Surgical and Electrical Anatomy of the Inter-Nodal and Intra-Atrial Conduction System in the Heart

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COI Disclosure

Jeong-Wook Seo:

The authors have no financial conflicts of interest to disclose concerning the presentation.

This presentation was in part published at Journal of Chest Surgery https://doi.org/10.5090/jcs.22.030 .

JCS
Journal of Chest Surgery
https://doi.org/10.5090/jcs.22.030
pISSN: 2765-1606 eISSN: 2765-1614
J Chest Surg. Published online M D, 2022

Check for updates

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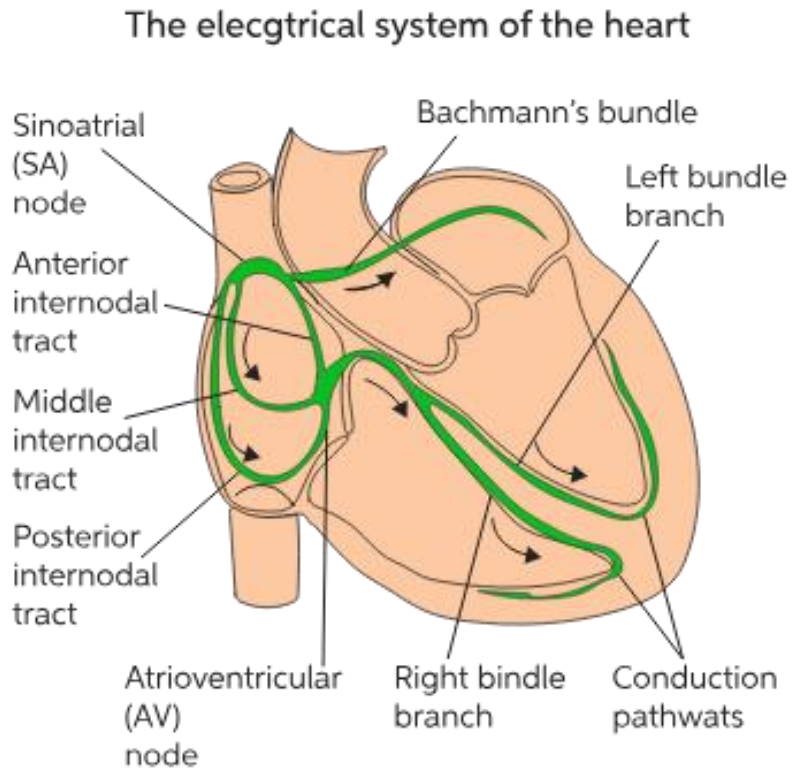
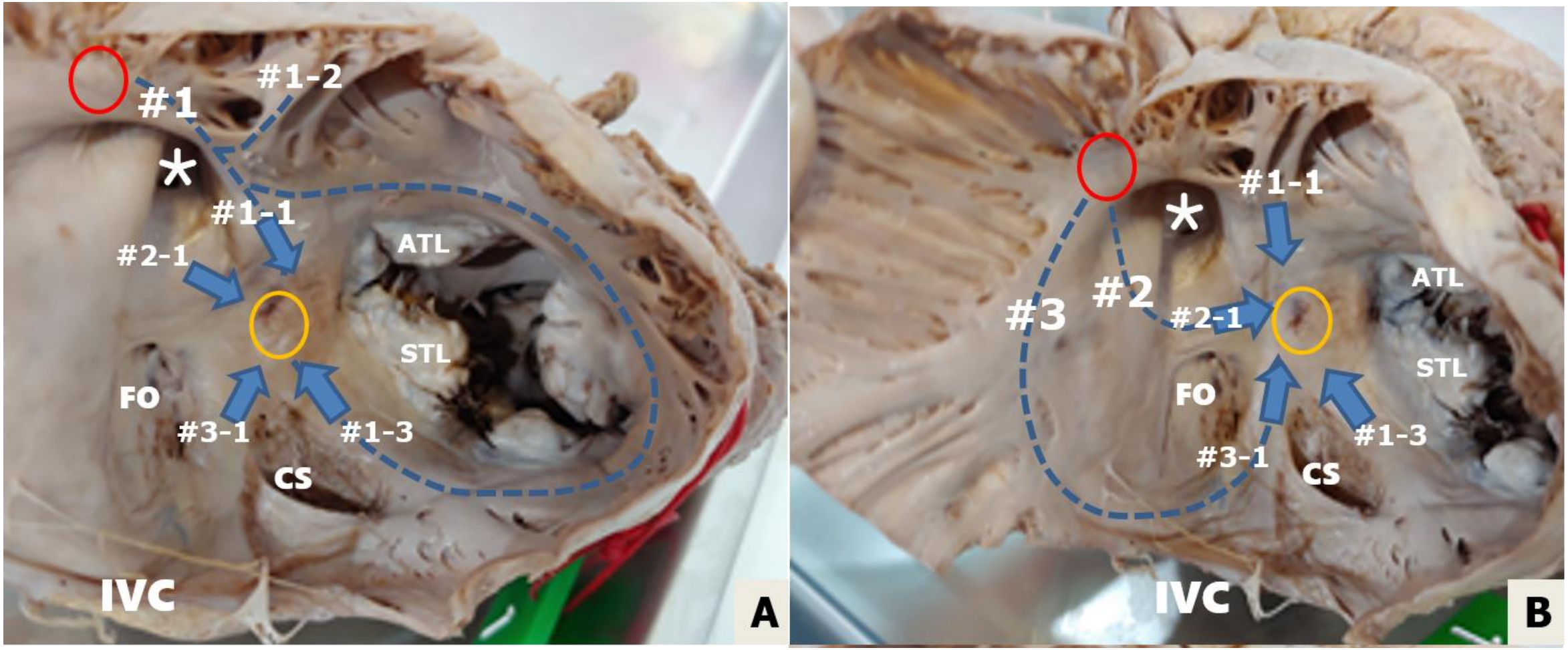
Anatomical substrates of atrial conduction and arrhythmia



- Inter-nodal tract
- Inter-atrial / intra-atrial conduction
- Maze operation
- Changes in atrial conduction
  - By aging / atrial dilatation / surgical incisions

- Bachmann's bundle
- Cavo-tricuspid isthmus
- Slow pathway vs fast pathway
- Macro re-entry circuits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IVC
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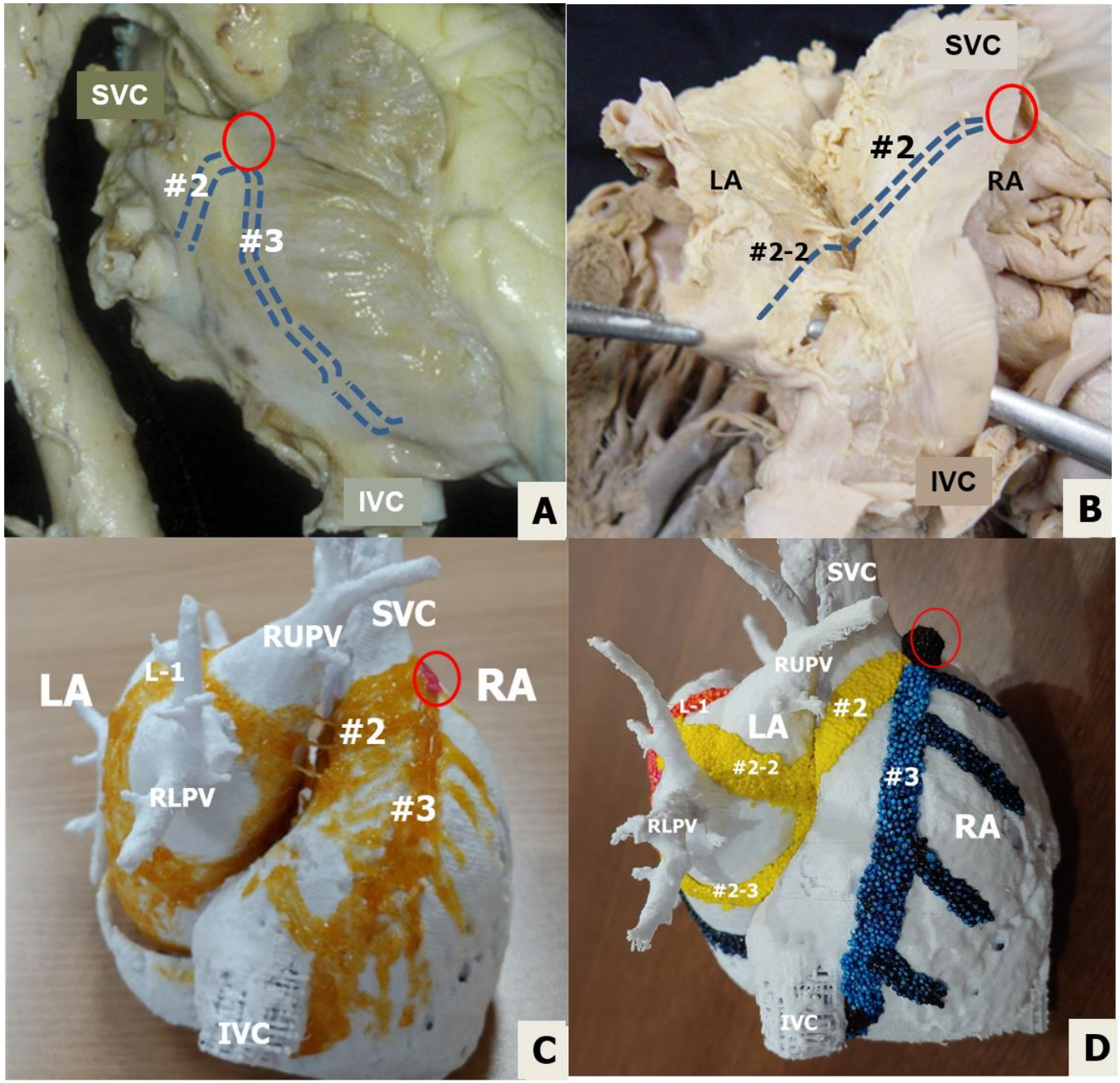
CS
IVC
B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RLPV
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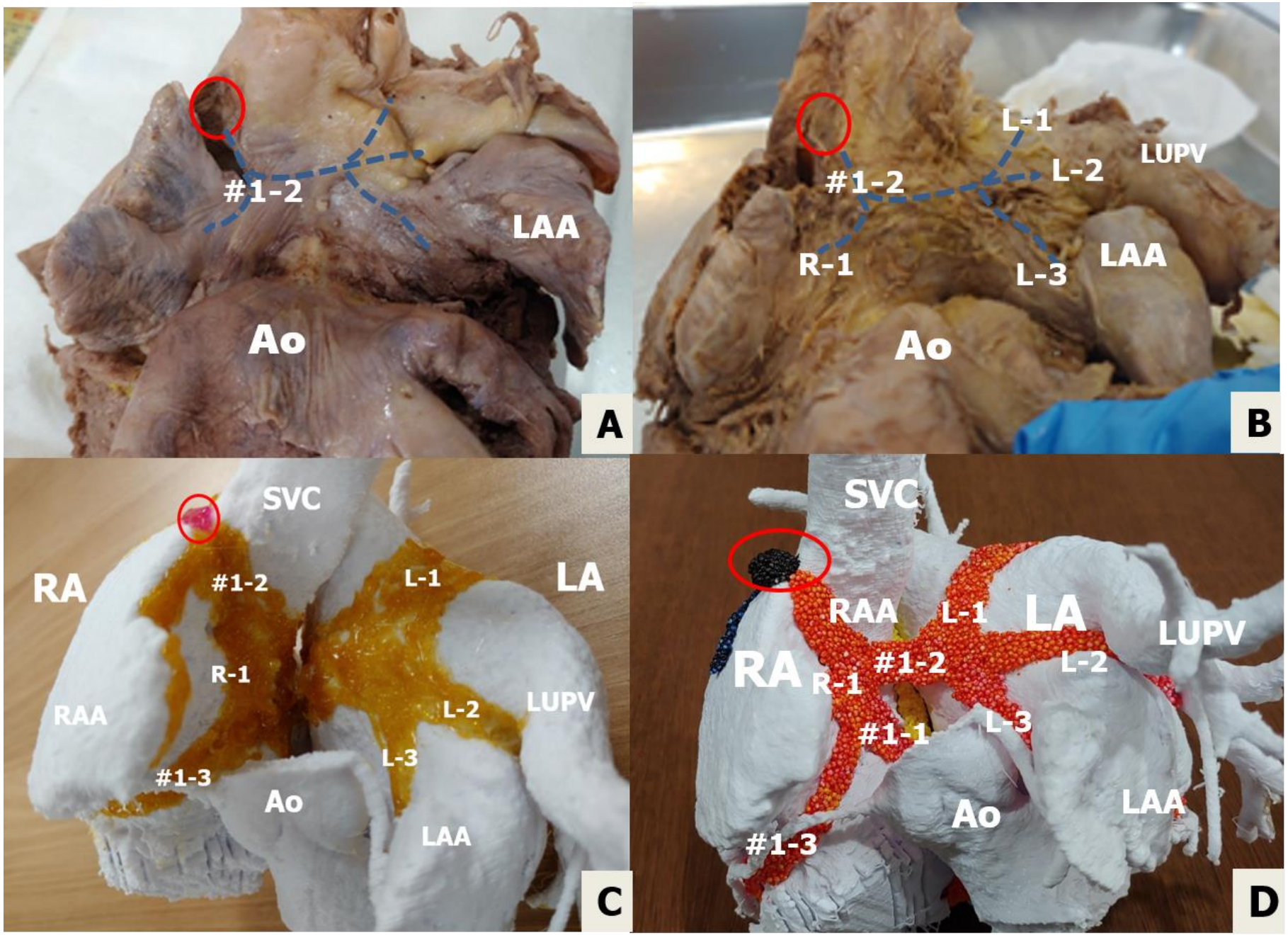
IVC
D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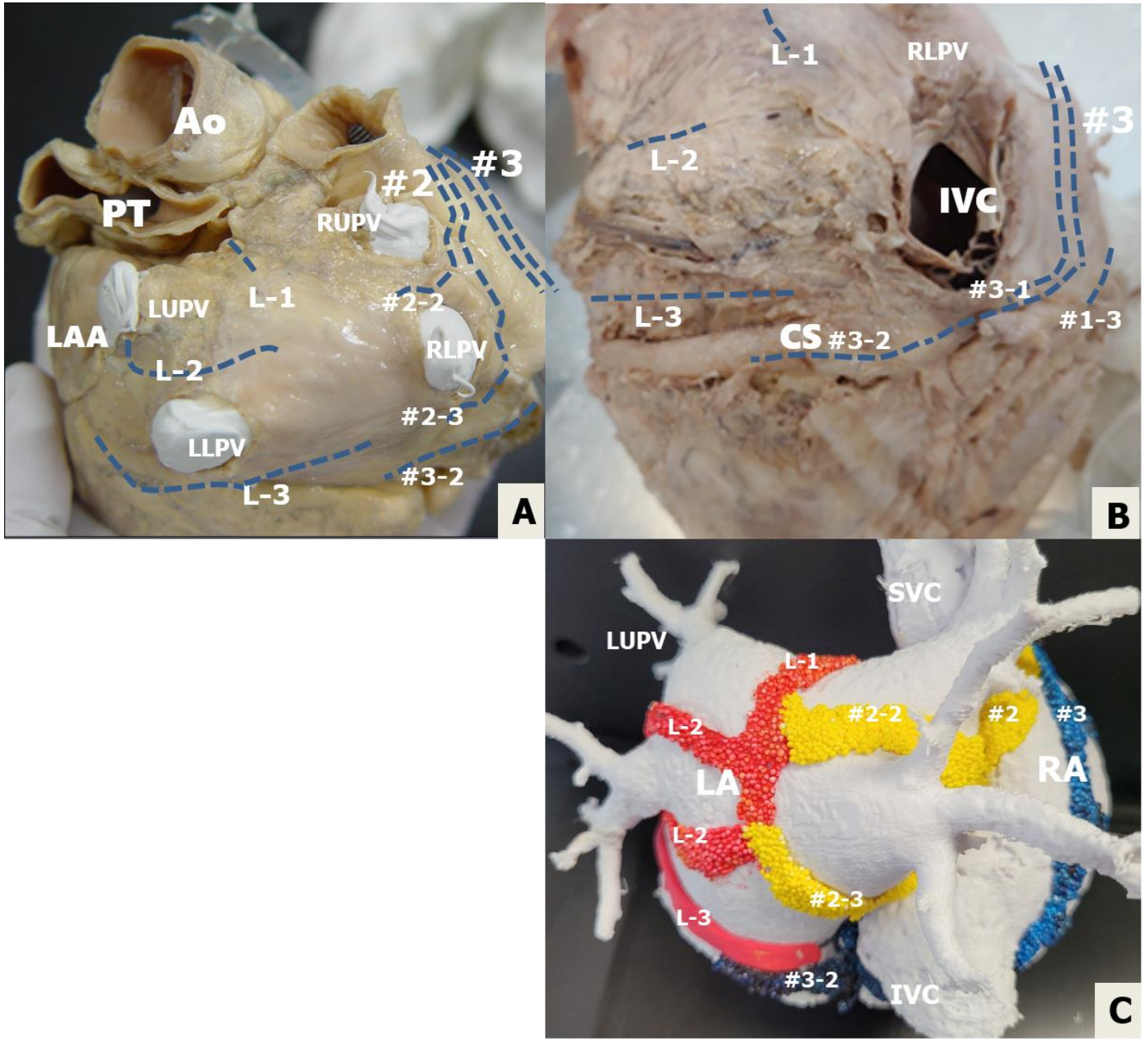
D

KHRS 2023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LUPV
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#2-2
#2
#3
L-2
LA
RA
L-2
#2-3
L-3
#3-2
IVC
C

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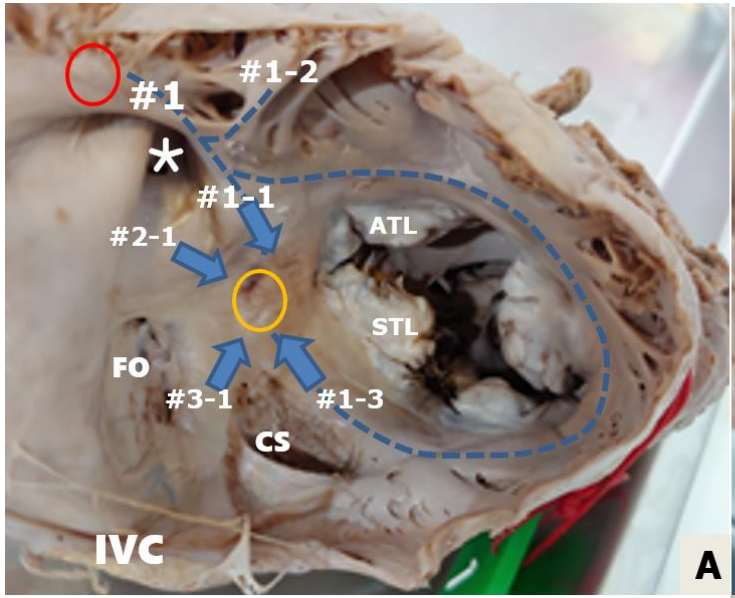
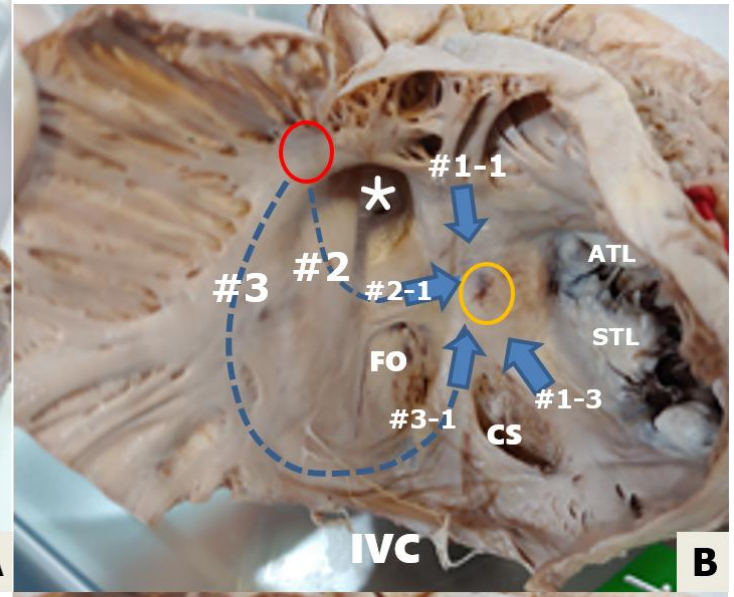
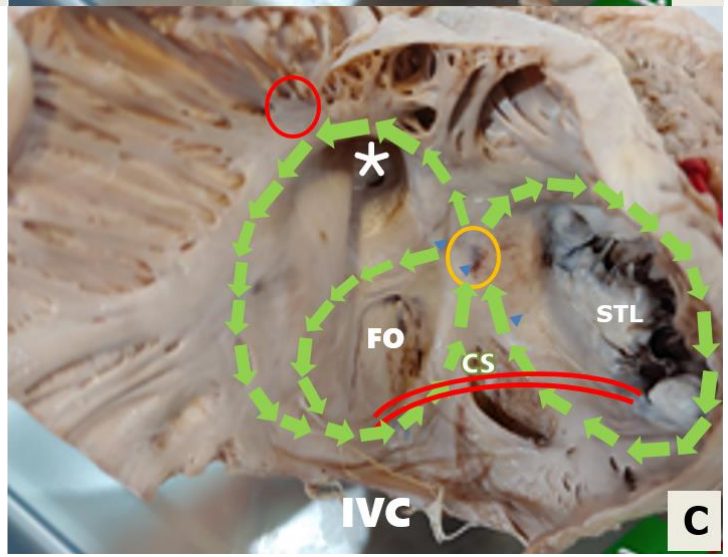
Summary

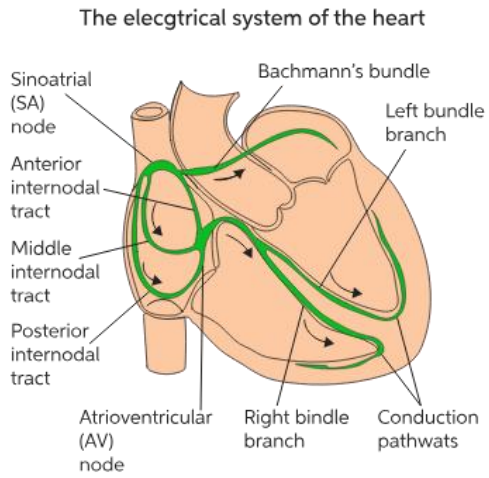
- From the sinus node: 3 routes
  - Anterior to Bachmann's: #1
  - Middle to superior limbus: #2
  - Posterior: crista terminalis: #3
- To the AV node: 2 approaches
  - Anterior approach through #1 and #2
  - Posterior approach through #1 and #3
- To the left atrium
  - Anterior wall through #1
  - Posterior wall through #2 and #1
- To the right atrium
  - Right wall through #3
  - Medial wall through #1

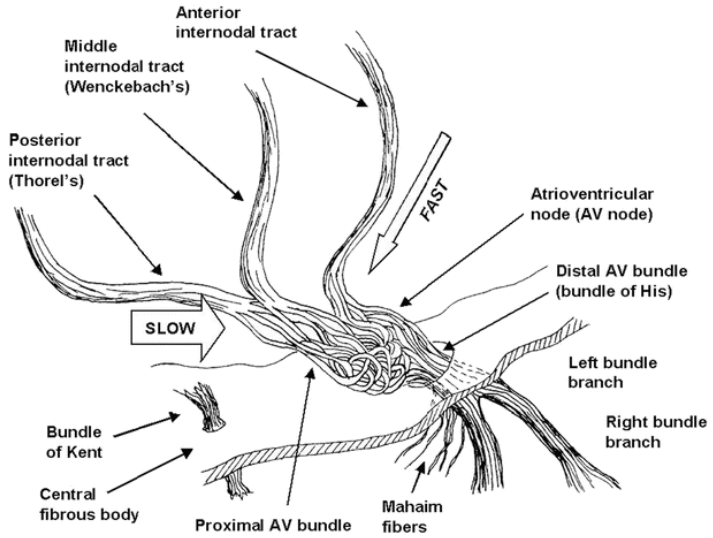


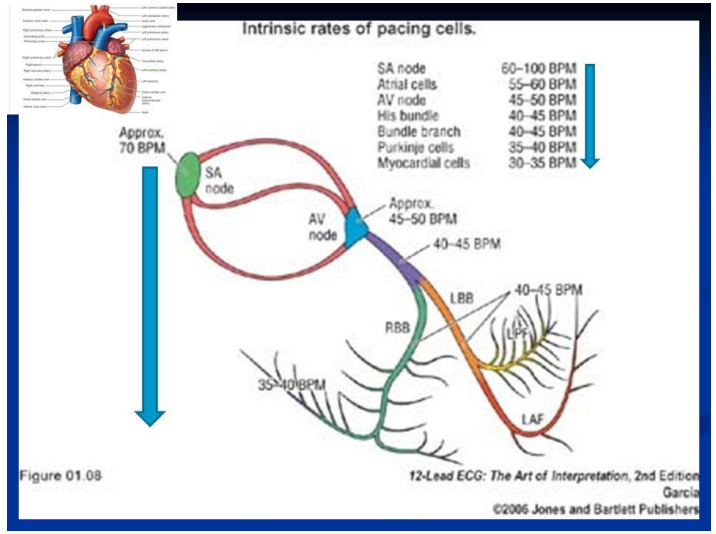


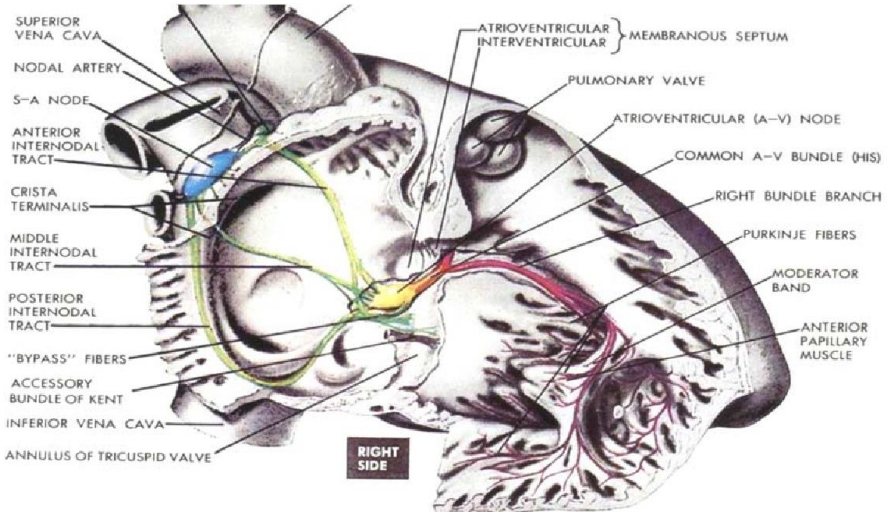


Classical diagrams after James TN









A concise review on the anatomy of the atrioventricular node in mammals
•A. Nabipour 2009

[Cardiac conduction system Thoracic key](clinicalpub@gmail.com).

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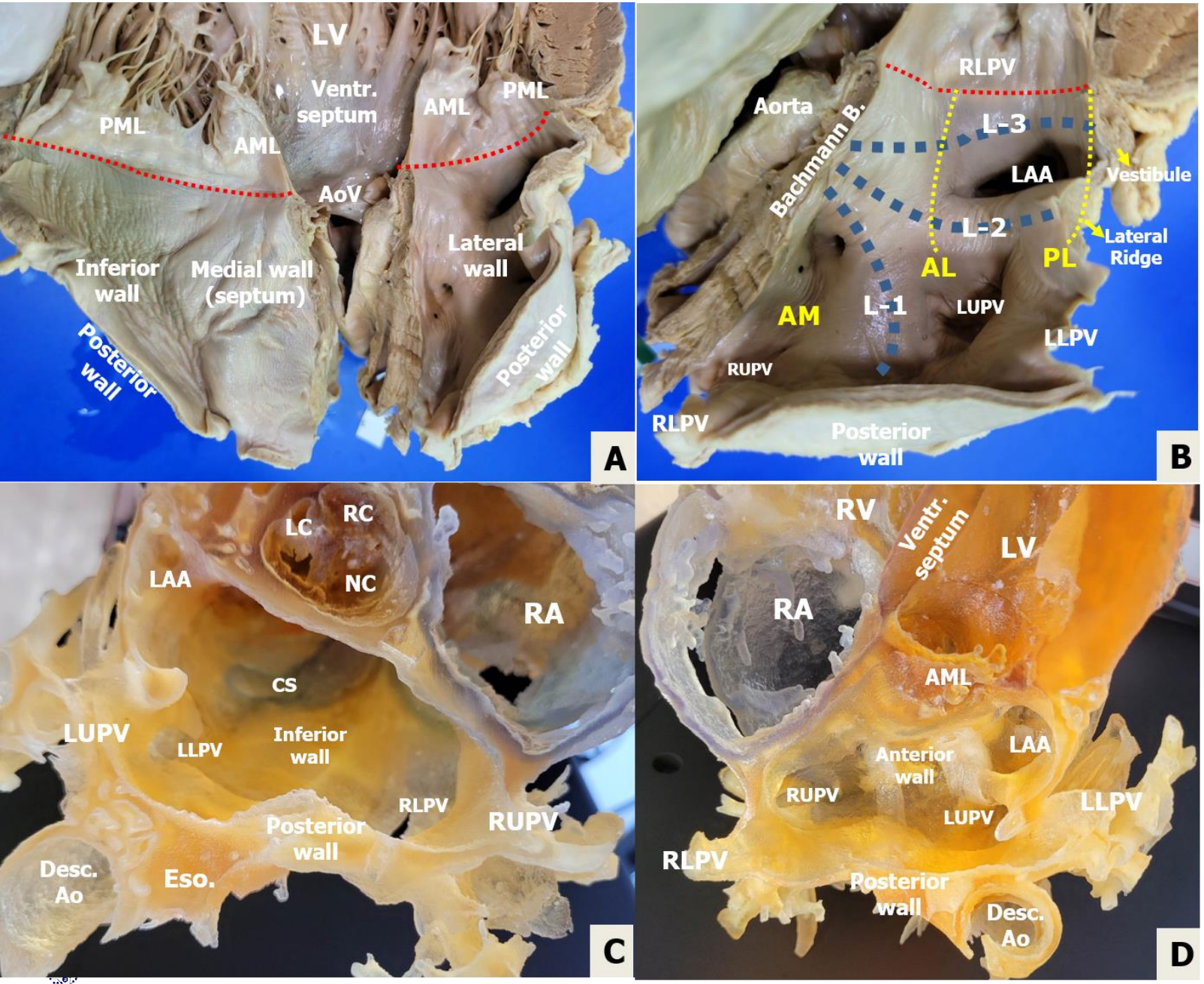
Classical description of bundles

- Crista terminalis
- Pectinate muscle
- Vestibules, supra-mitral, supra-tricuspid
- Lateral ridge
- Myocardial sleeve
- Limbus of fossa ovalis
- Wenckebach (1907)
- Thorel (1910)
- Bachmann (1916)

Material and methods

- "Normal" hearts in the heart collection of heartmuseum
  - Anatomical inspection and histology
- "Old" hearts at National Yang Ming Chiao Tung Univ., Taiwan
  - Blunt dissection of muscle after lysis of epicardial fat
- CT scan of hearts from patients with atrial fibrillation
  - 3-dimensional modeling of myocardium and de-lamination


LV
Ventr. septum
AML
PML
PML
AML
AoV
Lateral wall
Inferior wall
Medial wall (septum)
Posterior wall
Posterior wall
A
RLPV
Aorta
Bachmann B.
L-3
LAA
Vestibule
L-2
Lateral Ridge
AL
PL
AM
L-1
LUPV
LLPV
RUPV
RLPV
Posterior wall
B
LC
RC
LAA
NC
RA
CS
LUPV
LLPV
Inferior wall
RLPV
RUPV
Posterior wall
Desc. Ao
Eso.
C
RV
Ventr. septum
LV
RA
AML
LAA
Anterior wall
RUPV
LUPV
LLPV
RLPV
Posterior wall
Desc. Ao
D