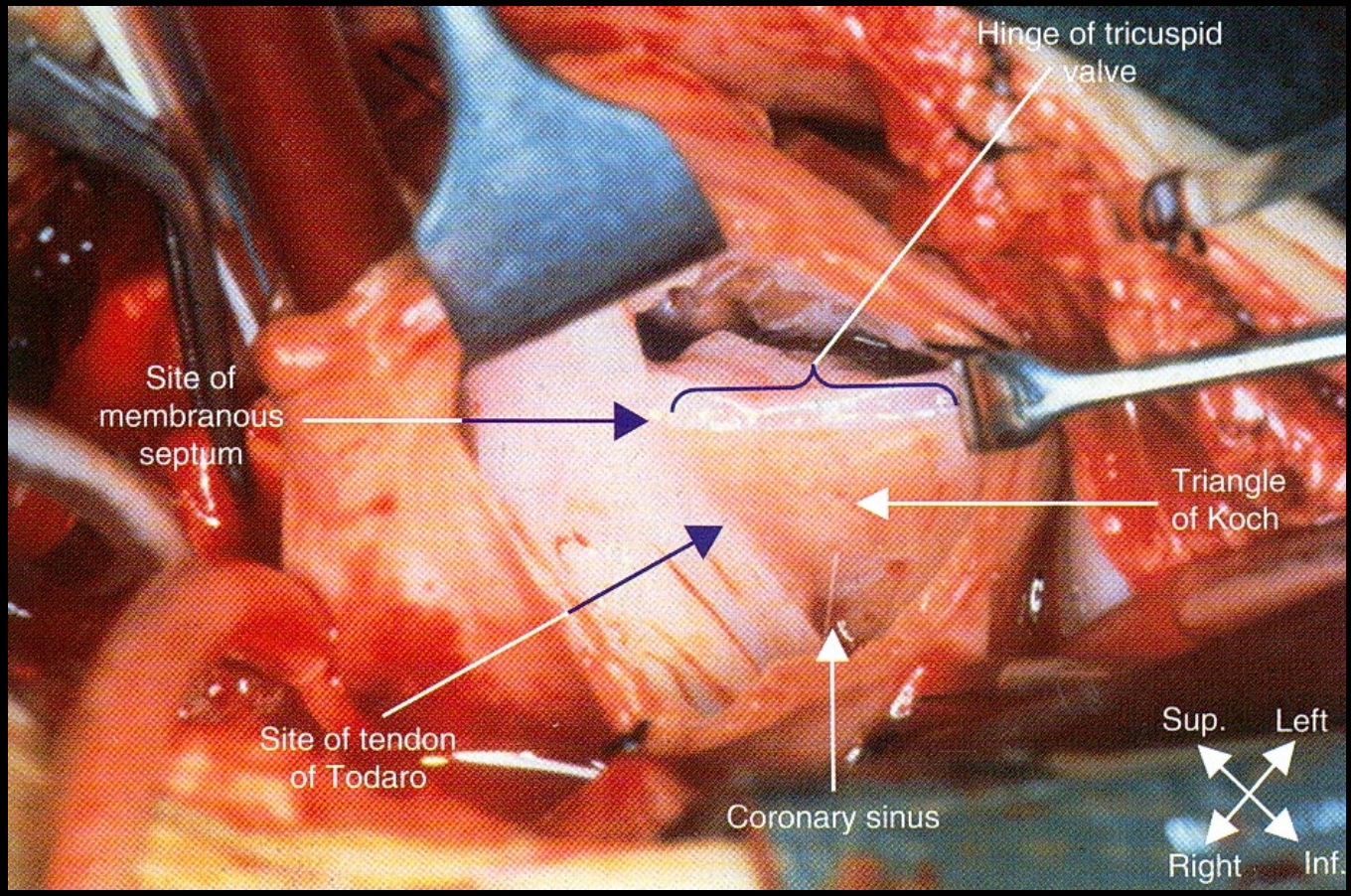
Buzzatti *et al.* (2018) *Interventional Cardiology Clinics* **7:** 1-11.



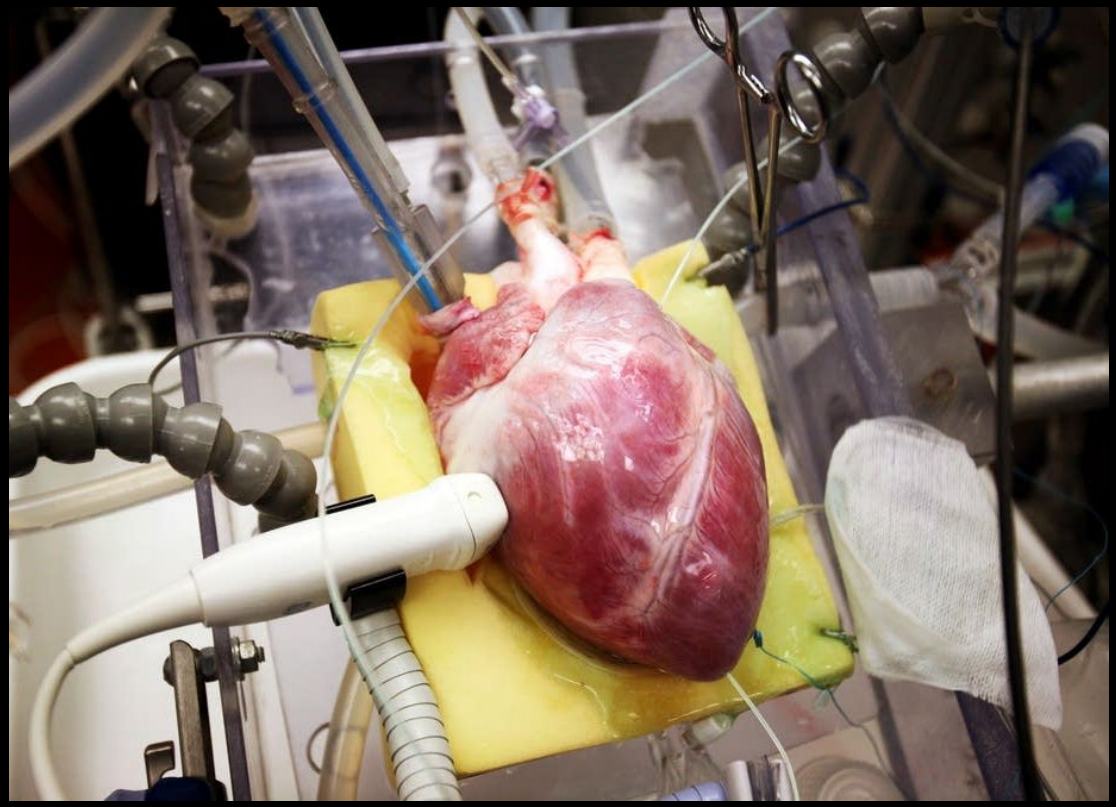
Standring (2021) *Gray's Anatomy, 42nd Edition*. Elsevier, UK.

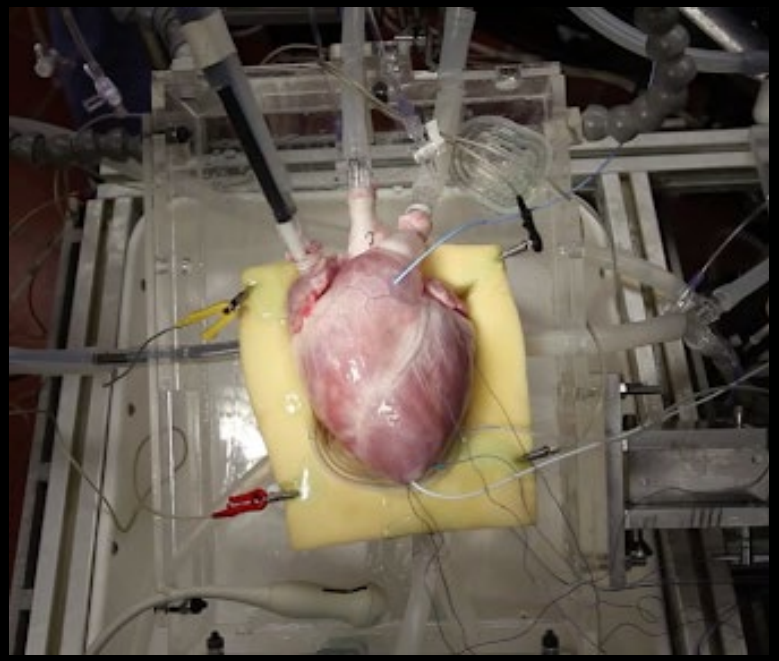
Triangle of Koch

- atrioventricular (AV) node at centre
- Bundle of His projects through its apex
- bounded by:
  - base of the septal leaflet of the tricuspid valve
  - tendon of Todaro/Eustachian Ridge
  - coronary sinus ostium

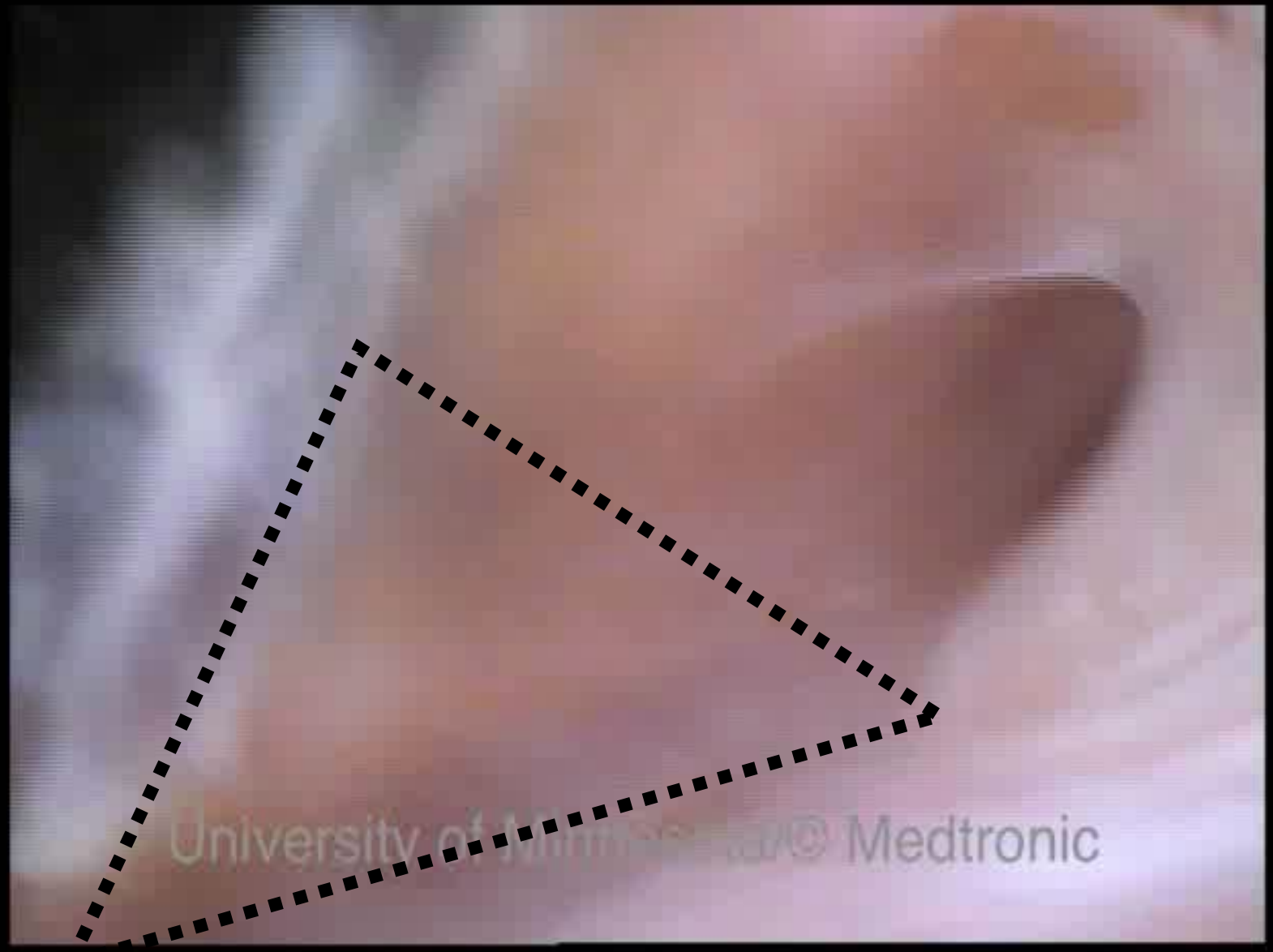


Anderson *et al.* (2013) *Wilcox's Surgical Anatomy of the Heart*. Cambridge University Press, UK.

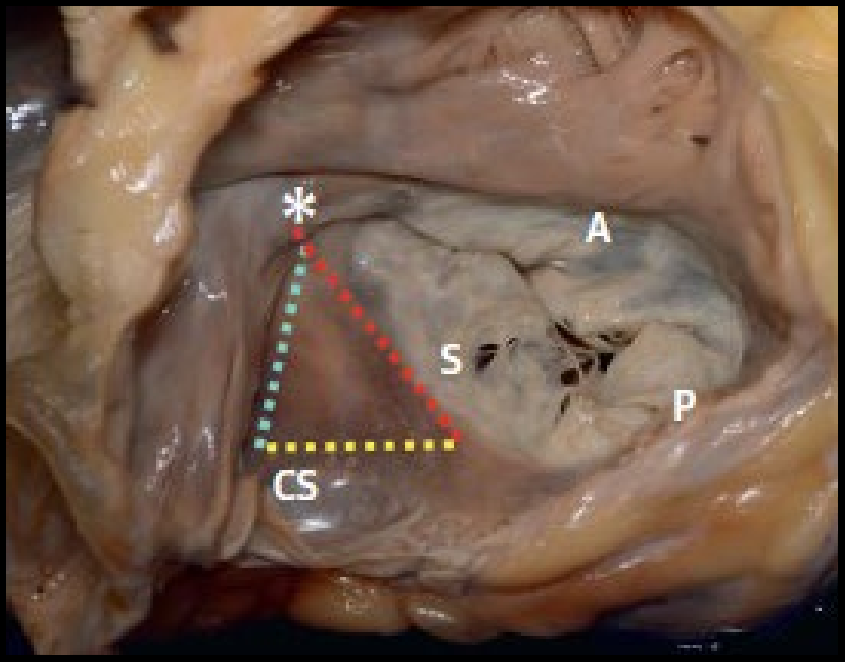


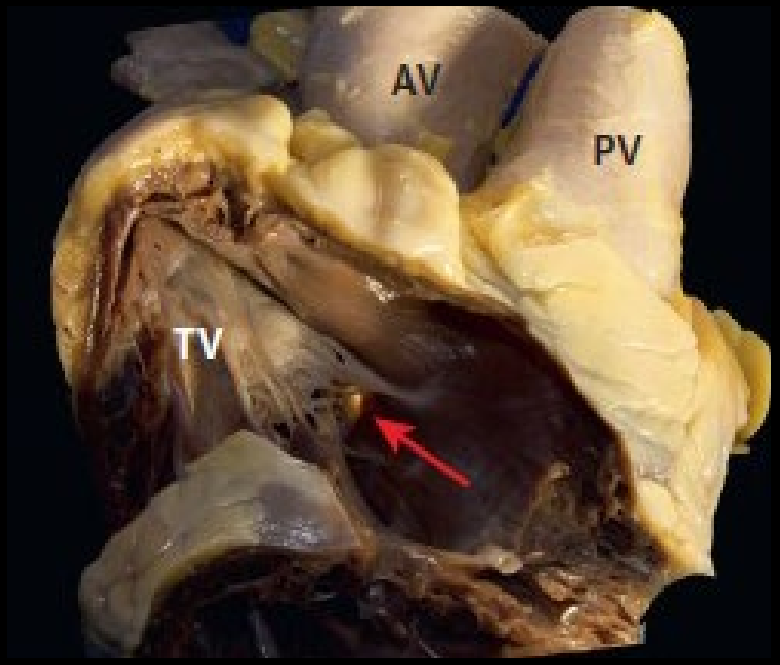


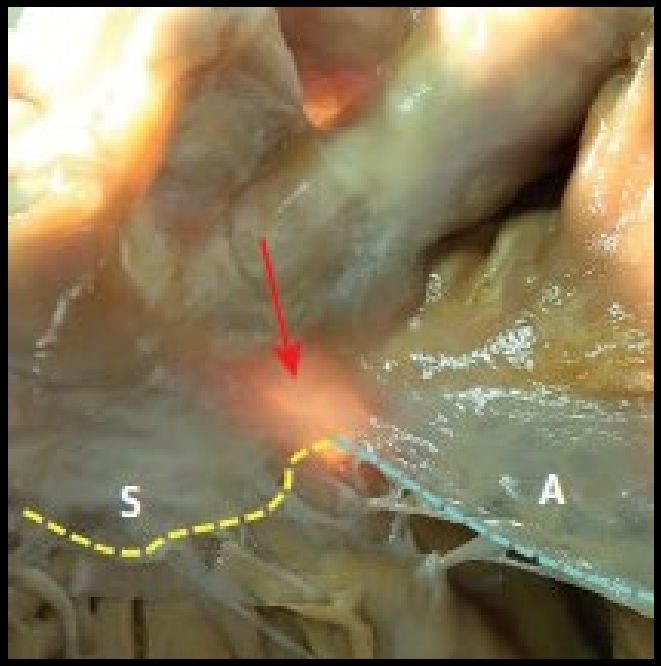
Paul Iaizzo, University of Minnesota Visible Heart Laboratory



Paul Iaizzo, University of Minnesota Visible Heart Laboratory

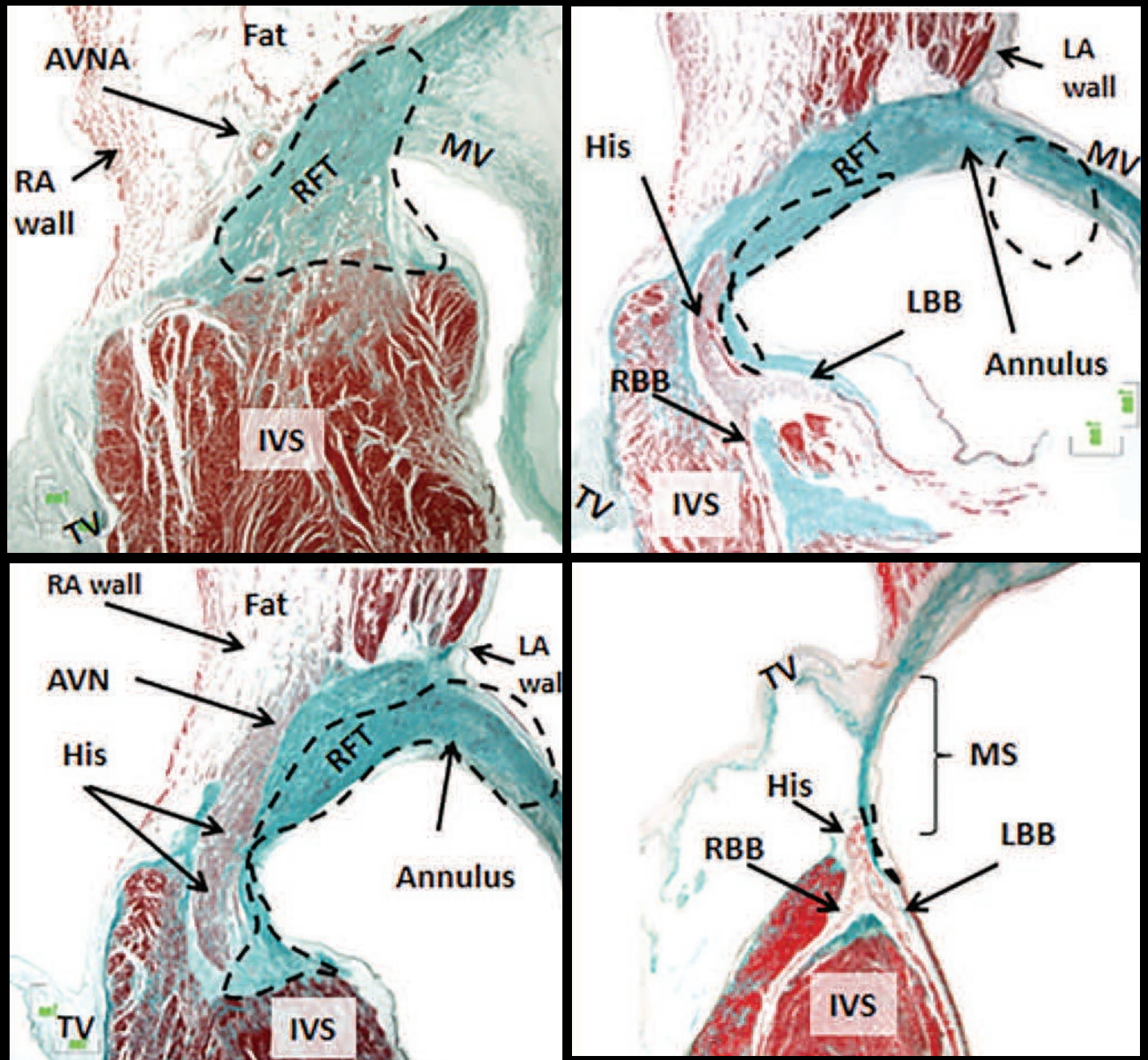




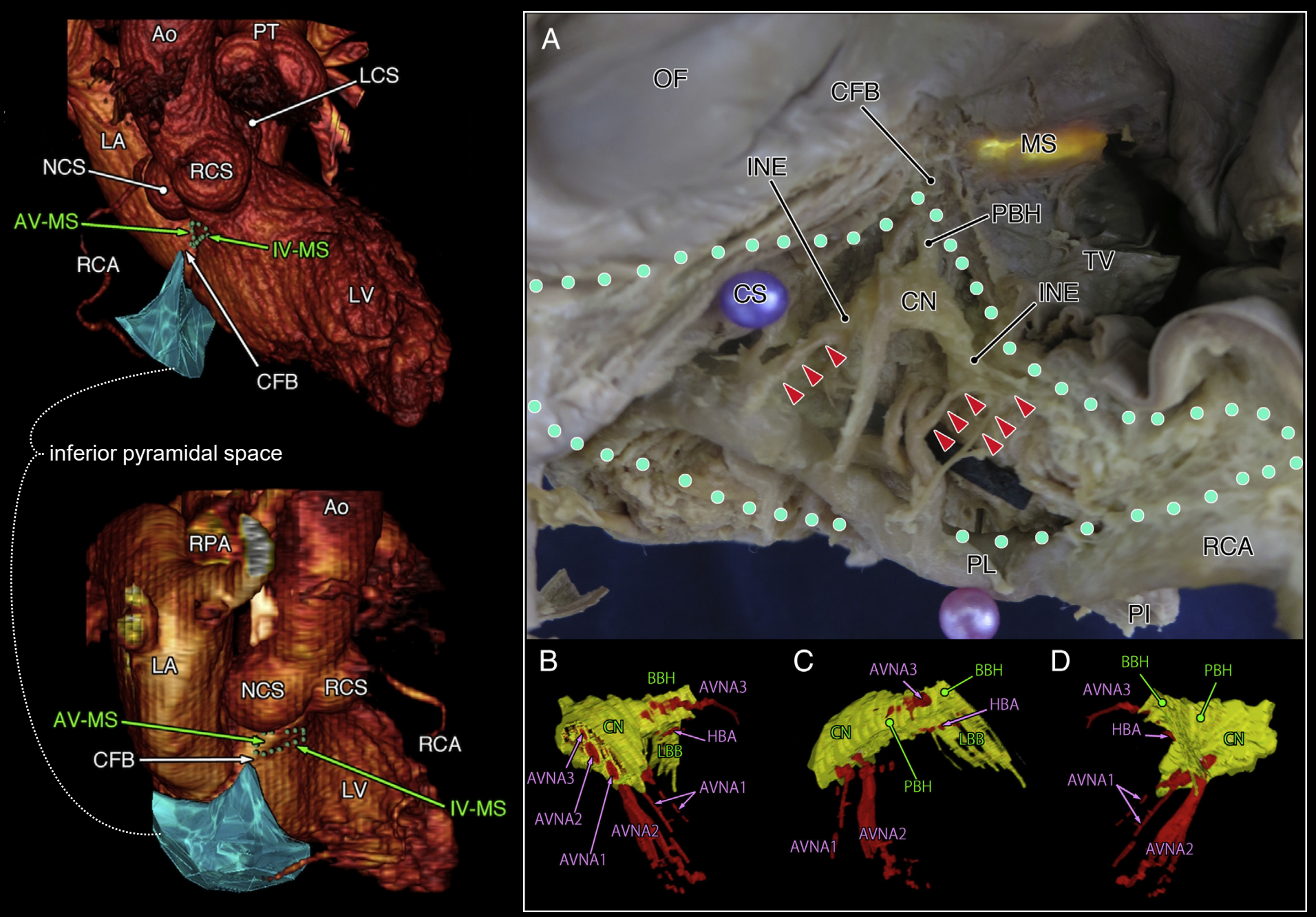


Cardiovascular Research Foundation®

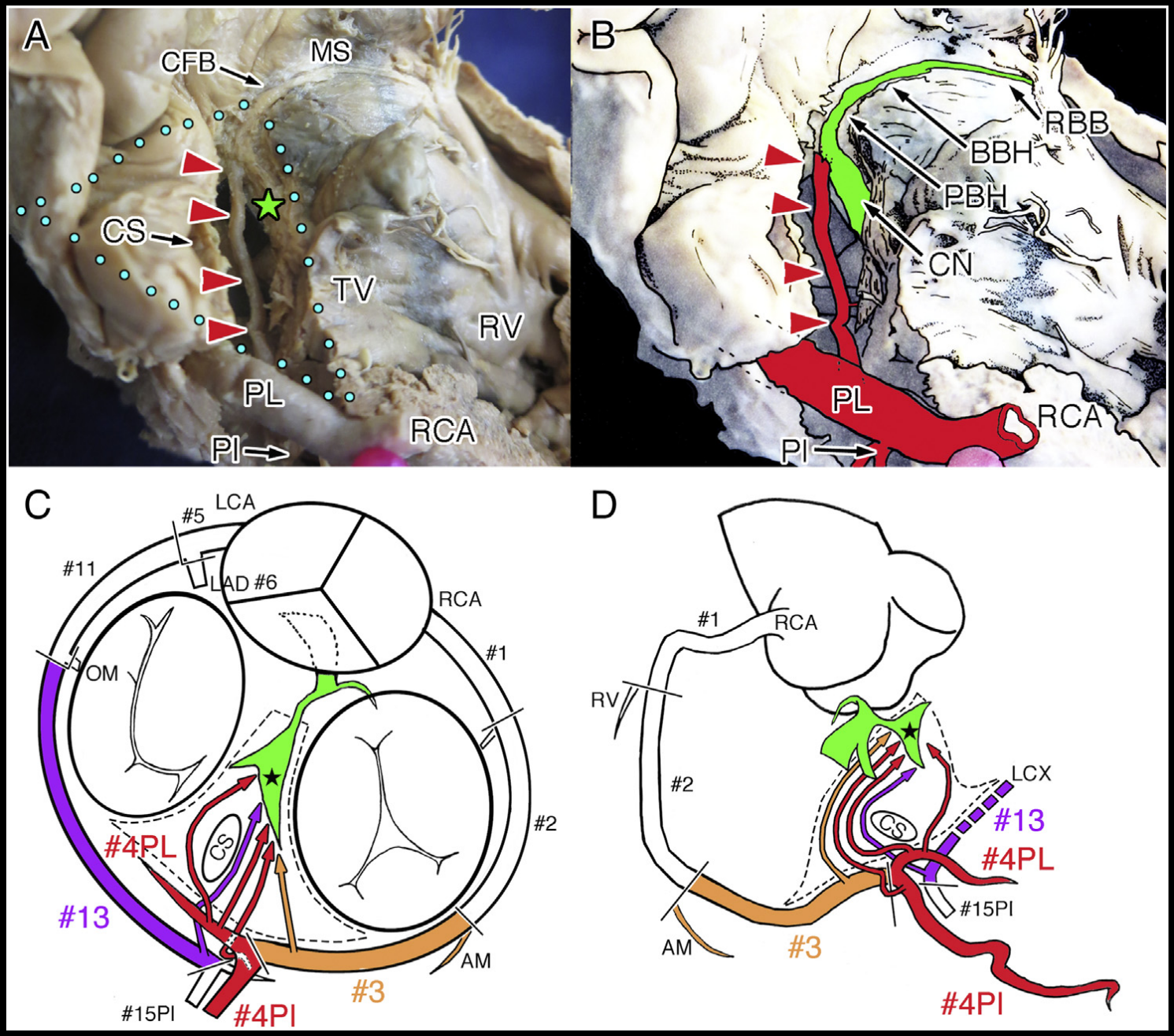
Dahou *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 458-468.



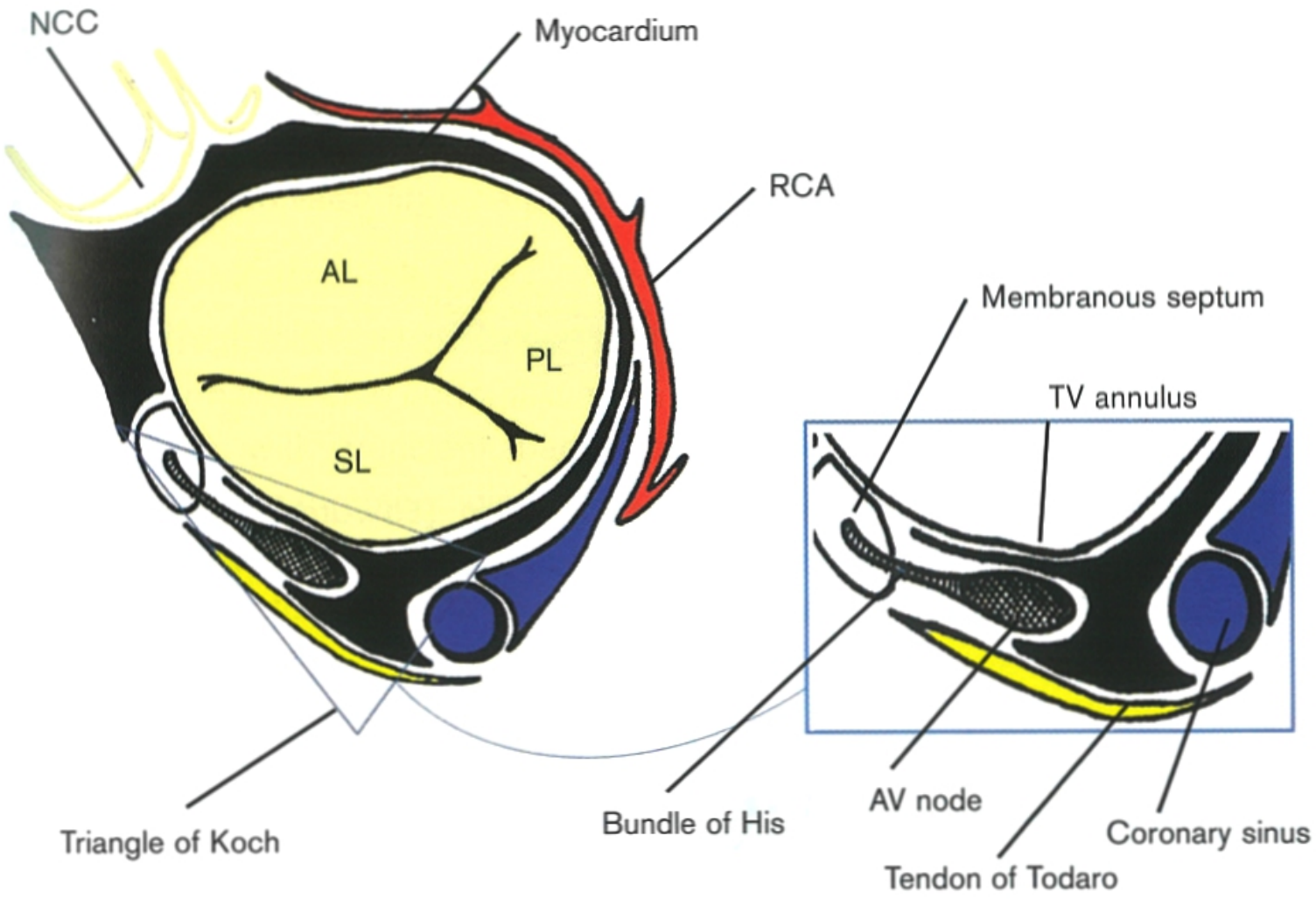
Saremi *et al.* (2017) *Radiographics* **37(5):** 1330-1351.



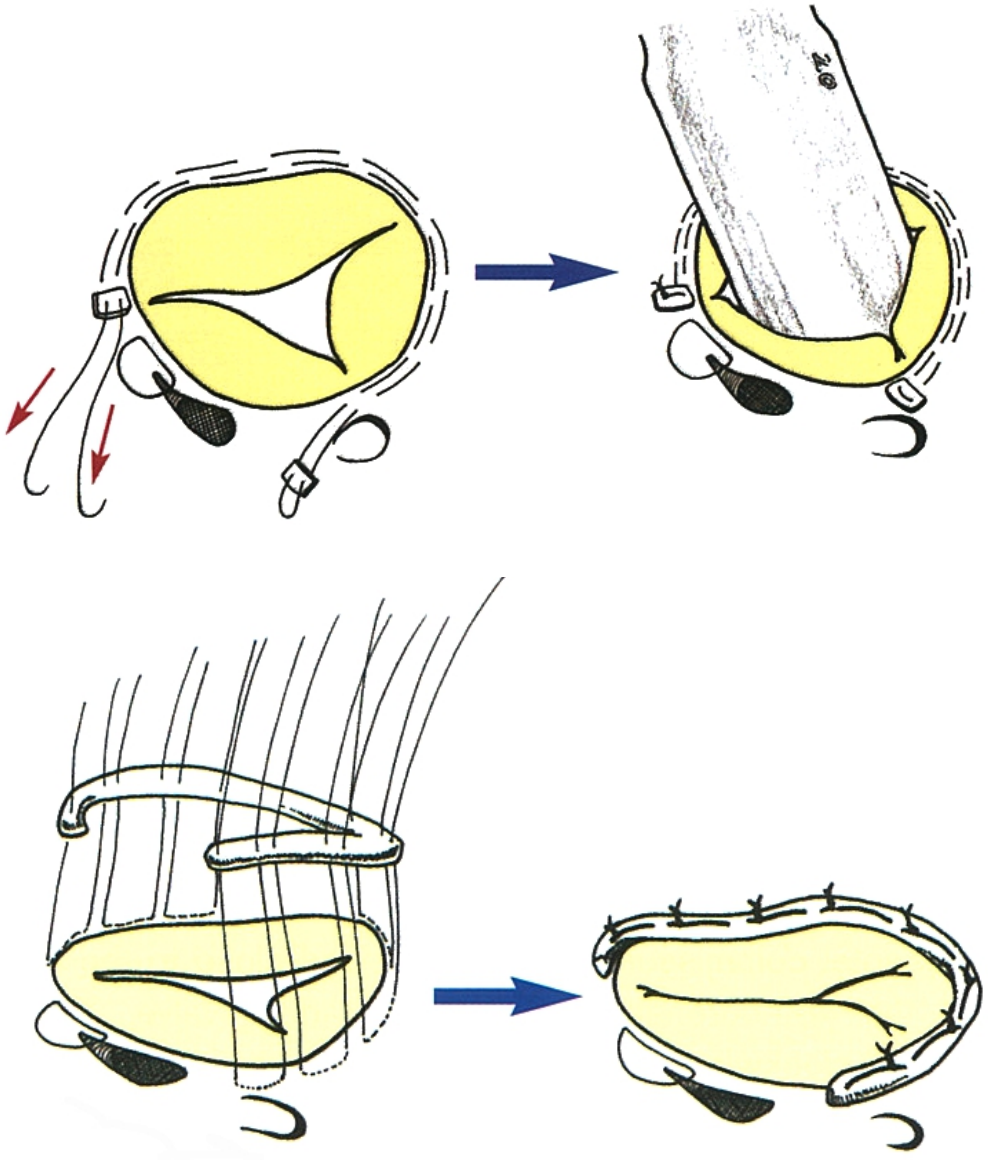
Kawashima and Sato (2018) *International Journal of Cardiology* **269:** 158-164.

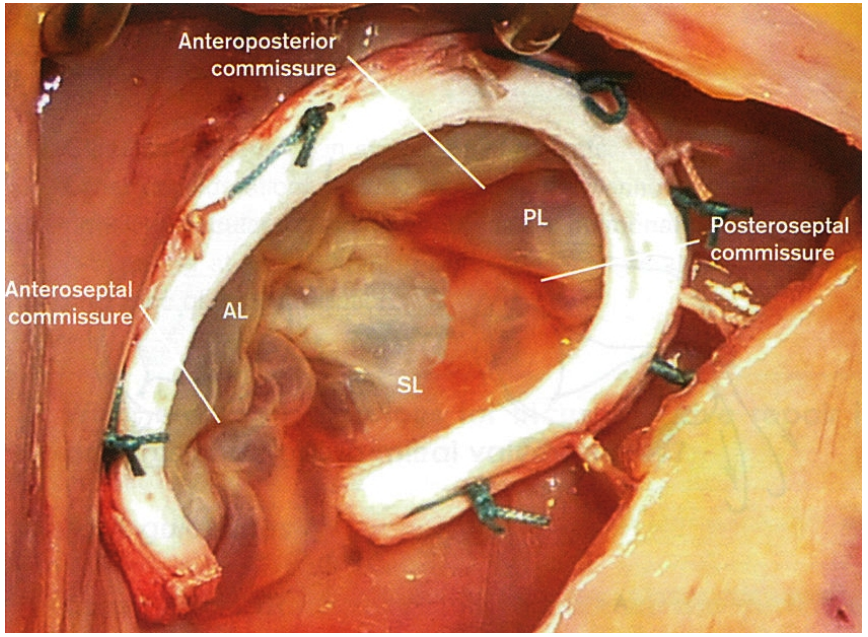


Kawashima and Sato (2018) *International Journal of Cardiology* **269:** 158-164.



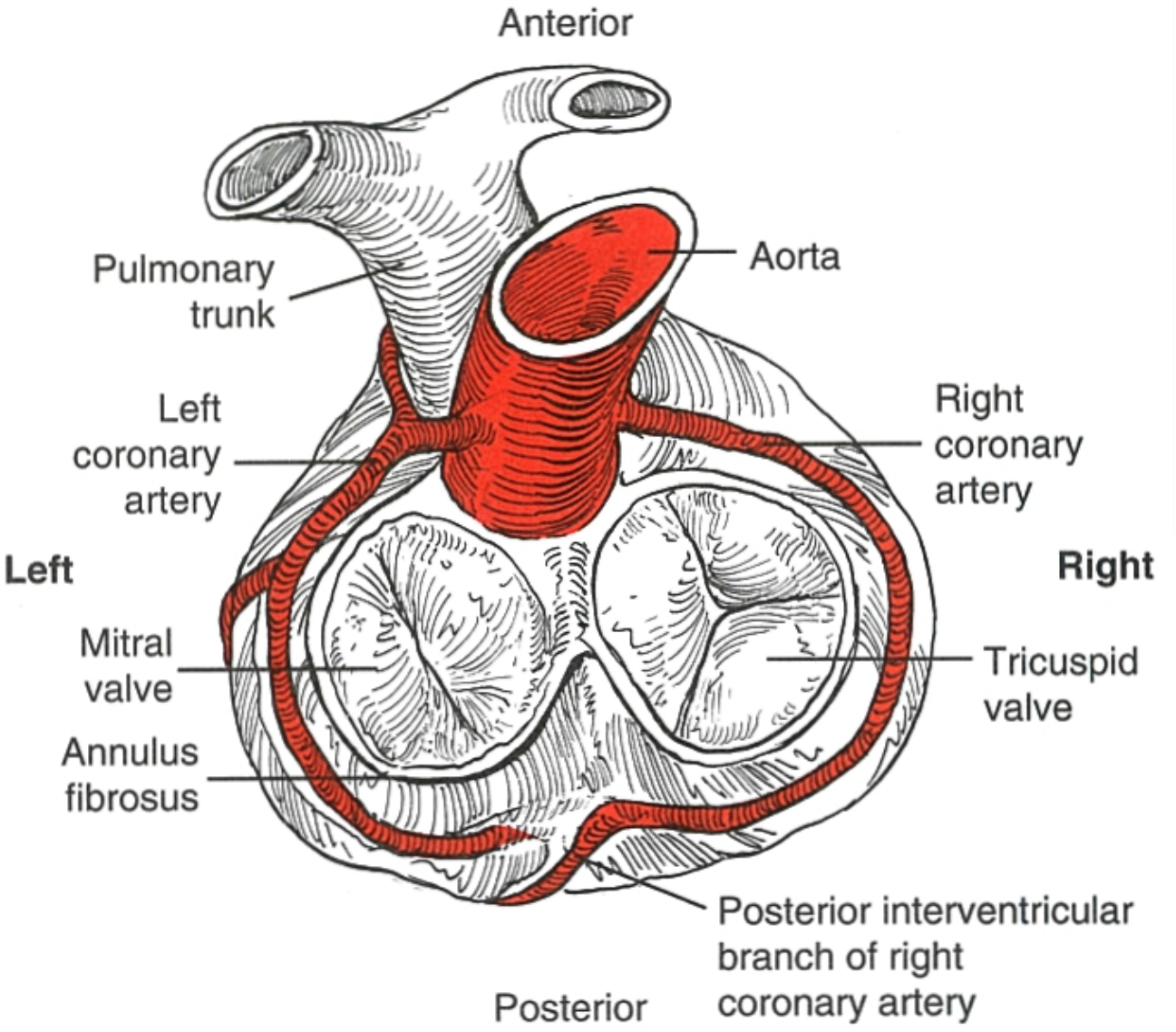
Moorjani *et al.*(2011) *Key Questions in Cardiac Surgery*. tfm Publishing, UK.



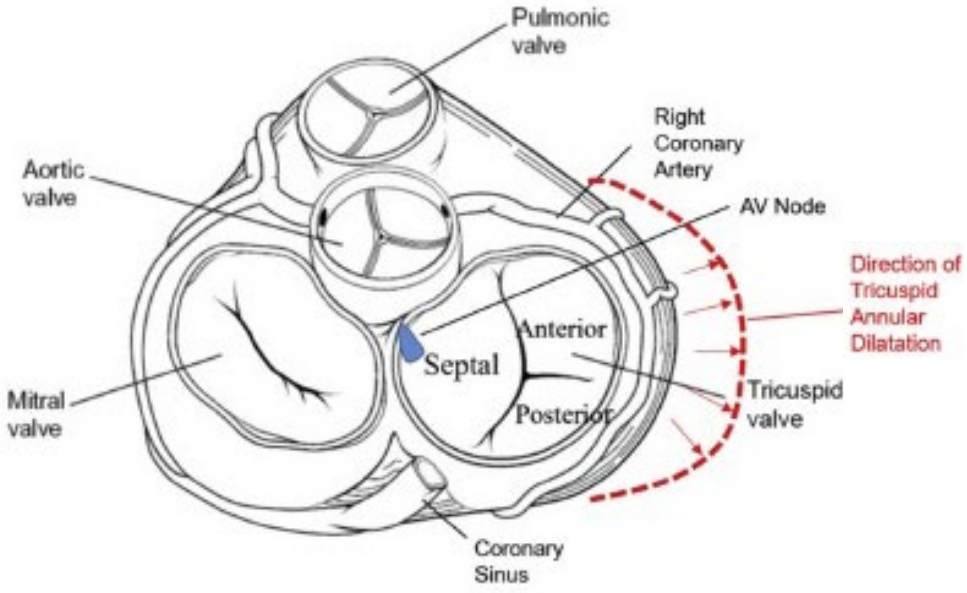


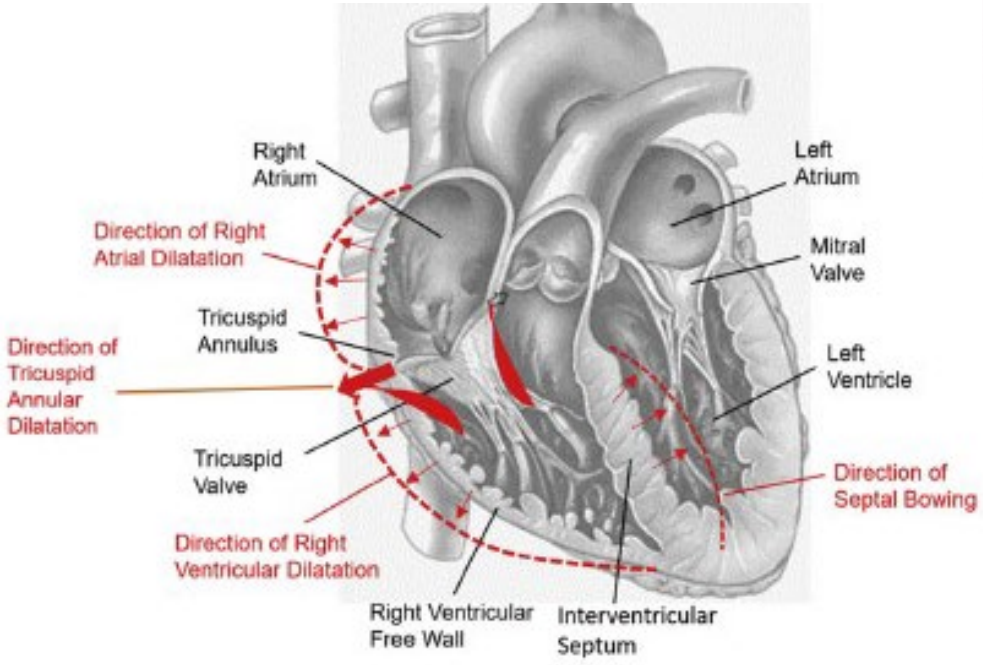
Moorjani *et al.*(2011) *Key Questions in Cardiac Surgery*. tfm Publishing, UK.

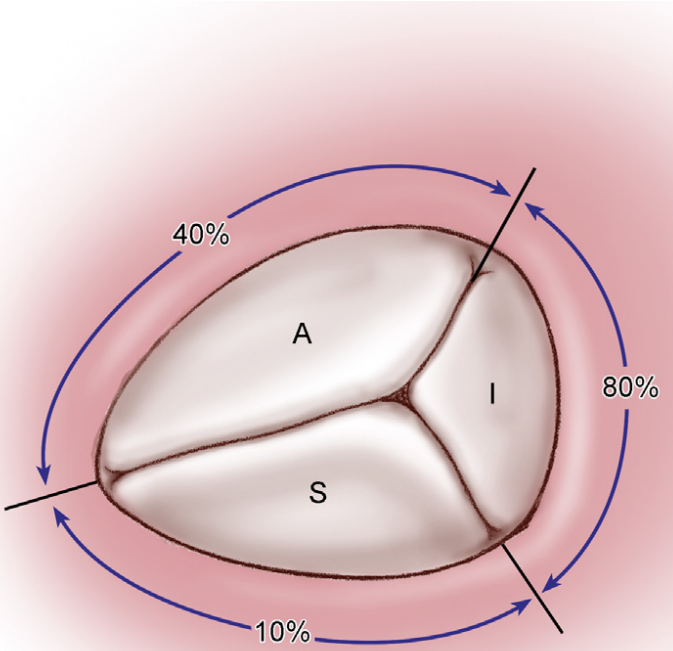
SUPERIOR



WJ Larsen (2002) *Anatomy: Development, Function, Clinical Correlations*. Saunders, USA.

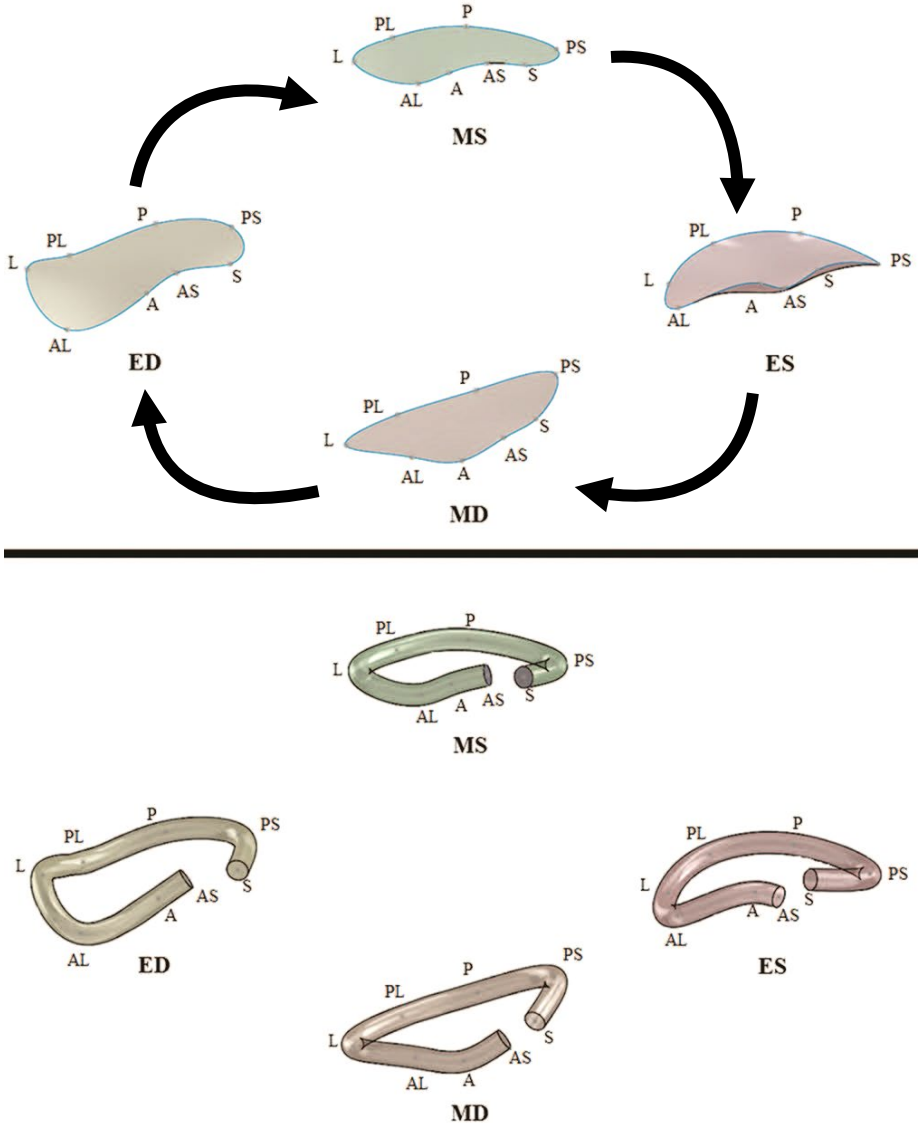






Dahou *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 458-468.

Saran and Dearani (2018) *Annals of Thoracic Surgery* **105:** 675-679.

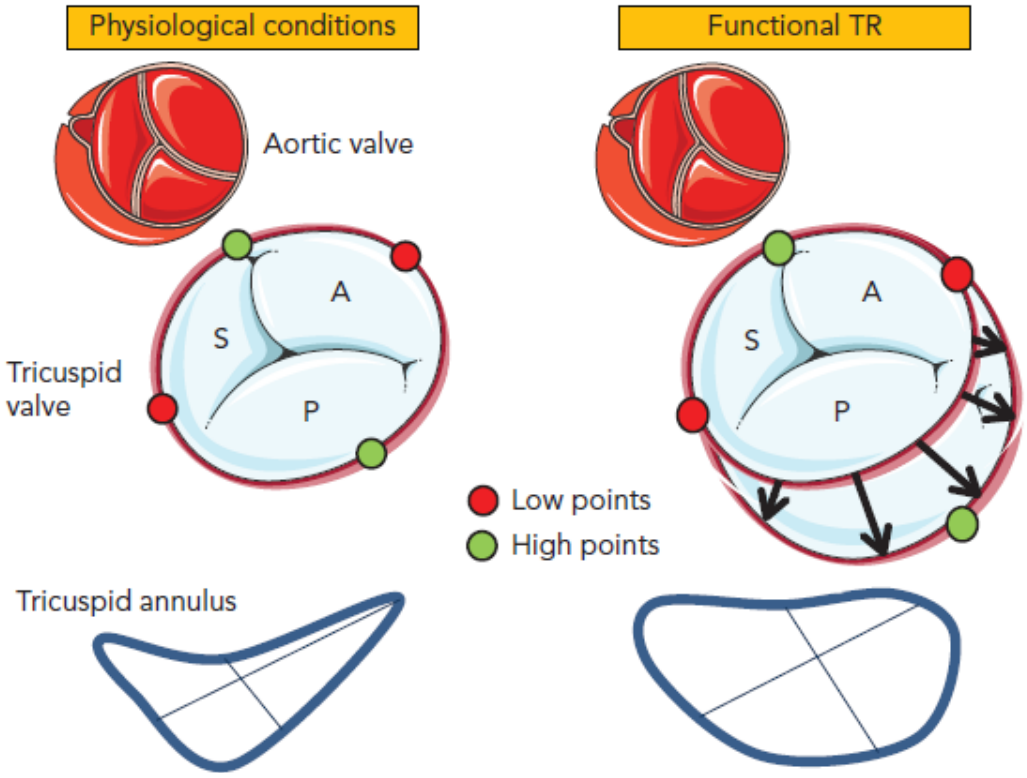


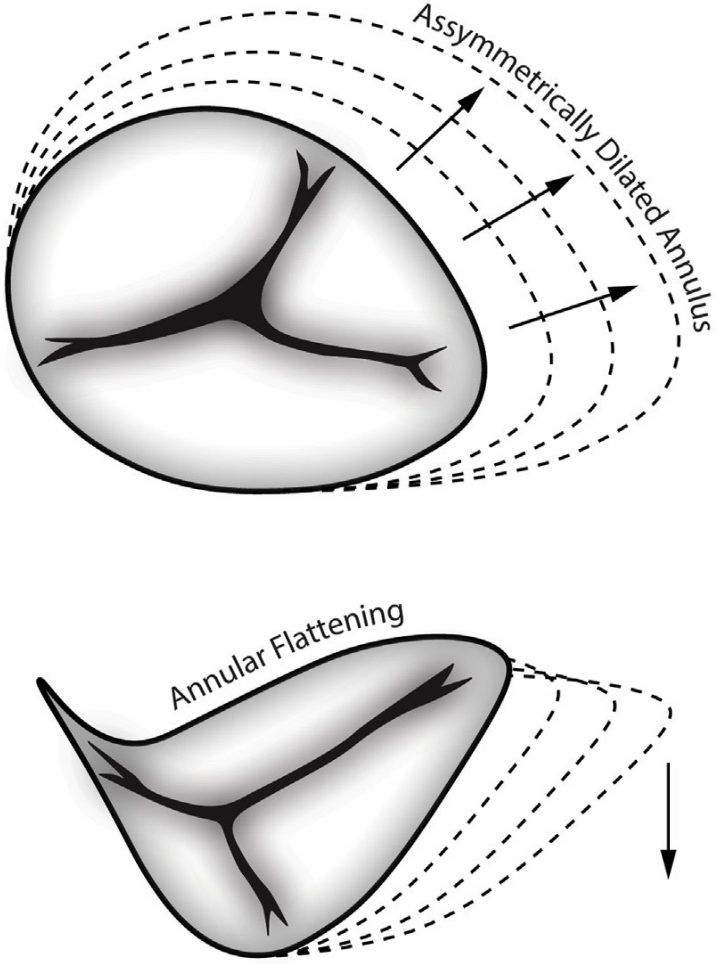
end-diastole

end-systole

Knio *et al.* (2016) *Annals of Cardiac Anaesthesia* **19:** 599-605.

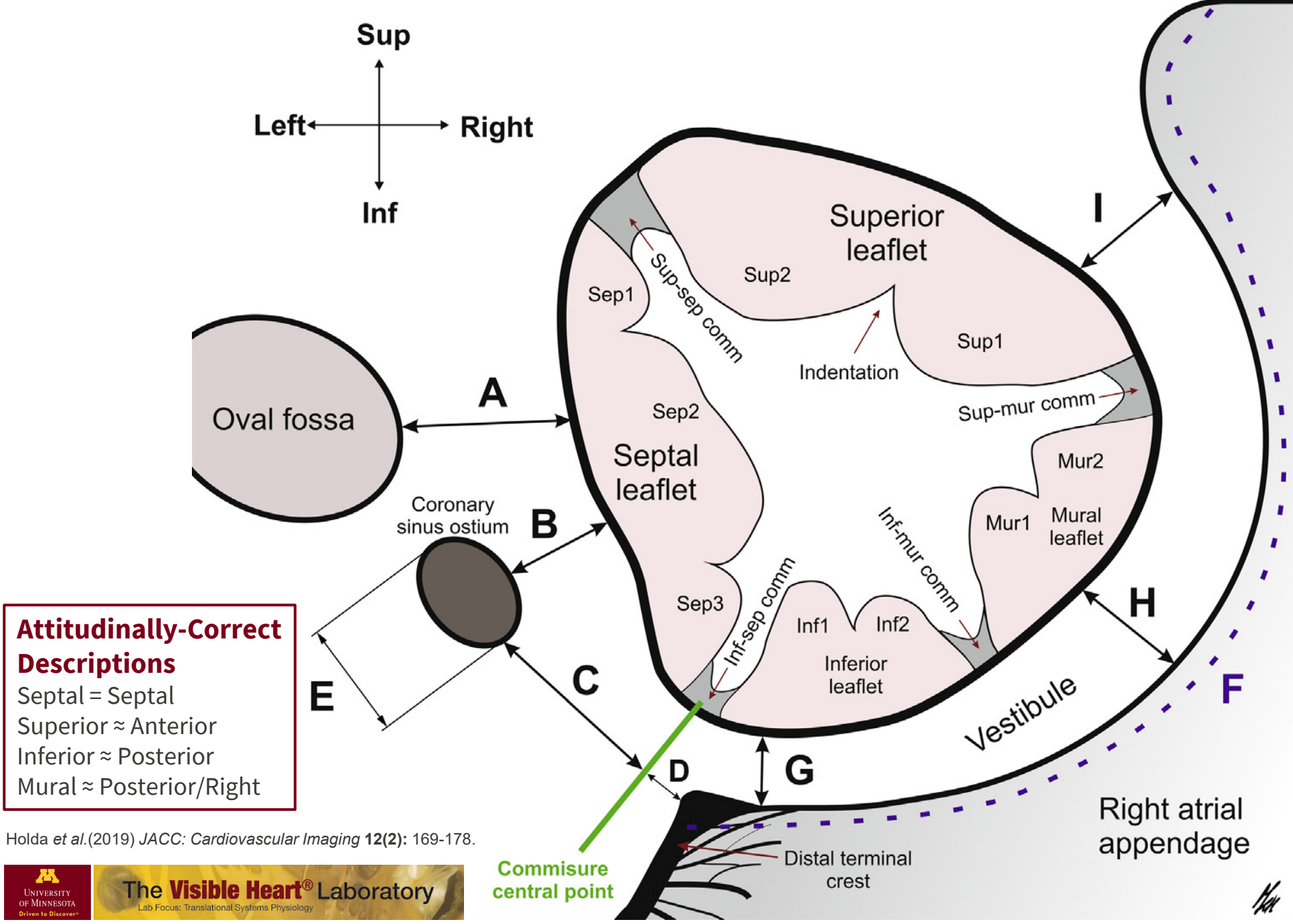
Owais *et al.* (2014) *Annals of Thoracic Surgery* **98(5):** 1536-1542.





Besler *et al.* (2018) *Interventional Cardiology* **13(1):** 8-13.

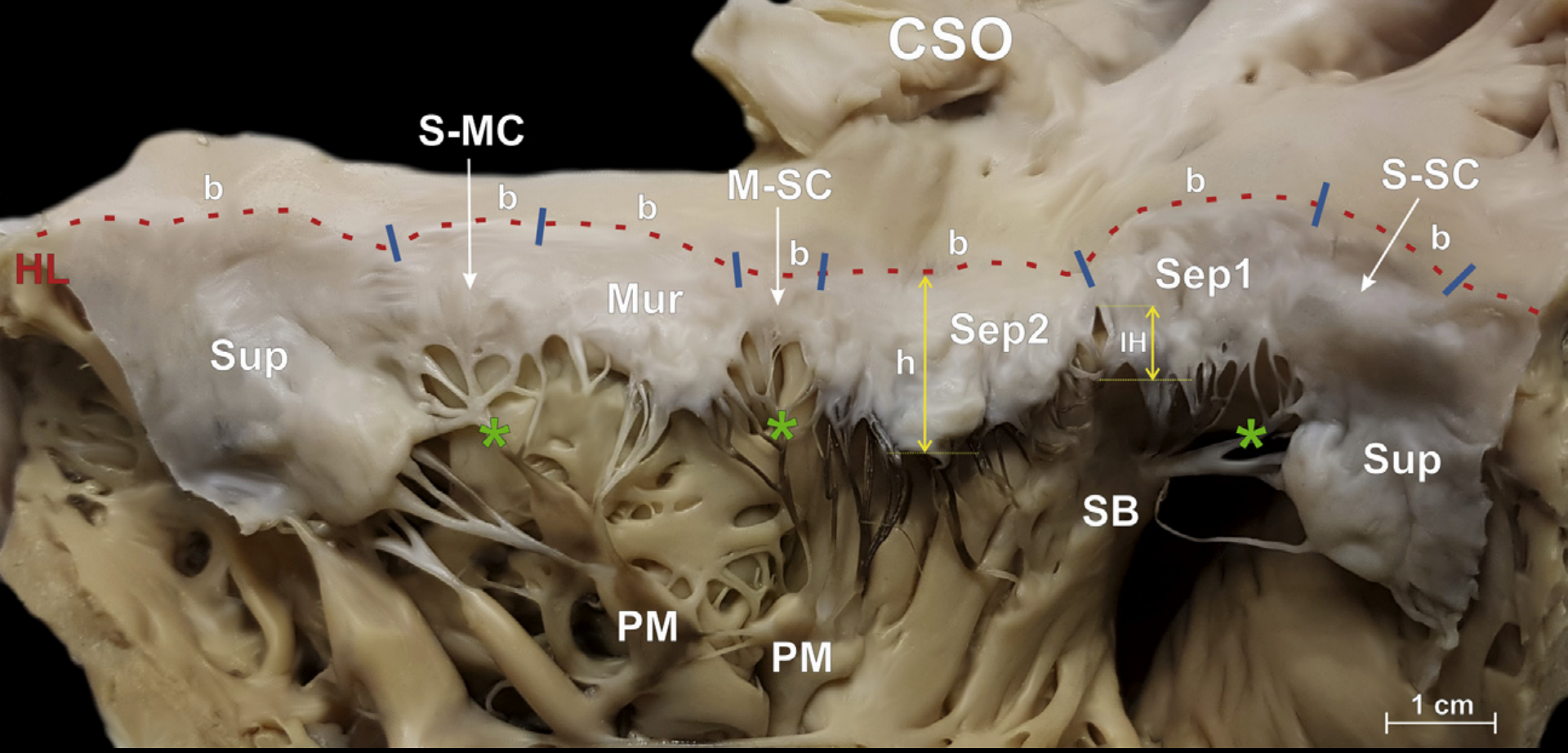
Mathur *et al.* (2018) *Annals of Thoracic Surgery* **110:** 1605-1614.

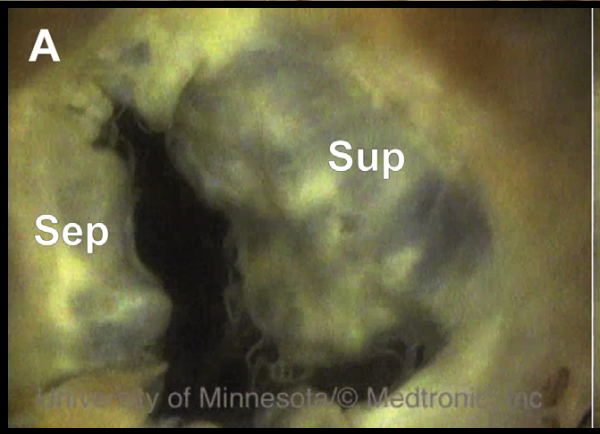


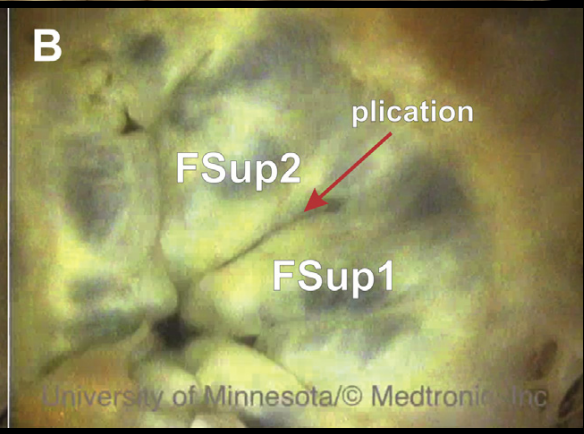
Attitudinally-Correct Descriptions

Septal = Septal
Superior ≈ Anterior
Inferior ≈ Posterior
Mural ≈ Posterior/Right

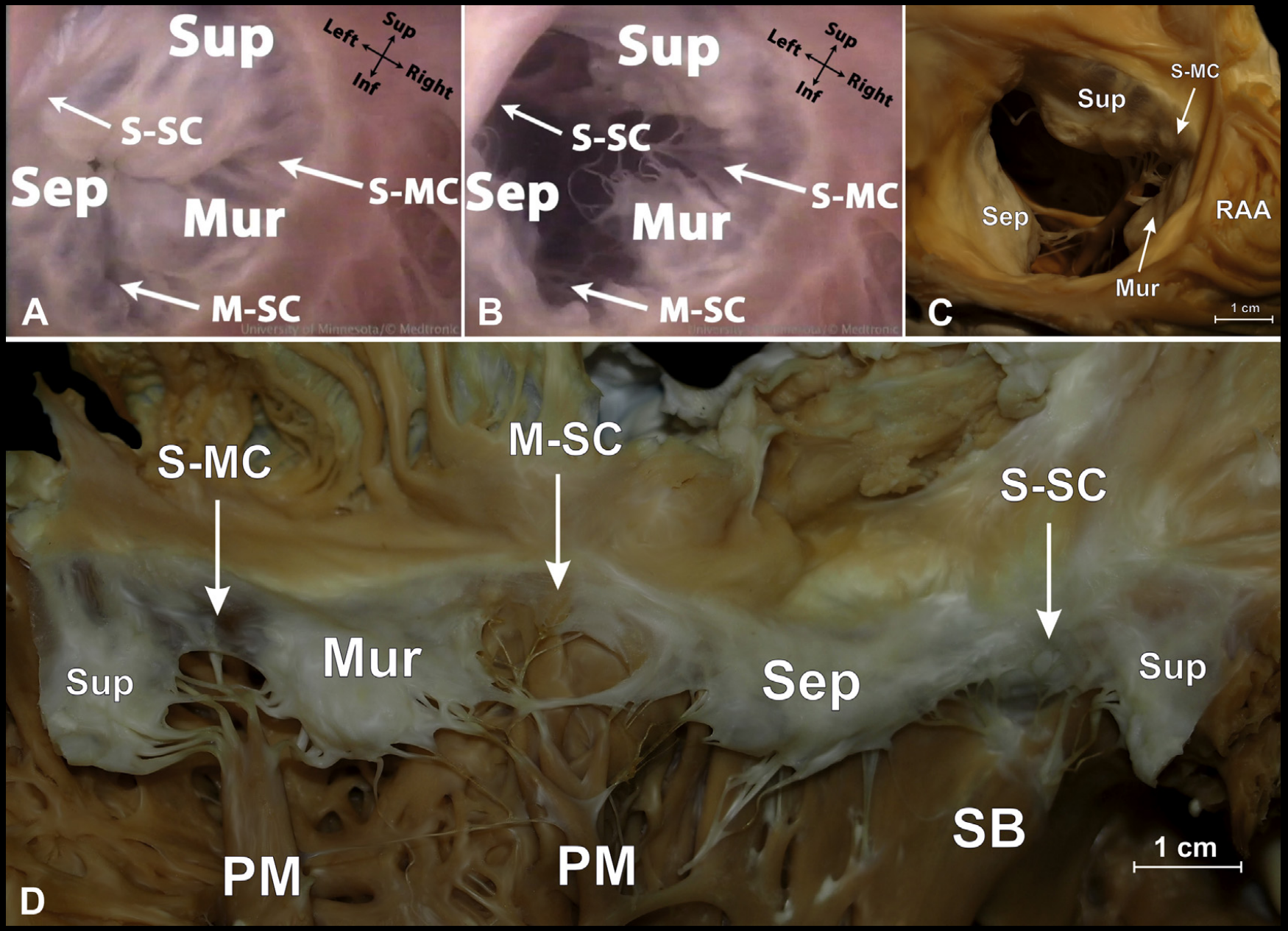
Holda *et al.*(2019) *JACC: Cardiovascular Imaging* **12(2):** 169-178.



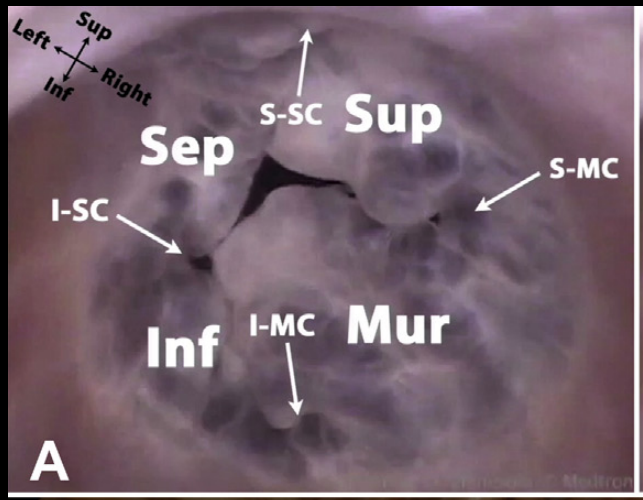


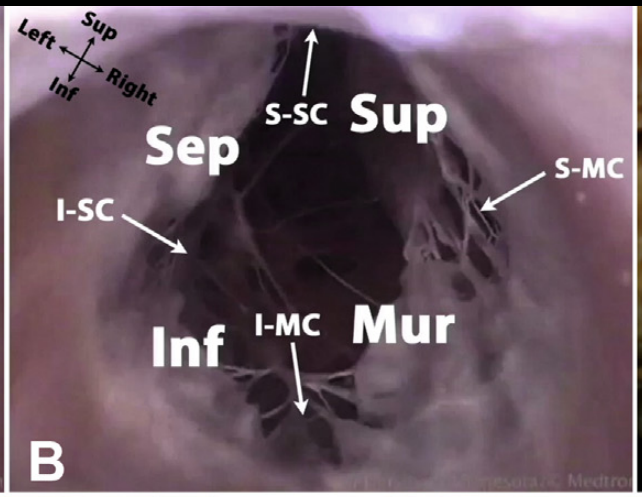


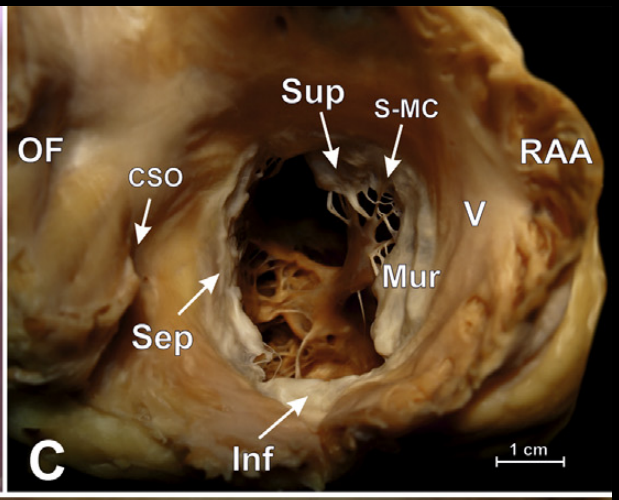
Holda *et al.*(2019) *JACC: Cardiovascular Imaging* **12(2):** 169-178.

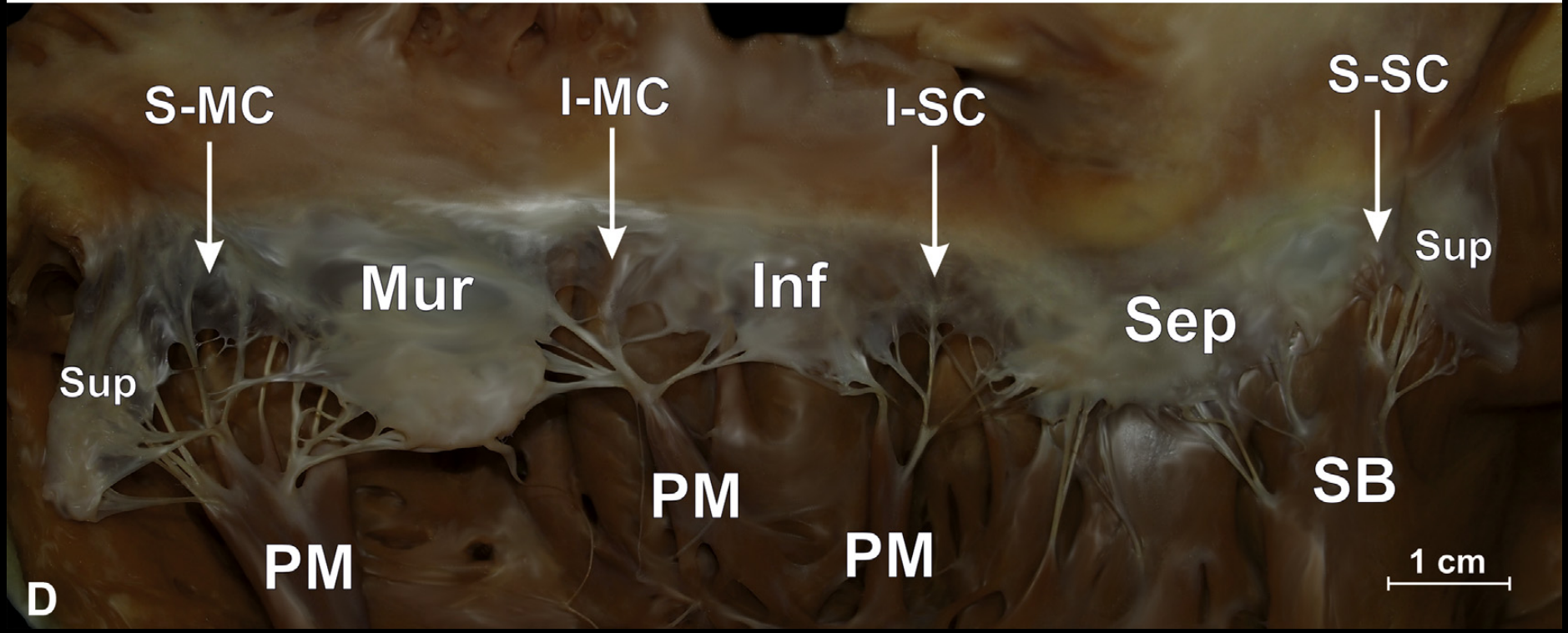


Holda *et al.*(2019) *JACC: Cardiovascular Imaging* **12(2):** 169-178.



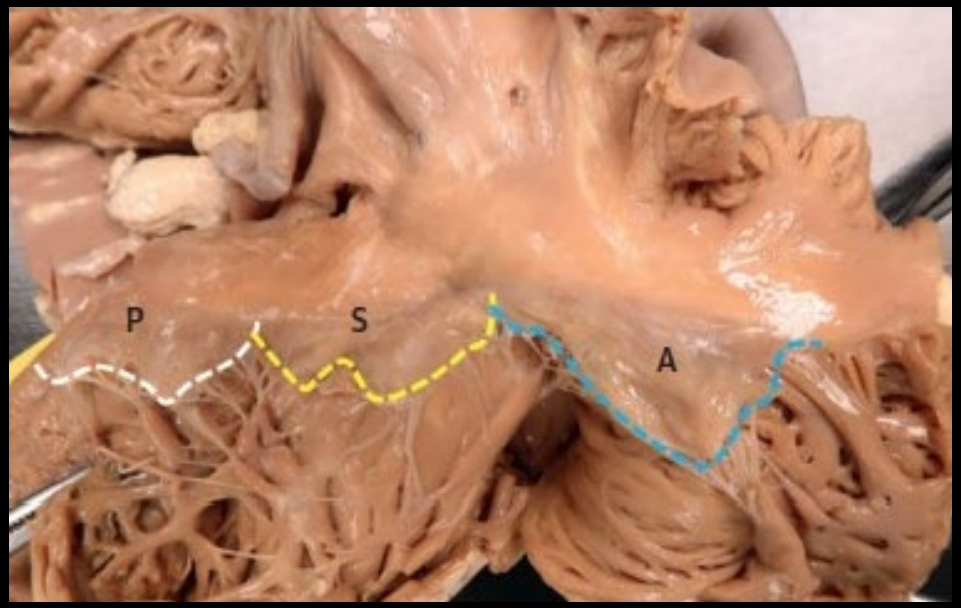


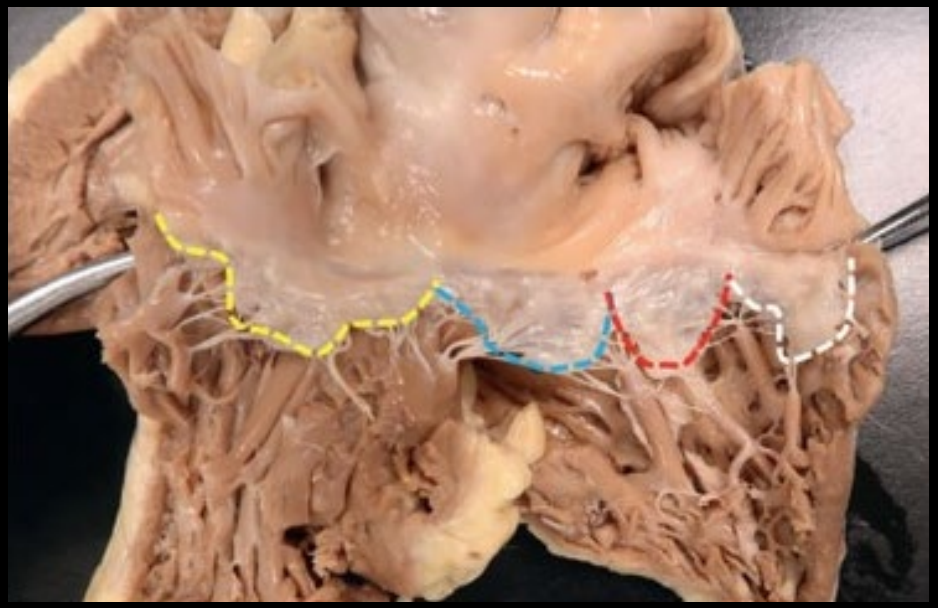


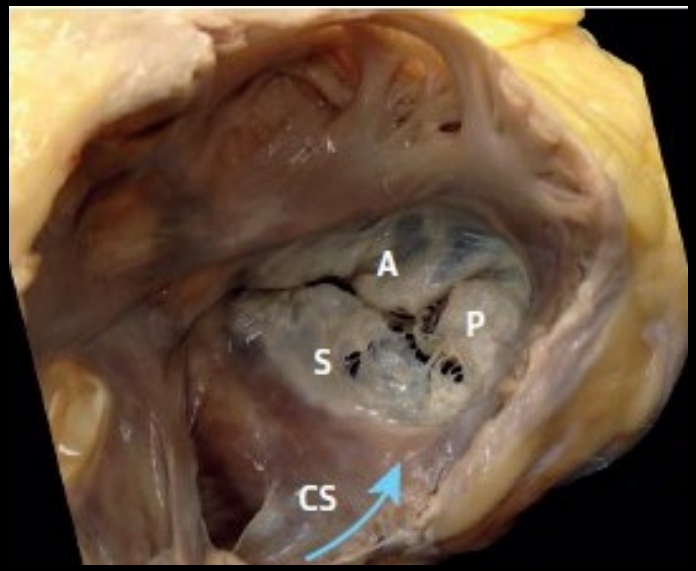


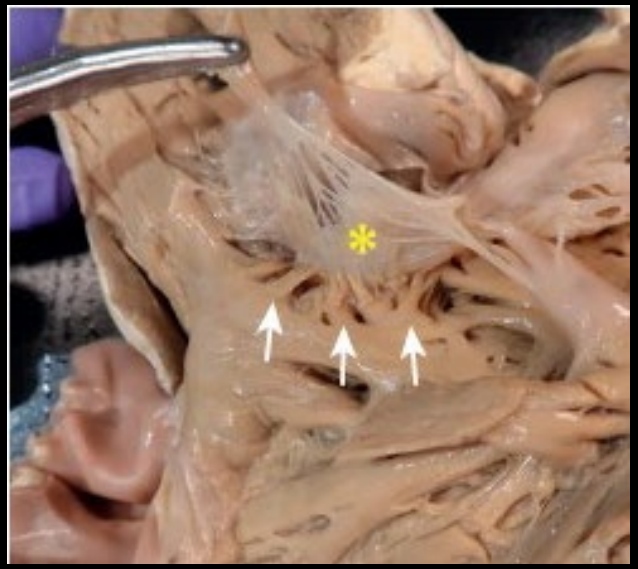
Holda *et al.*(2019) *JACC: Cardiovascular Imaging* **12(2):** 169-178.

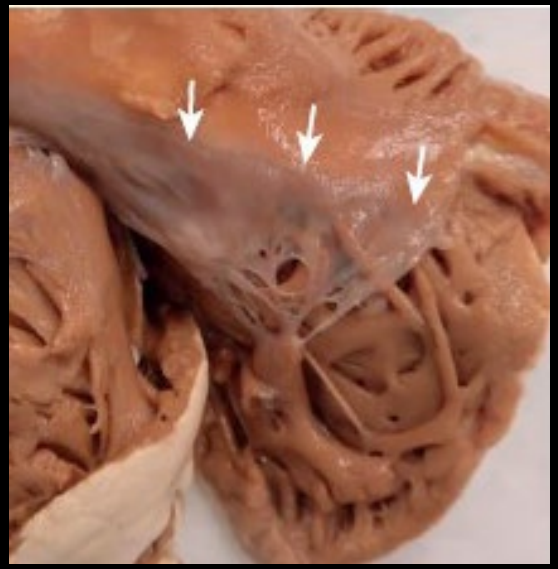
QA Fogg PhD, FRCPS(Glasg)
Associate Professor in Clinical Anatomy, The University of Melbourne









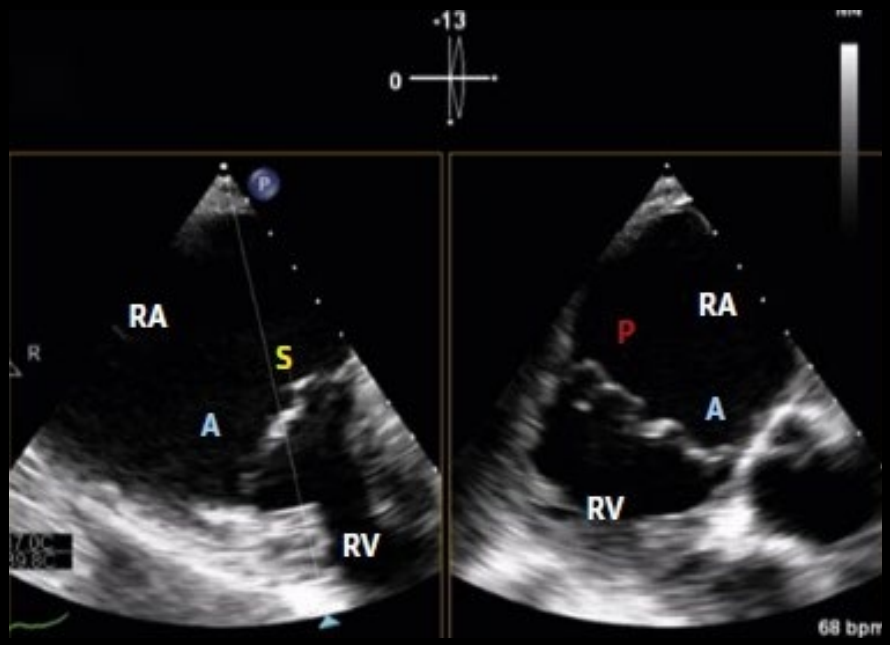


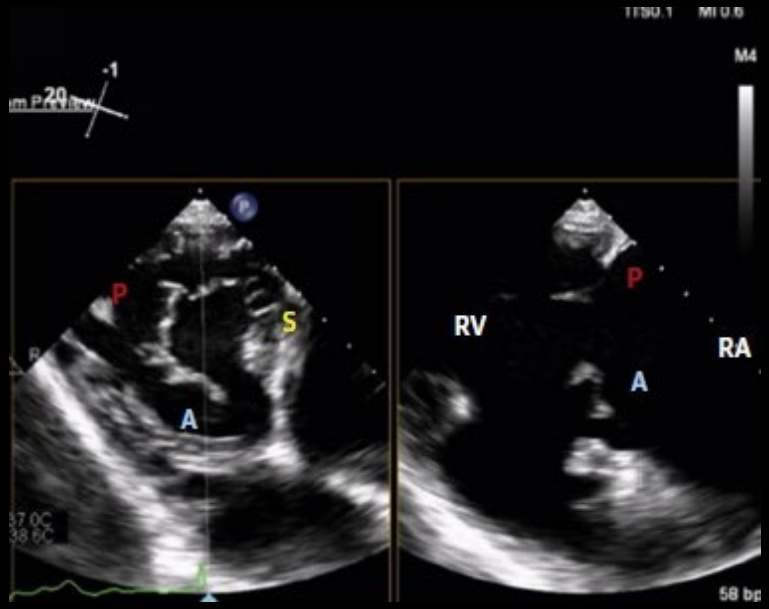
Cardiovascular Research Foundation®

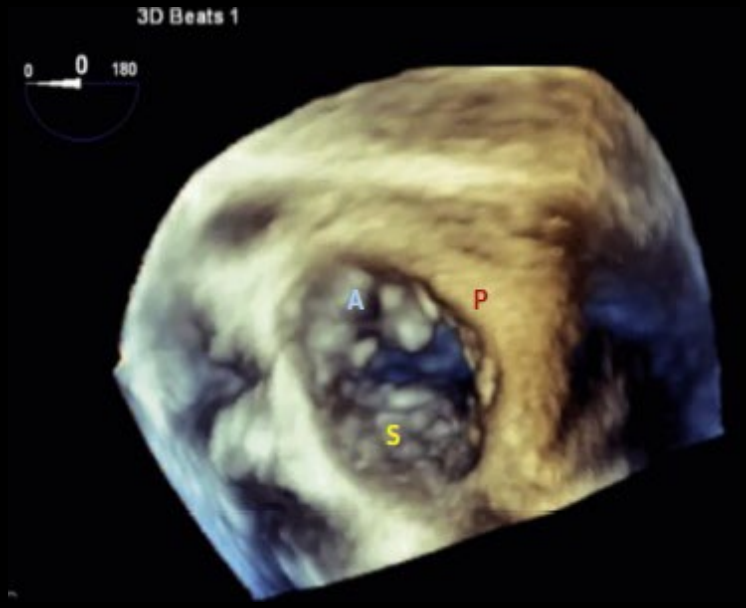
Dahou *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 458-468.

QA Fogg PhD, FRCPS(Glasg)
Associate Professor in Clinical Anatomy, The University of Melbourne

Tricuspid Valve Anatomy







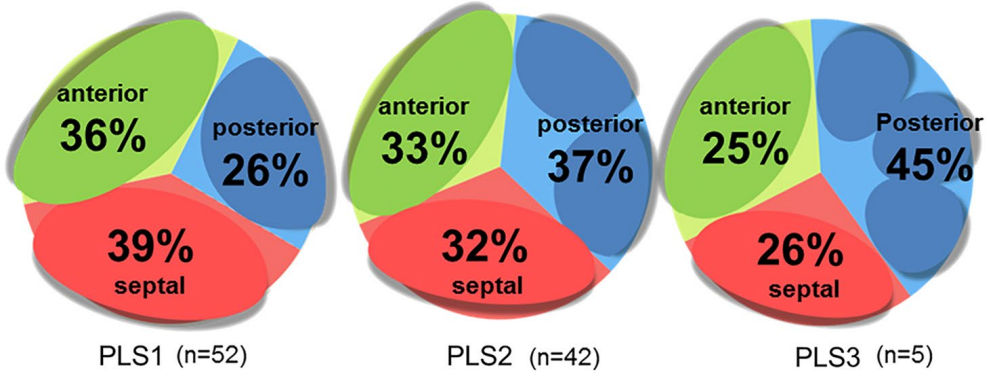
Muraru *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 500-515.

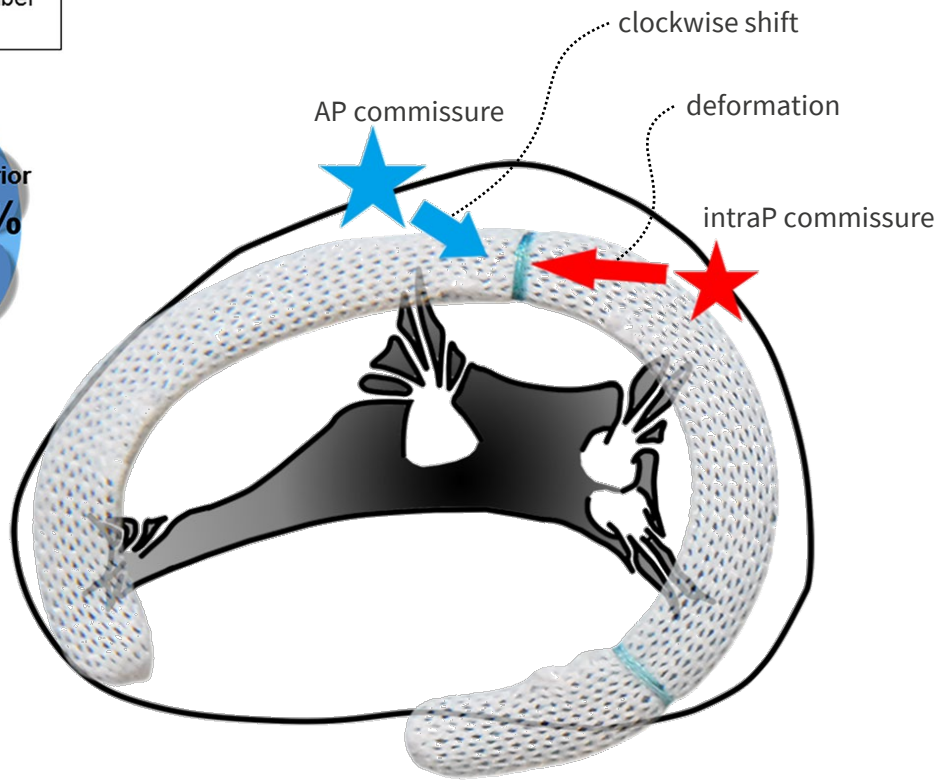
Leaflet Variation

- from 40 hearts: three leaflets 57.5%; four leaflets 42.5% (Holda *et al.*,2019)
- from 100 hearts: two leaflets 1%; three leaflets 52%; four leaflets 42%; five leaflets 5%

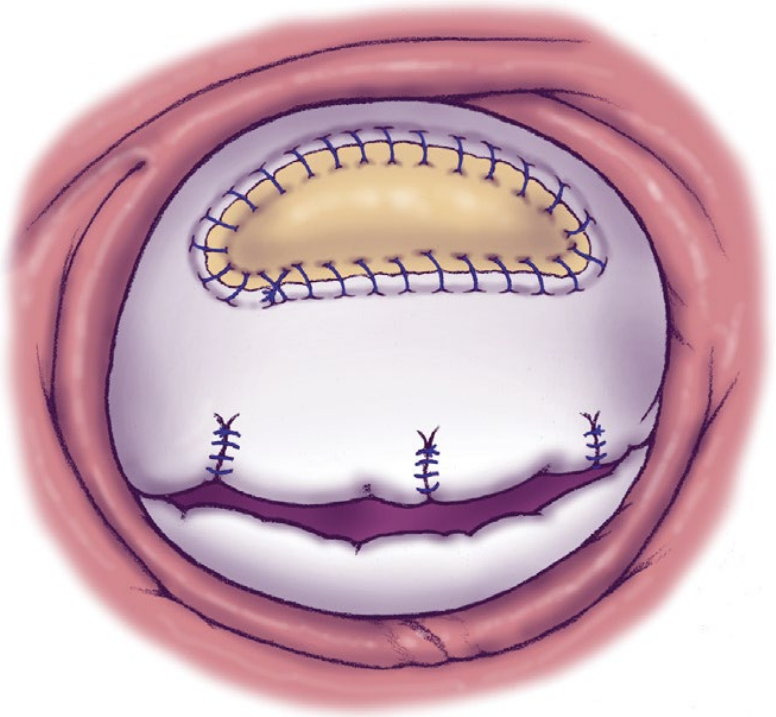
(Sakon *et al.*,2019)

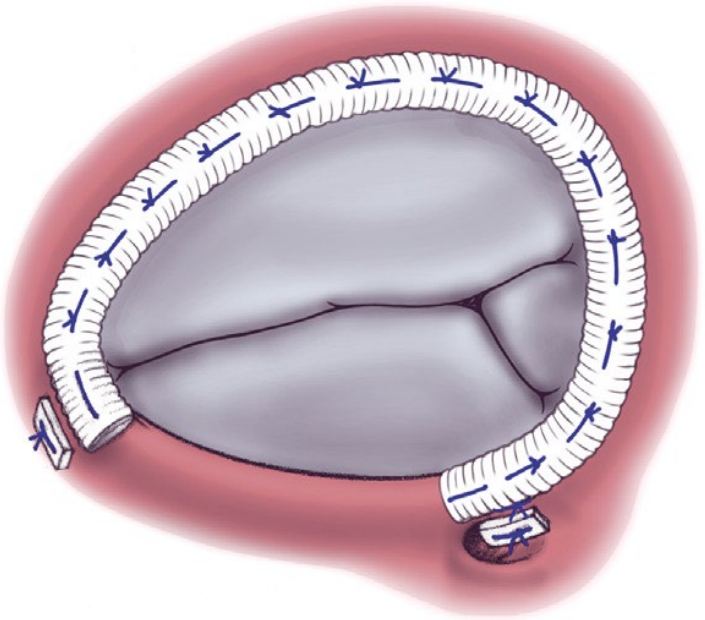
The median proportion of each leaflet the in tricuspid valve varies according to the number of posterior leaflet scallops.

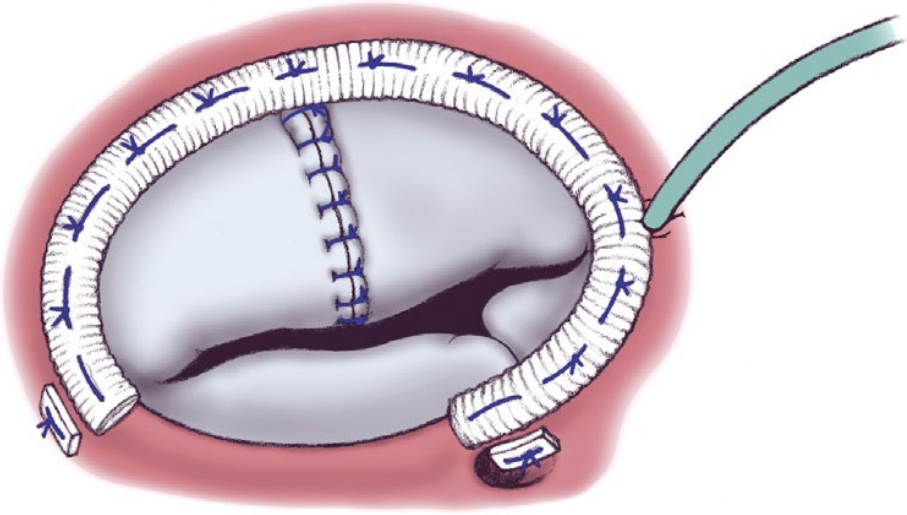




Sakon *et al.* (2019) *General Thoracic and Cardiovascular Surgery* **67:** 758-764.

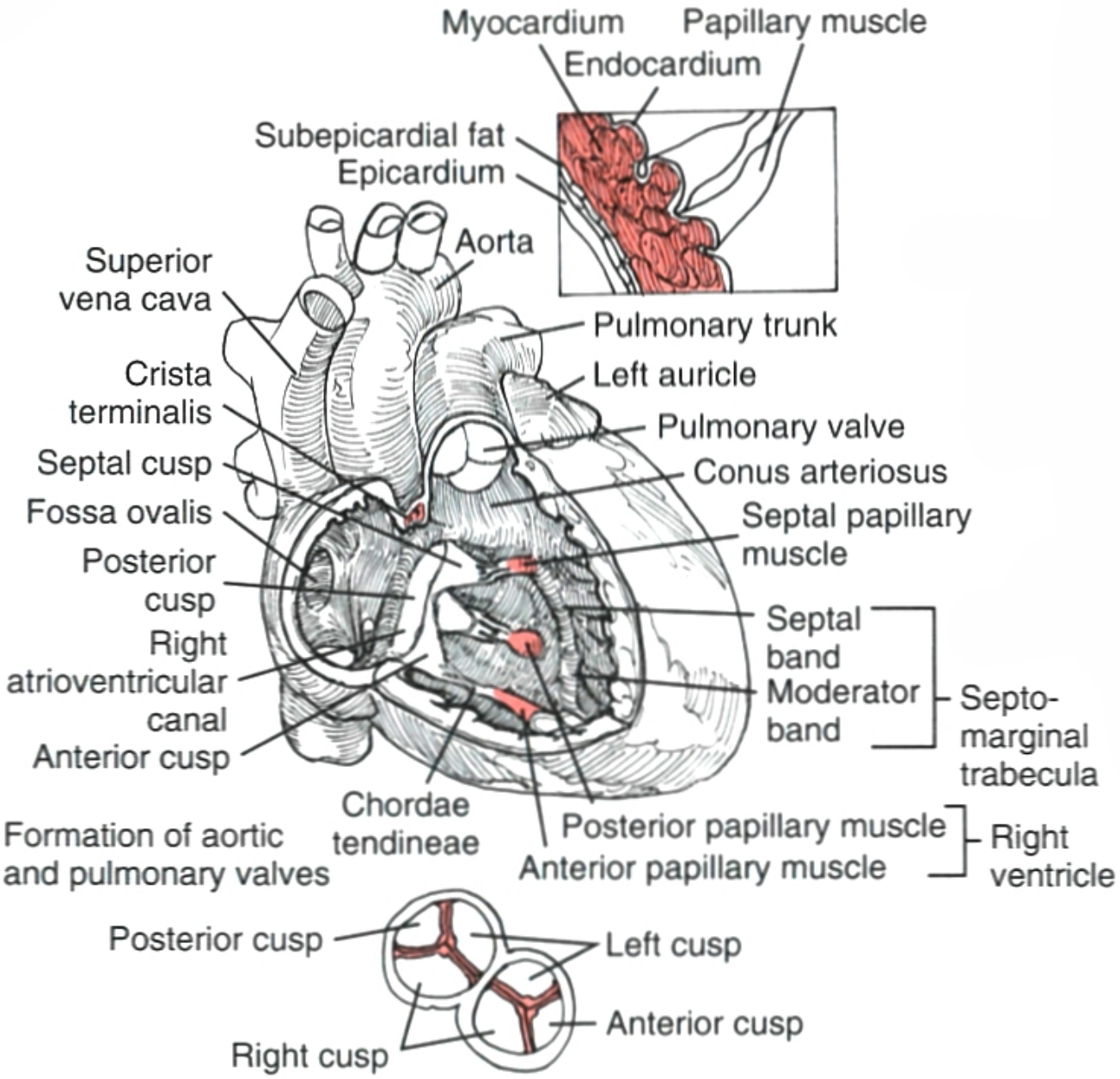




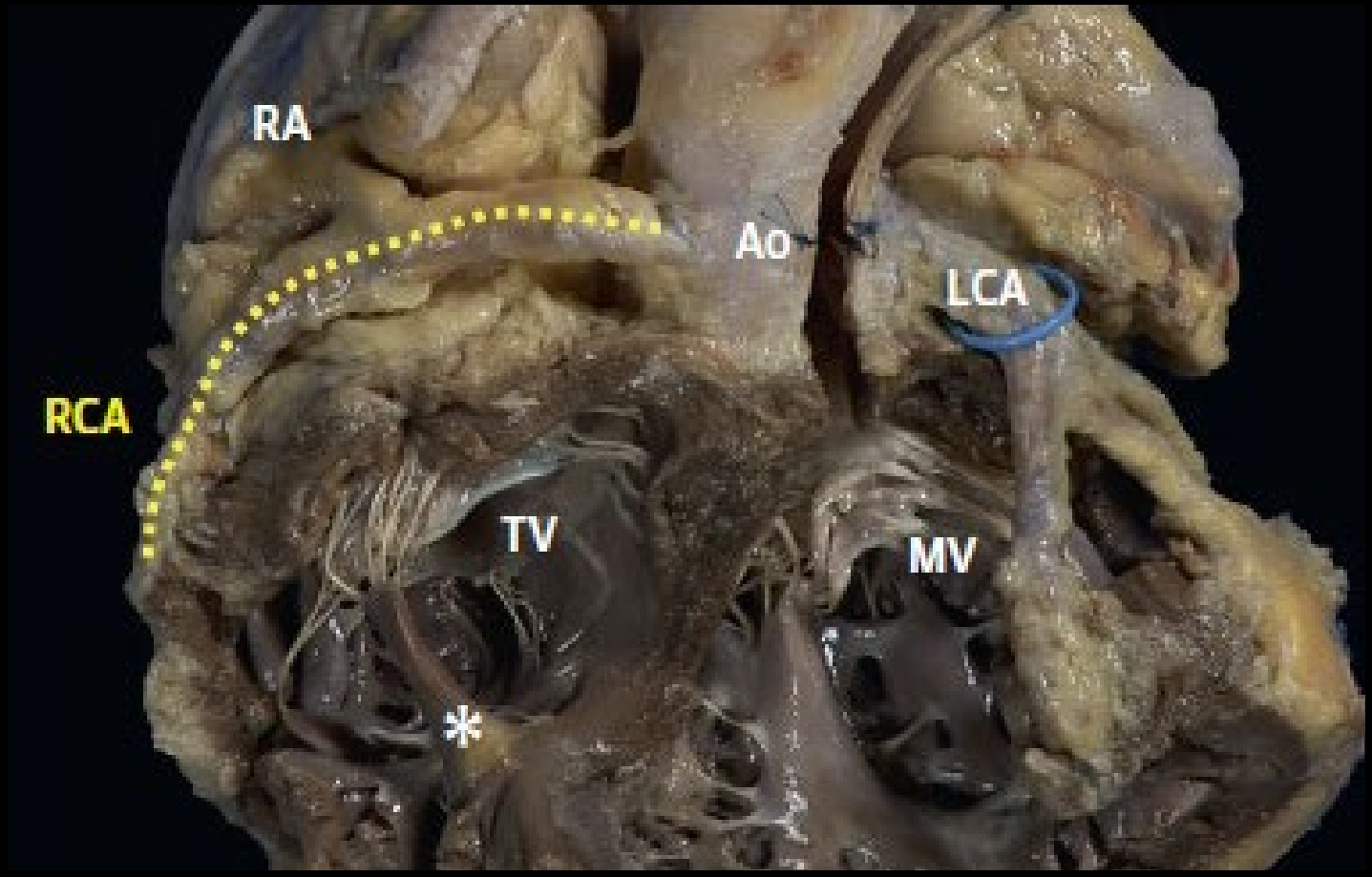


Saran and Dearani (2018) *Annals of Thoracic Surgery* **105:** 675-679.

ANTERIOR

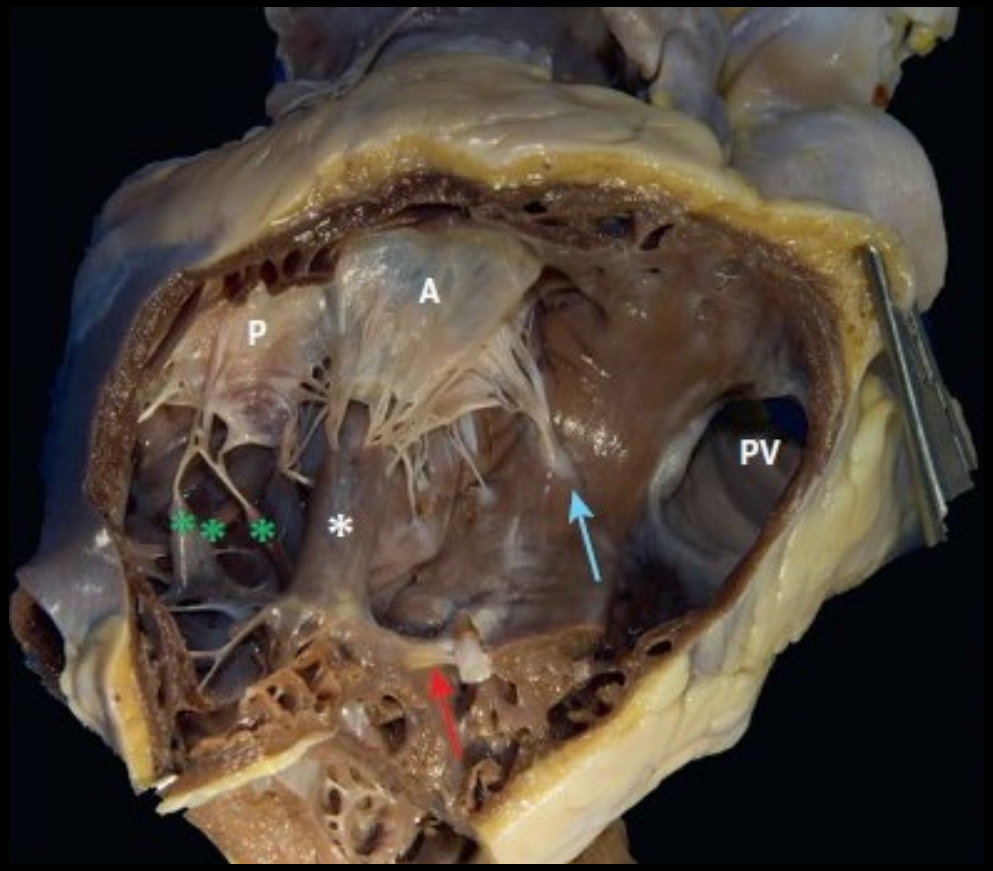


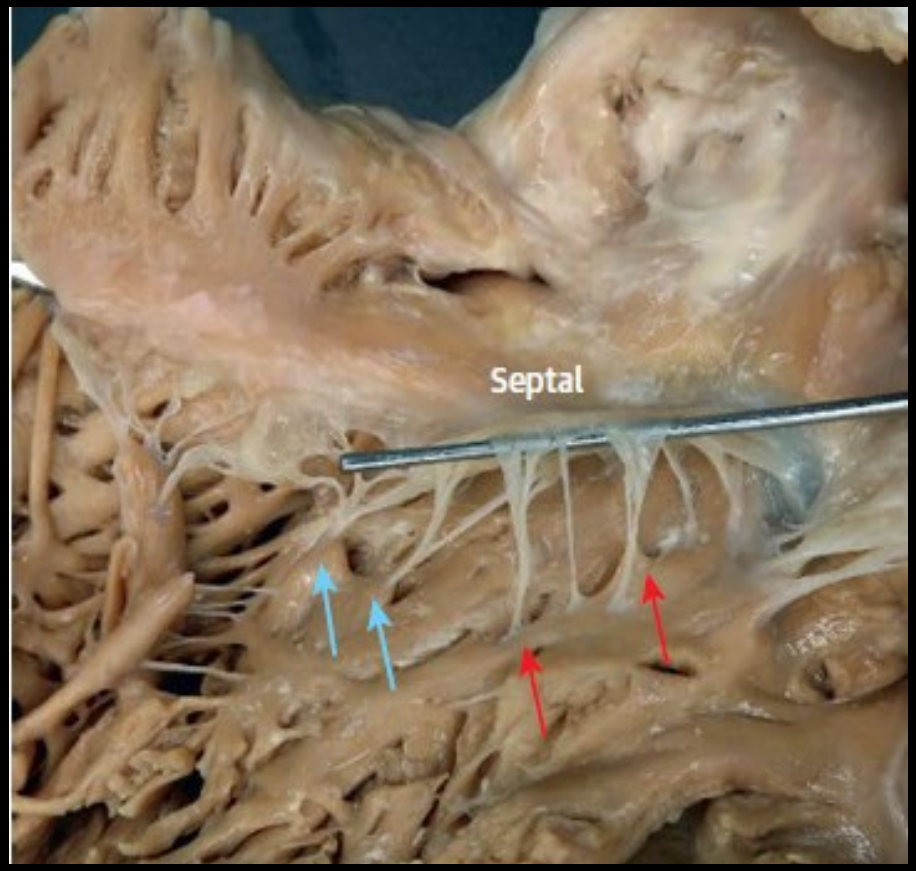
WJ Larsen (2002) *Anatomy: Development, Function, Clinical Correlations*. Saunders, USA.



Cardiovascular Research Foundation®

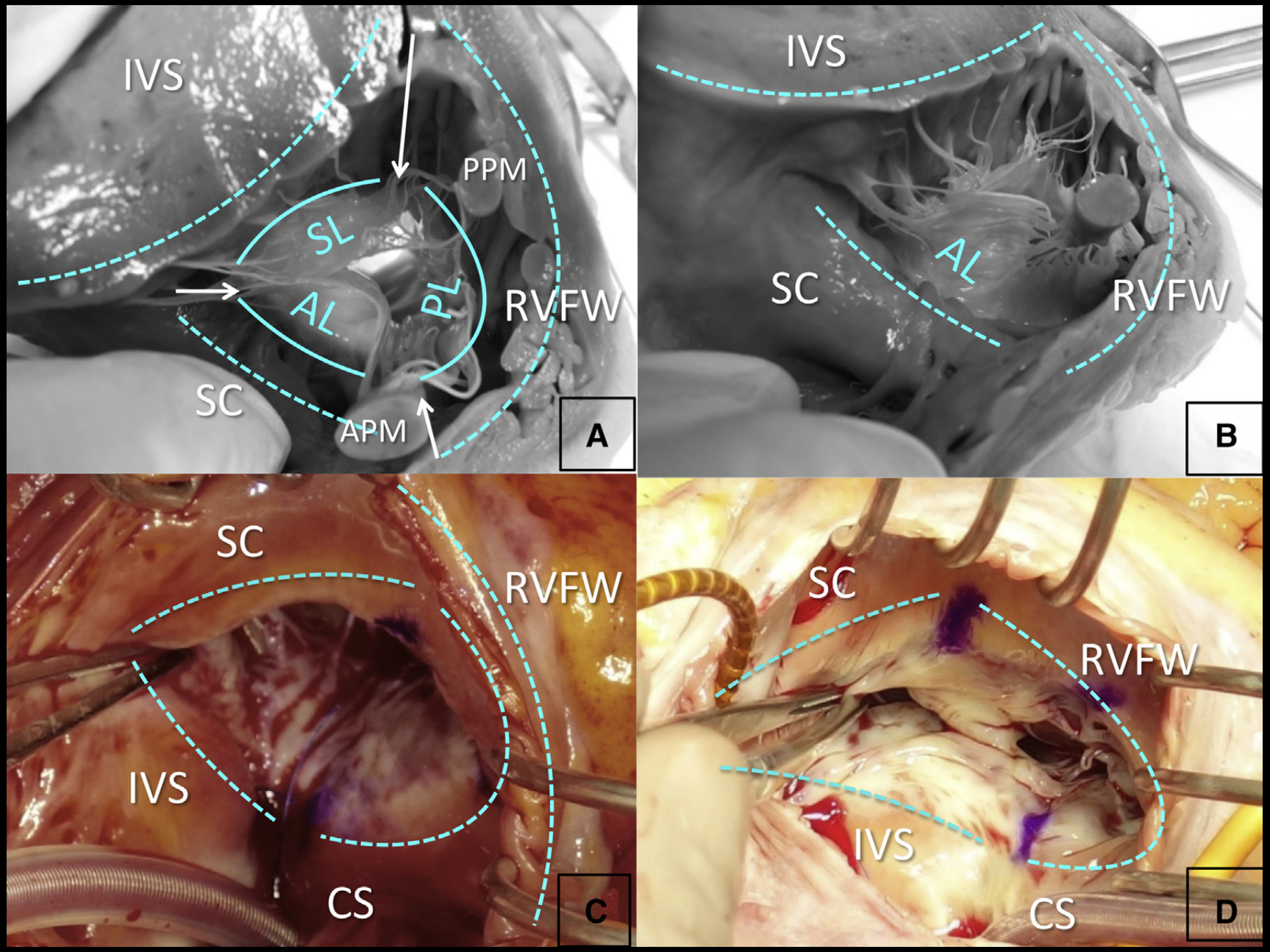
Dahou *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 458-468.





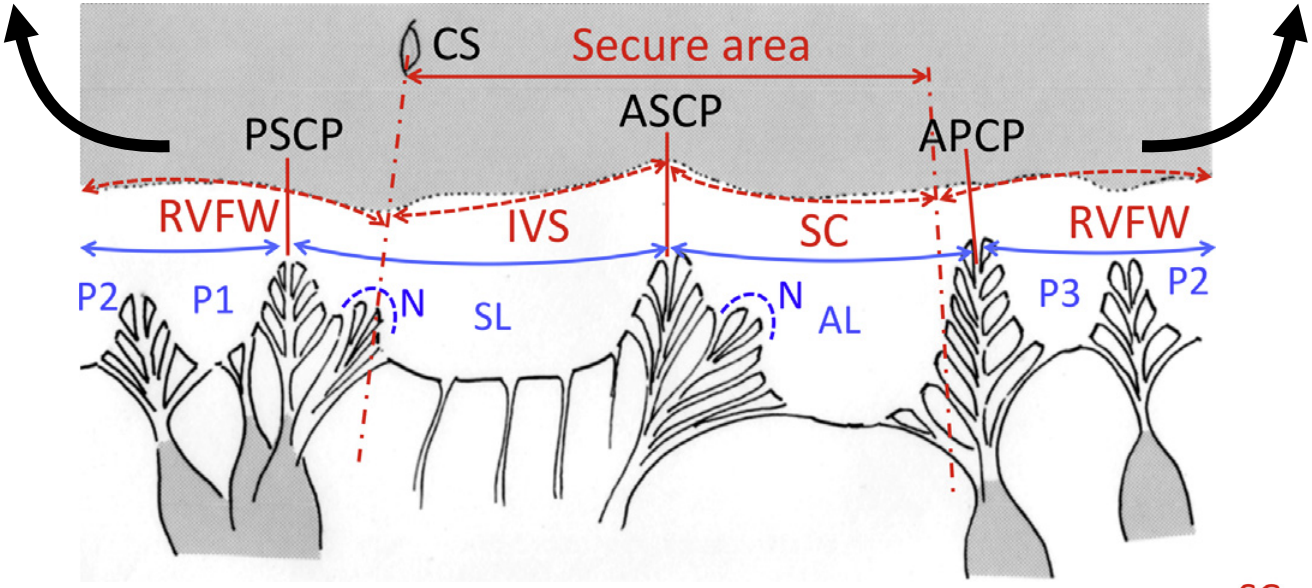
Cardiovascular Research Foundation®

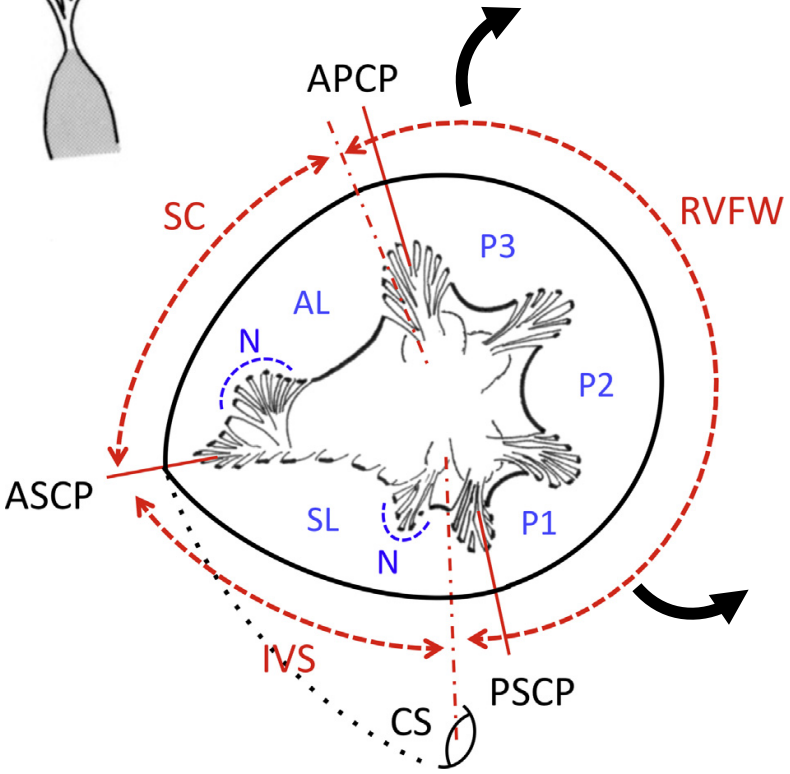
Dahou *et al.* (2019) *JACC: Cardiovascular Imaging* **12(3):** 458-468.



Kawada *et al*. (2019) *The Journal of Thoracic and Cardiothoracic Surgery* **155(4):** 1511-1519.

Distension through the “non-secure” segment of the annulus





Kawada *et al.* (2019) *The Journal of Thoracic and Cardiothoracic Surgery* **155(4):** 1511-1519.

Thank you

With thanks to:

- Chris and the organising committee
- the Fogg Lab team
- the Anatomical Services team at the University of Melbourne
- the Body Donors and their families

Please feel free to contact me:

quentin.fogg@unimelb.edu.au