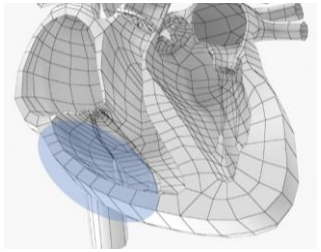
VDI UHF-ECG ATLAS

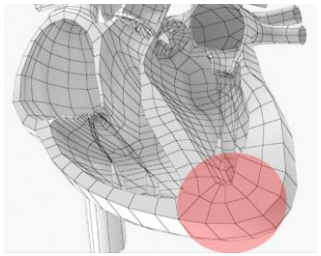
www.vdimaging.com/atlas

04.17.2025, rev. 5

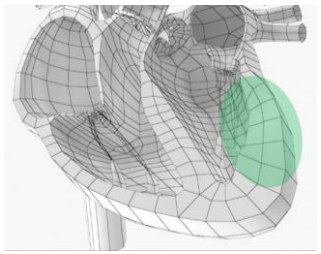
UHF-ECG activation map



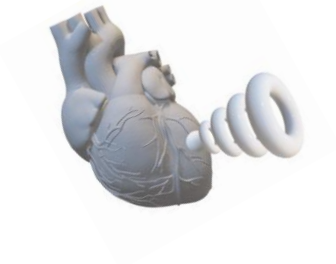
Right ventricle
+ septum

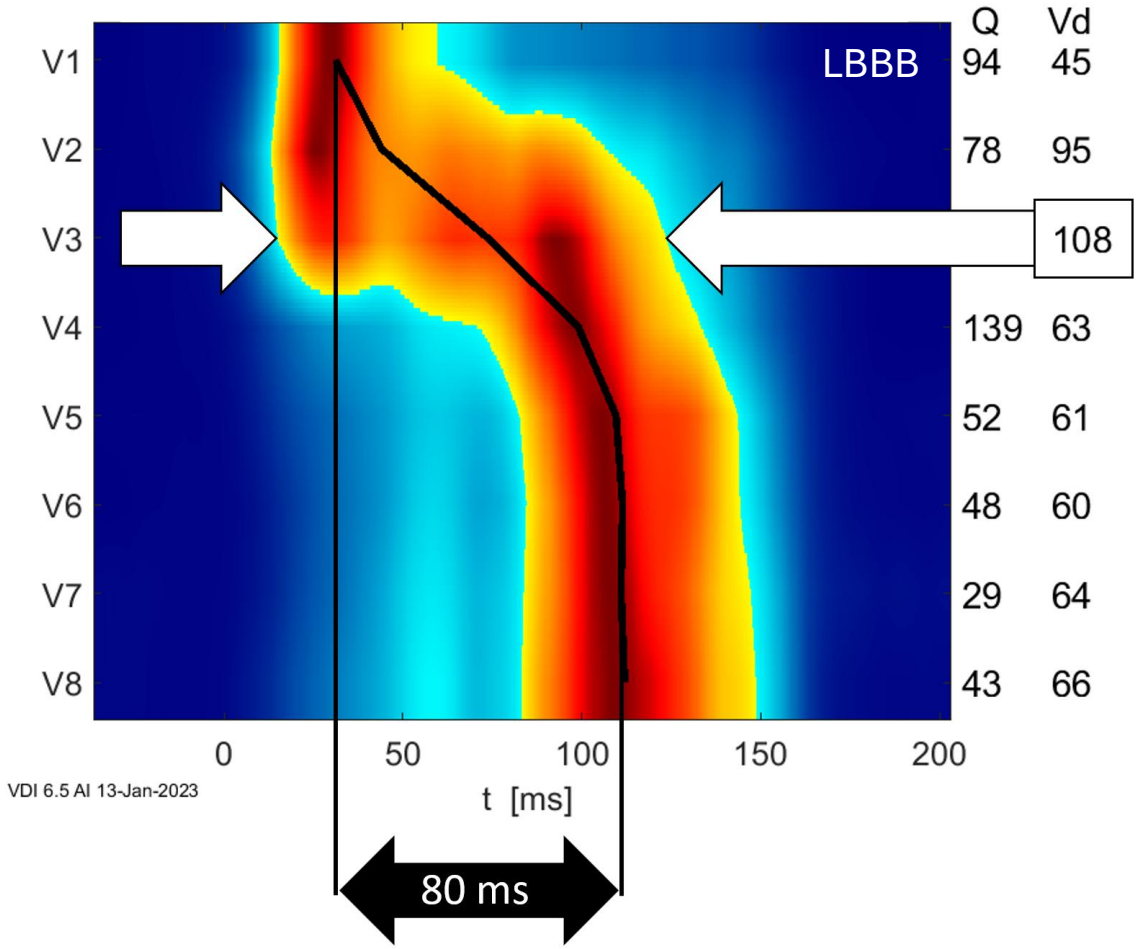


Apex



Free wall of the
left ventricle



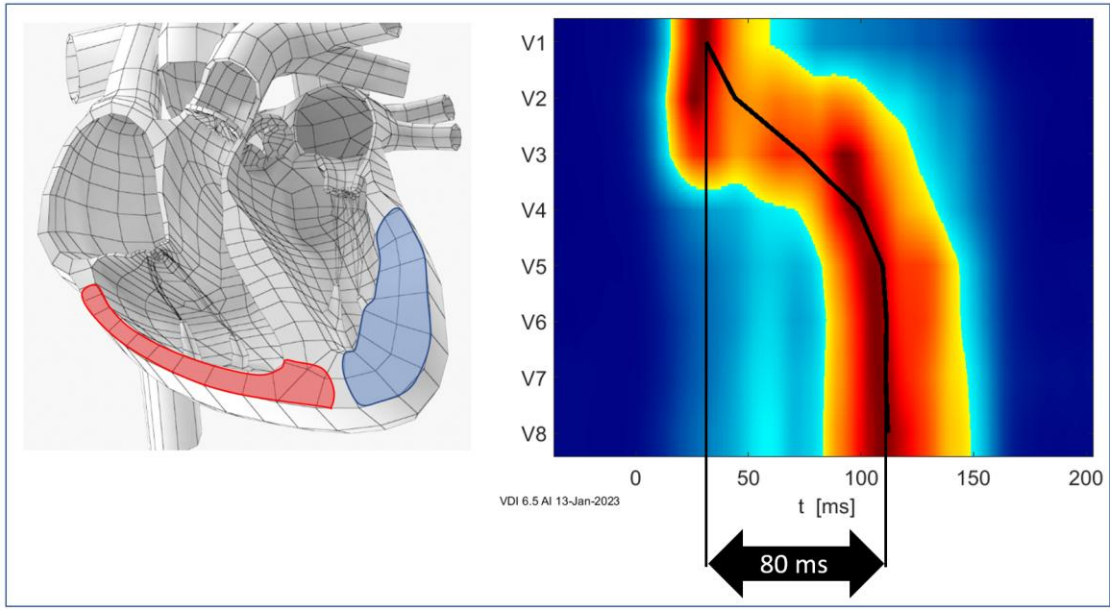


VD

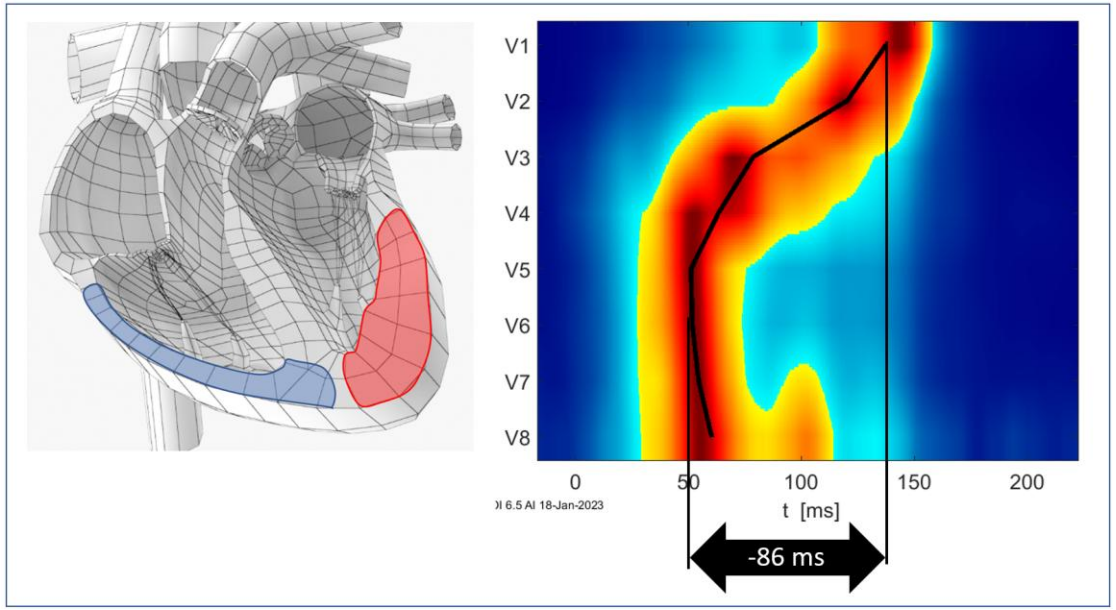
LOCAL DEPOLARIZATION DURATION

VED – Ventricular Electrical Dyssynchrony

UHF-ECG activation map

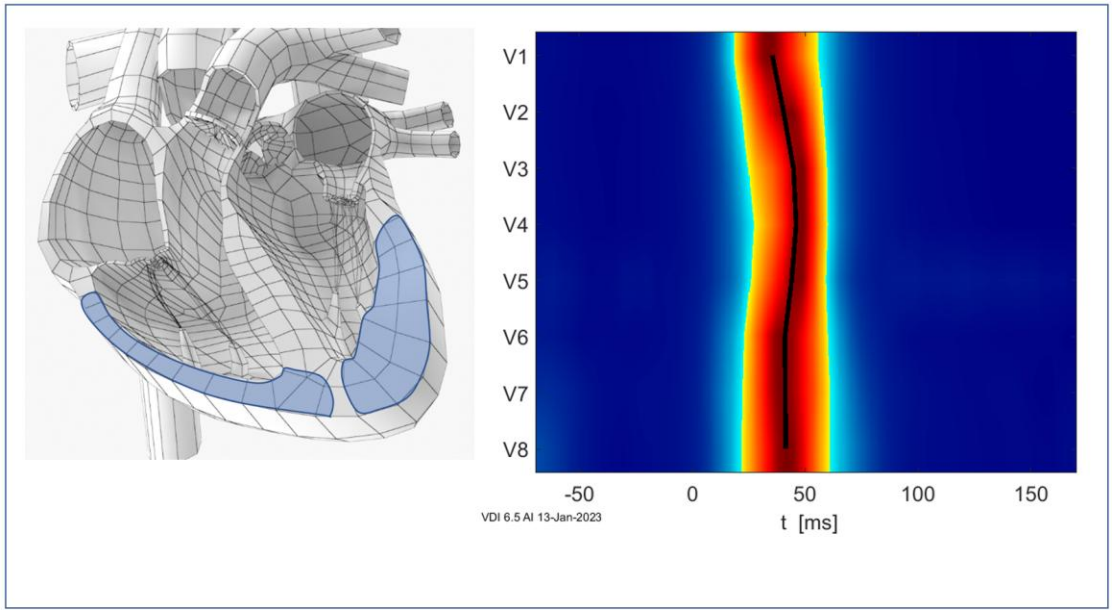


NORMAL



LEFT

LV delayed



RIGHT

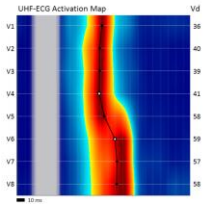
RV delayed

UHF-ECG ventricular electrical dyssynchrony

VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

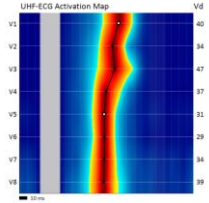
Brady

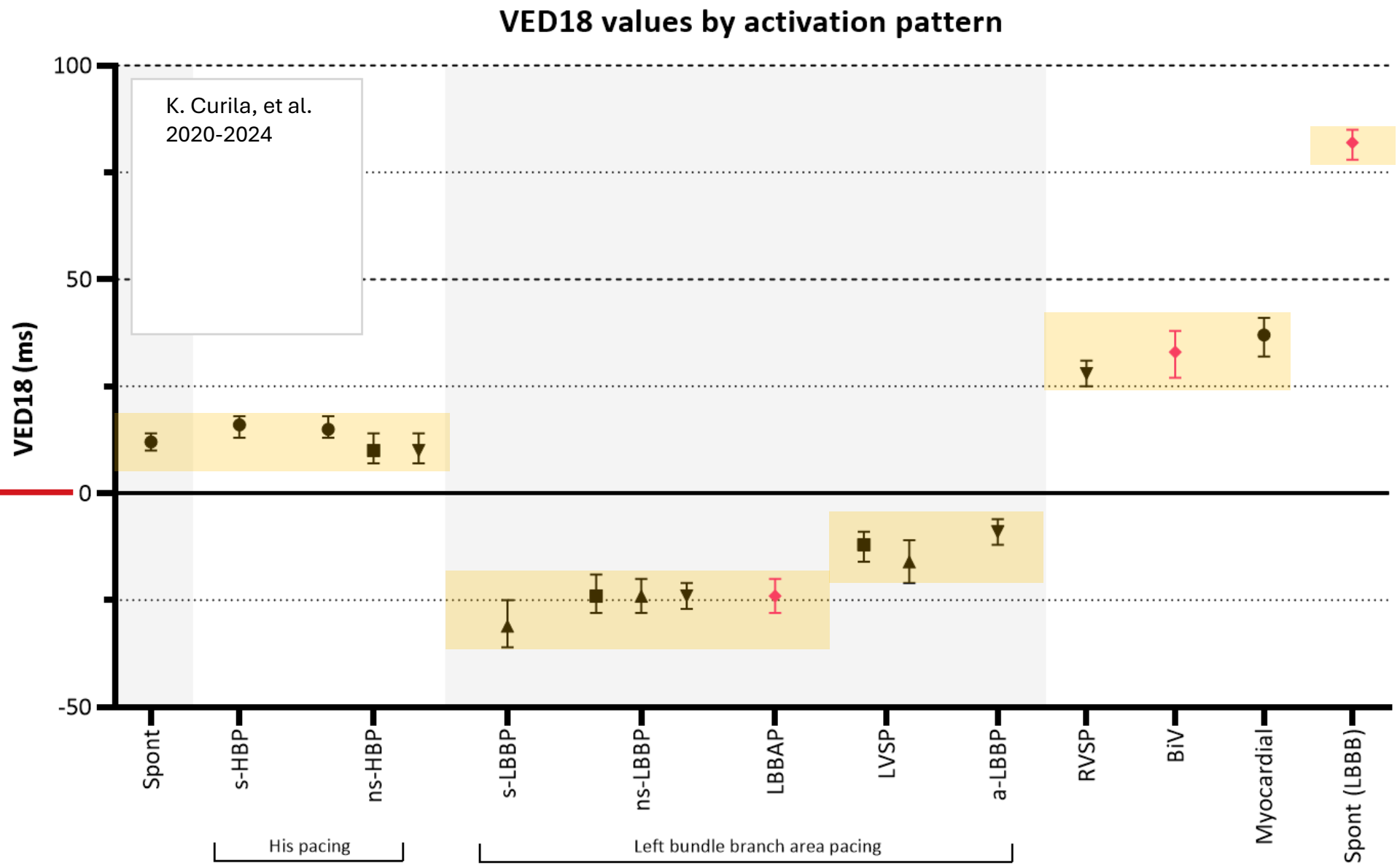
HF



LEFT

RIGHT



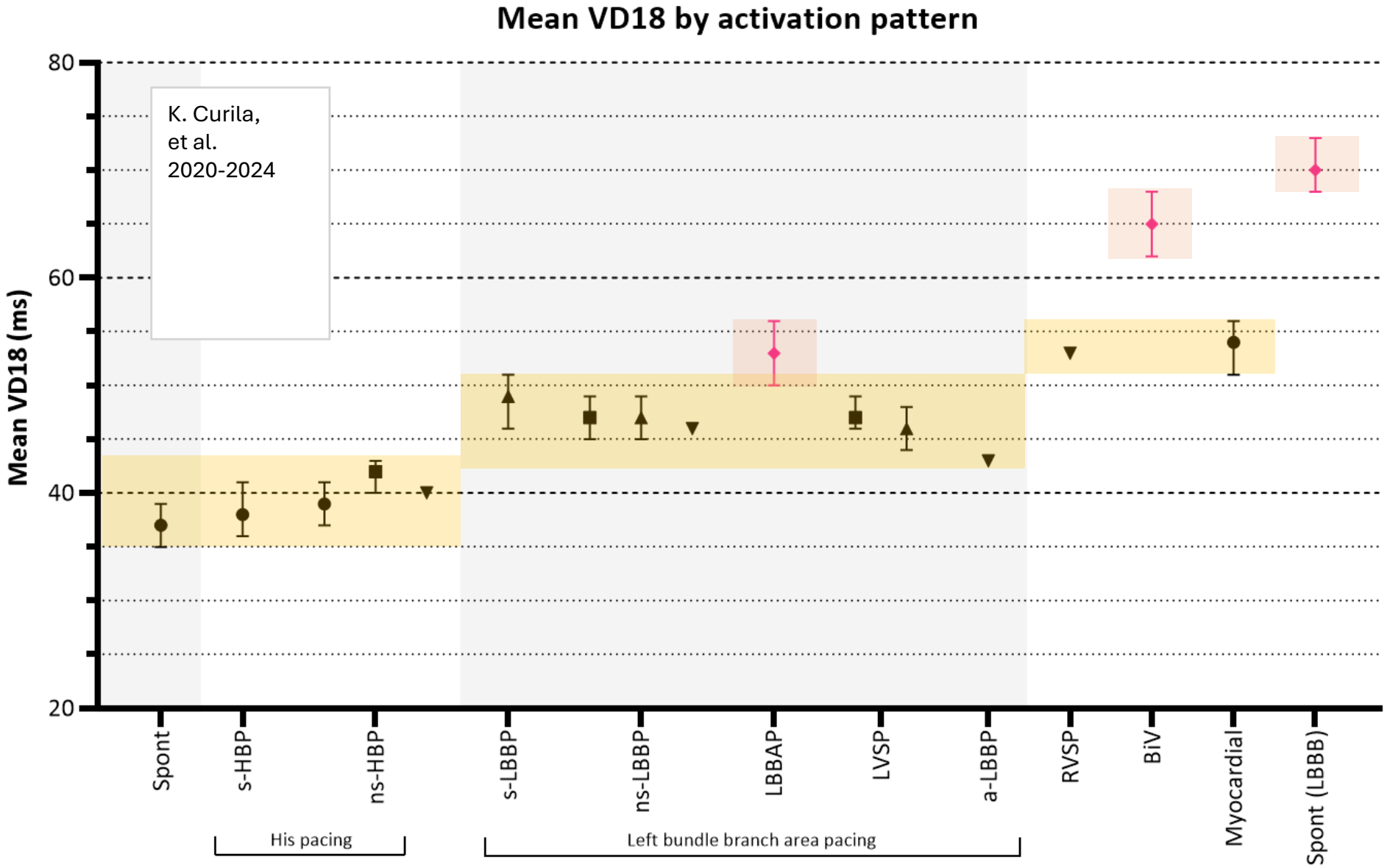


UHF-ECG local activation duration VD

VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

Brady

HF



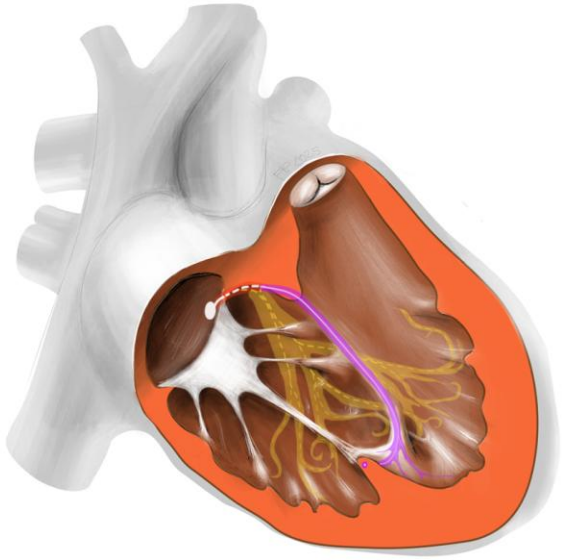
Collection 1

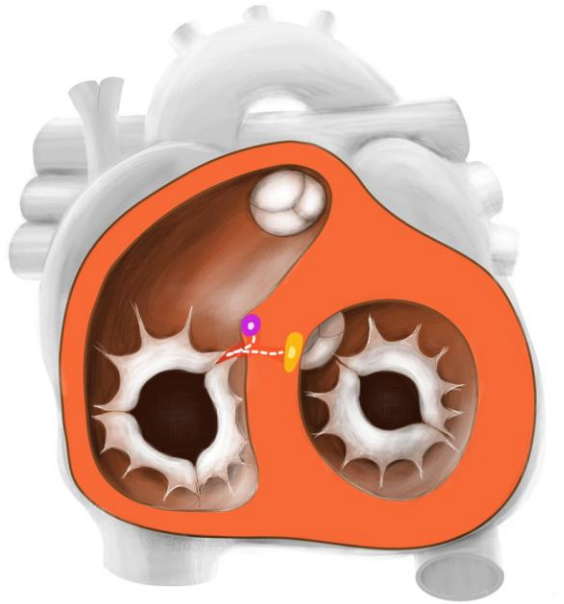
Spontaneous Activation

Examples

Collection 1: Spontaneous Activation Examples (1/7)

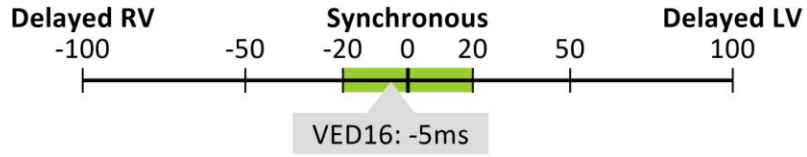
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

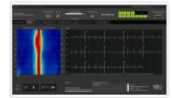


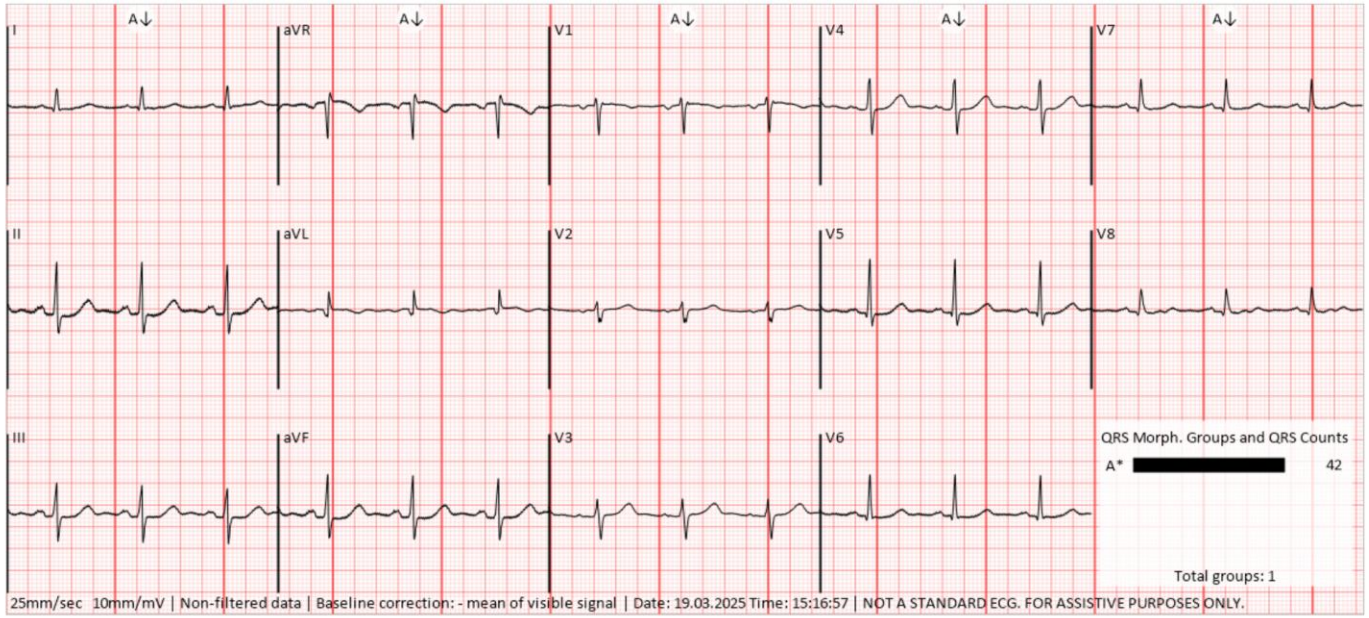


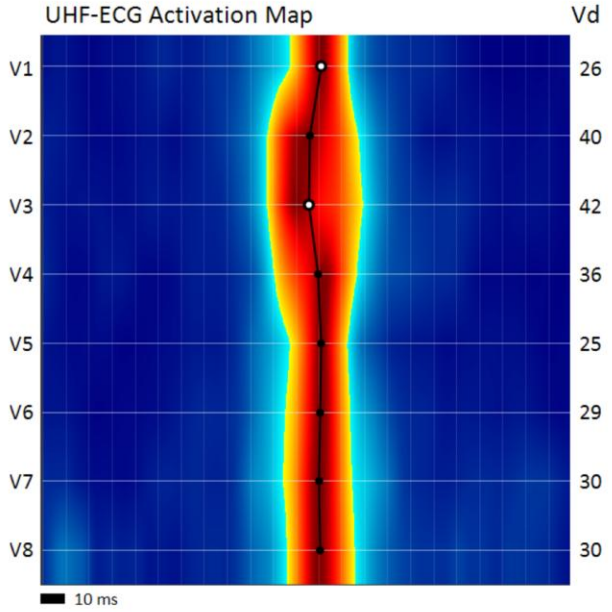
Normal

spontaneous activation, VD 33 ms



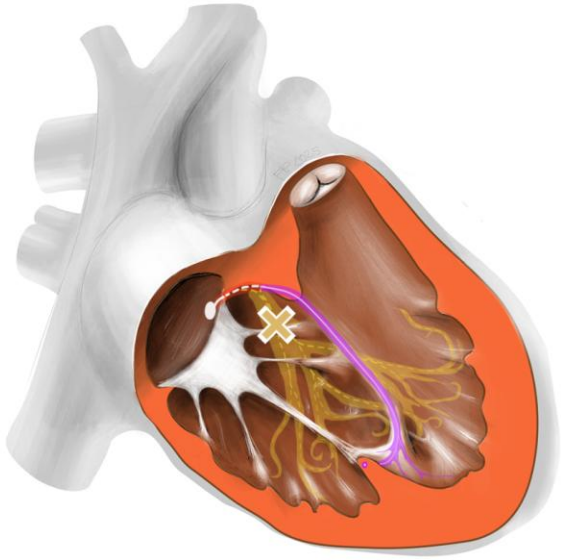


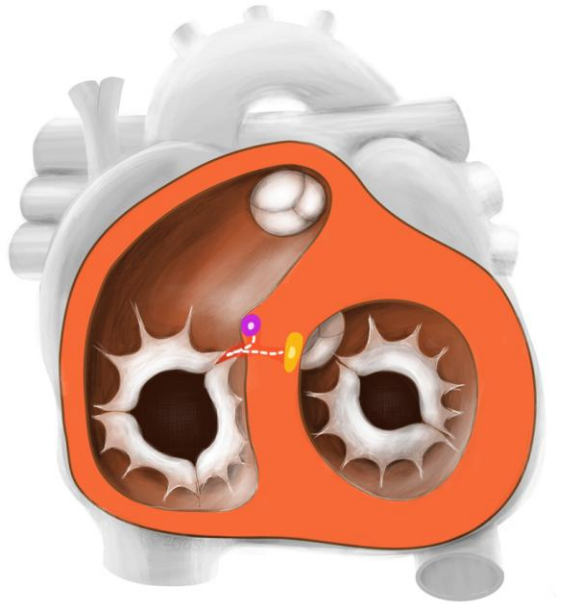




Collection 1: Spontaneous Activation Examples (2/7)

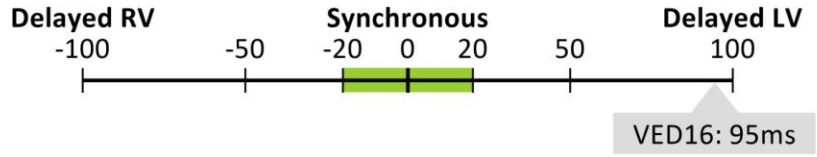
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

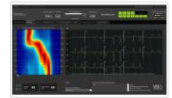


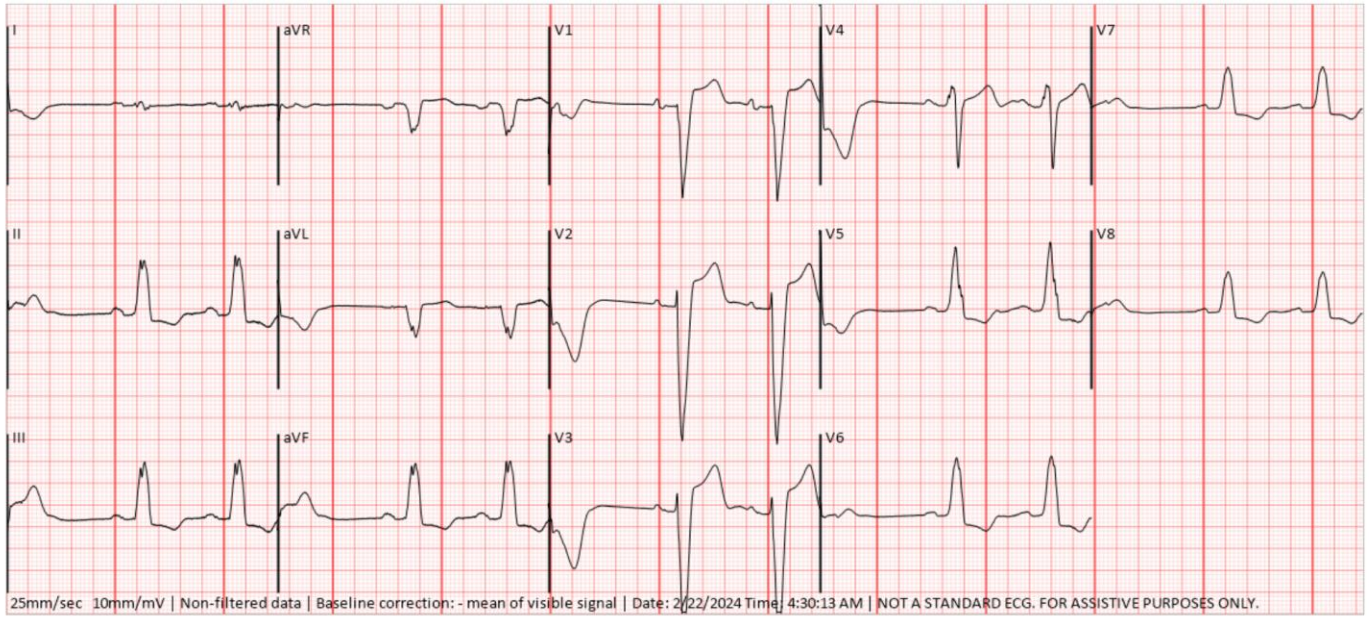


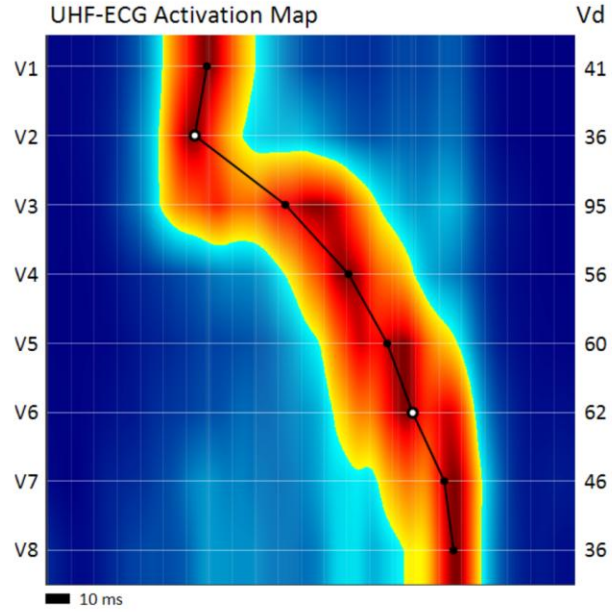
LBBB_1

Left Bundle Branch Block, VD 58 ms



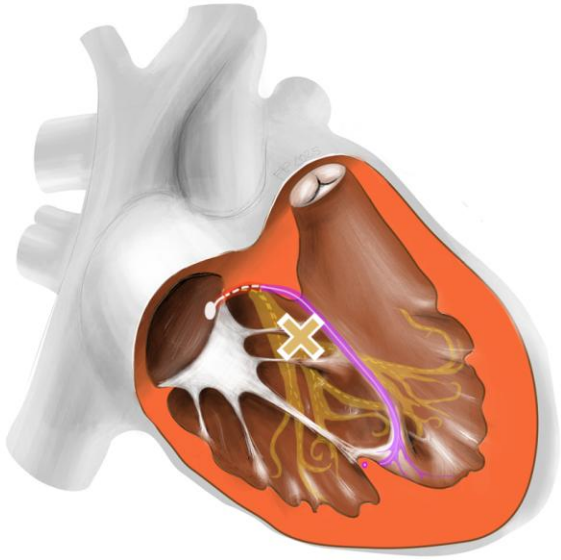


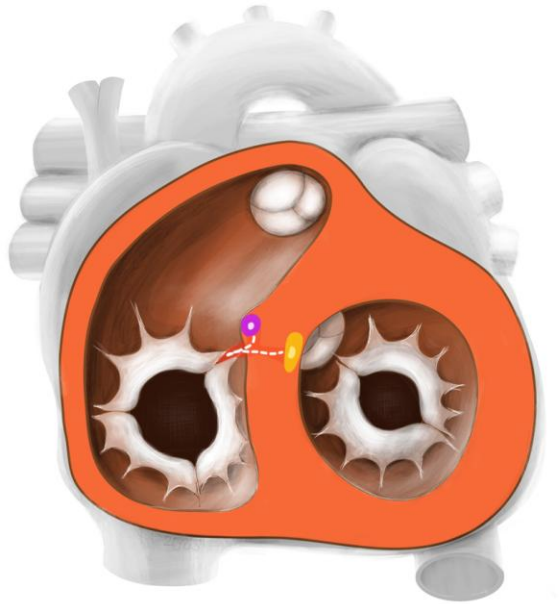




Collection 1: Spontaneous Activation Examples (3/7)

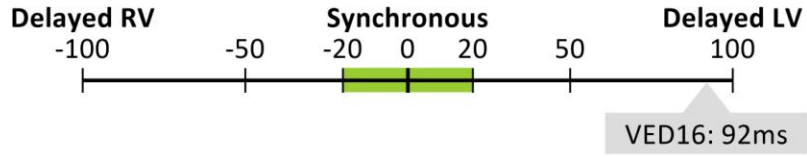
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

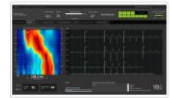


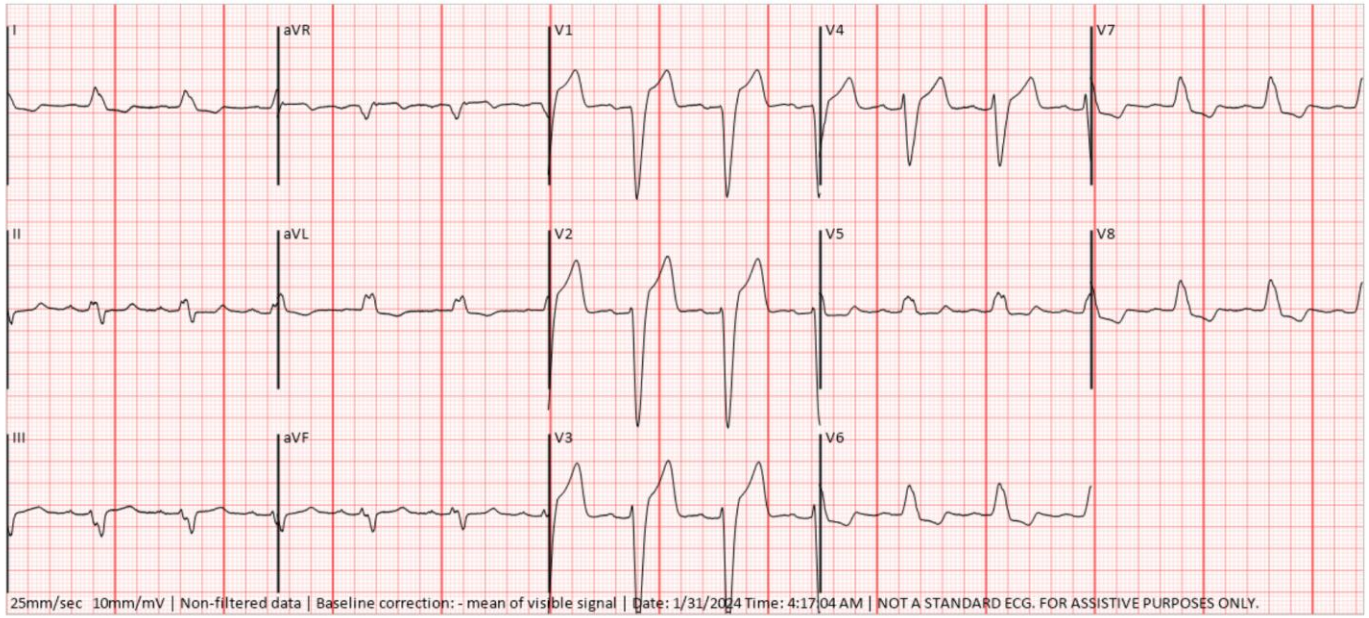


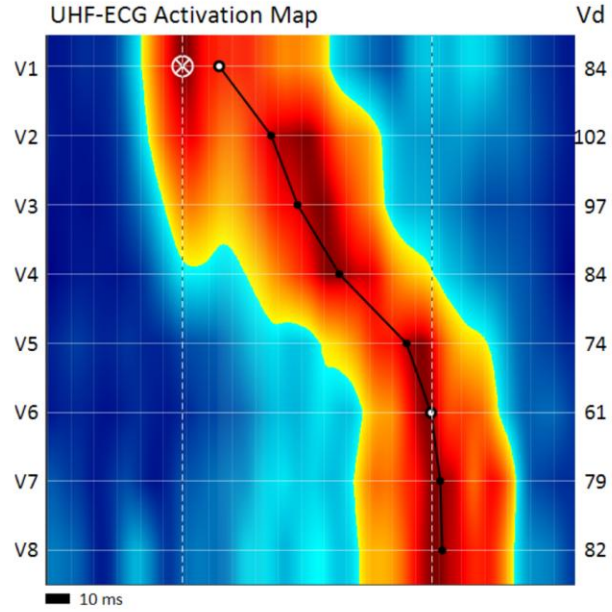
LBBB_2

Left Bundle Branch Block, VD 83 ms



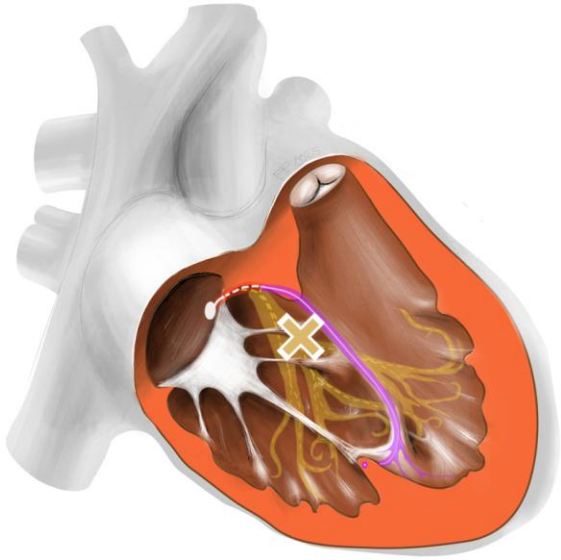


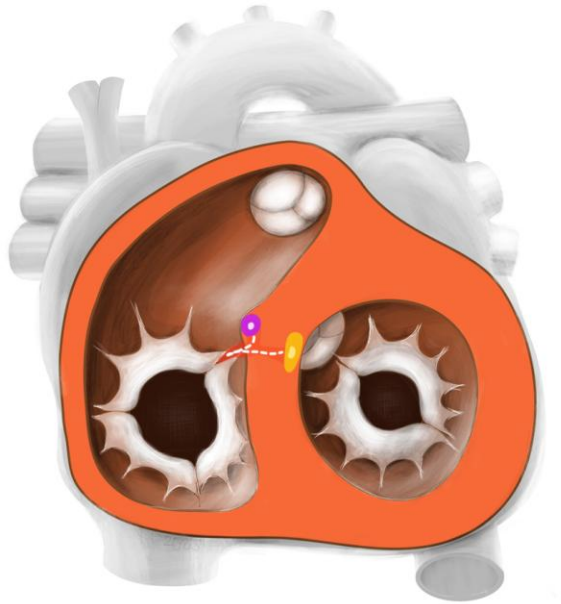




Collection 1: Spontaneous Activation Examples (4/7)

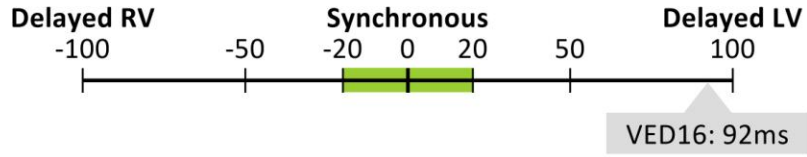
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

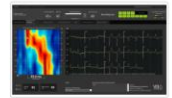


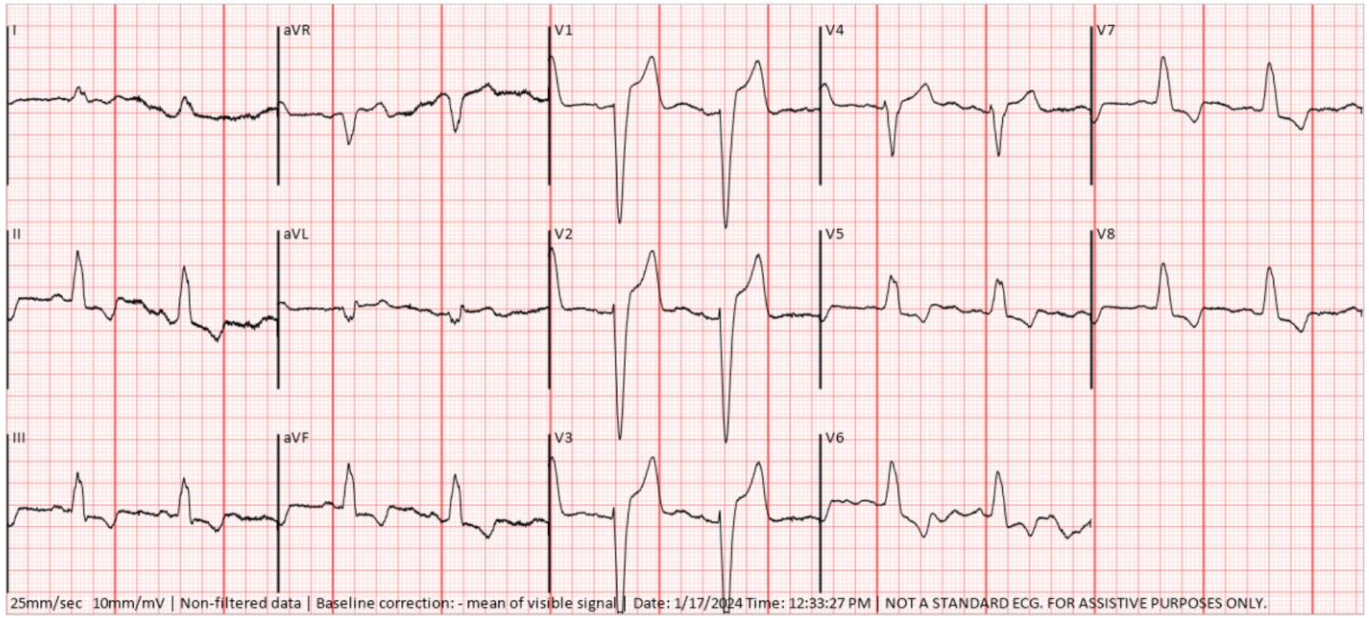


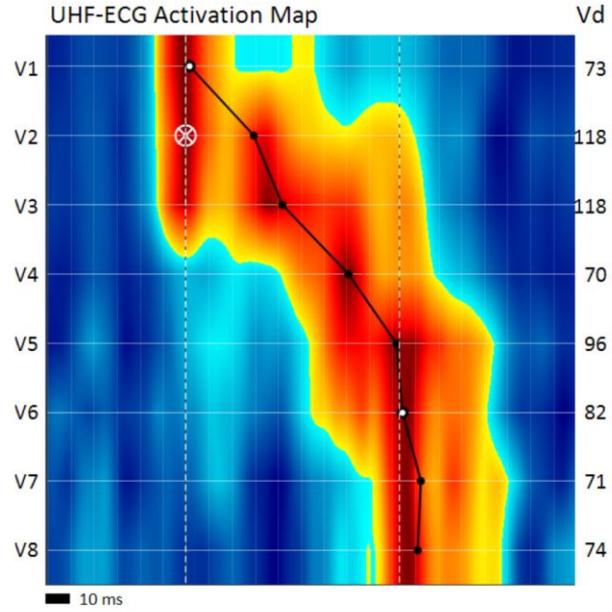
LBBB_3

Left Bundle Branch Block, VD 92 ms



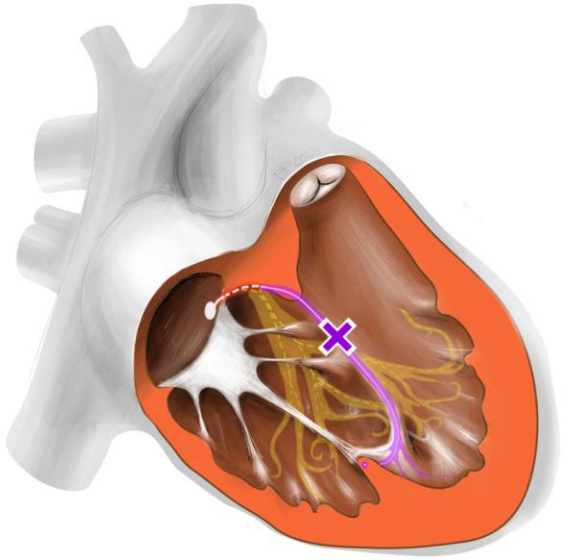


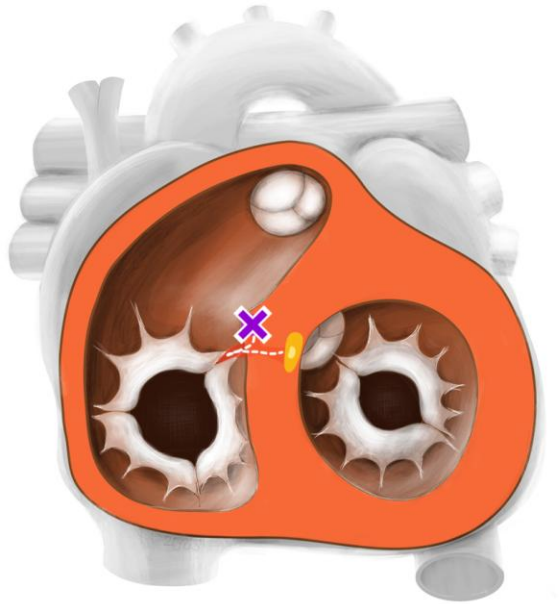




Collection 1: Spontaneous Activation Examples (5/7)

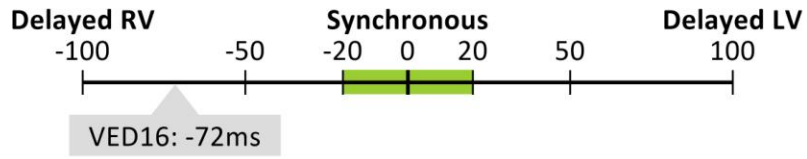
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

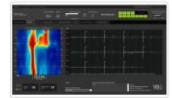


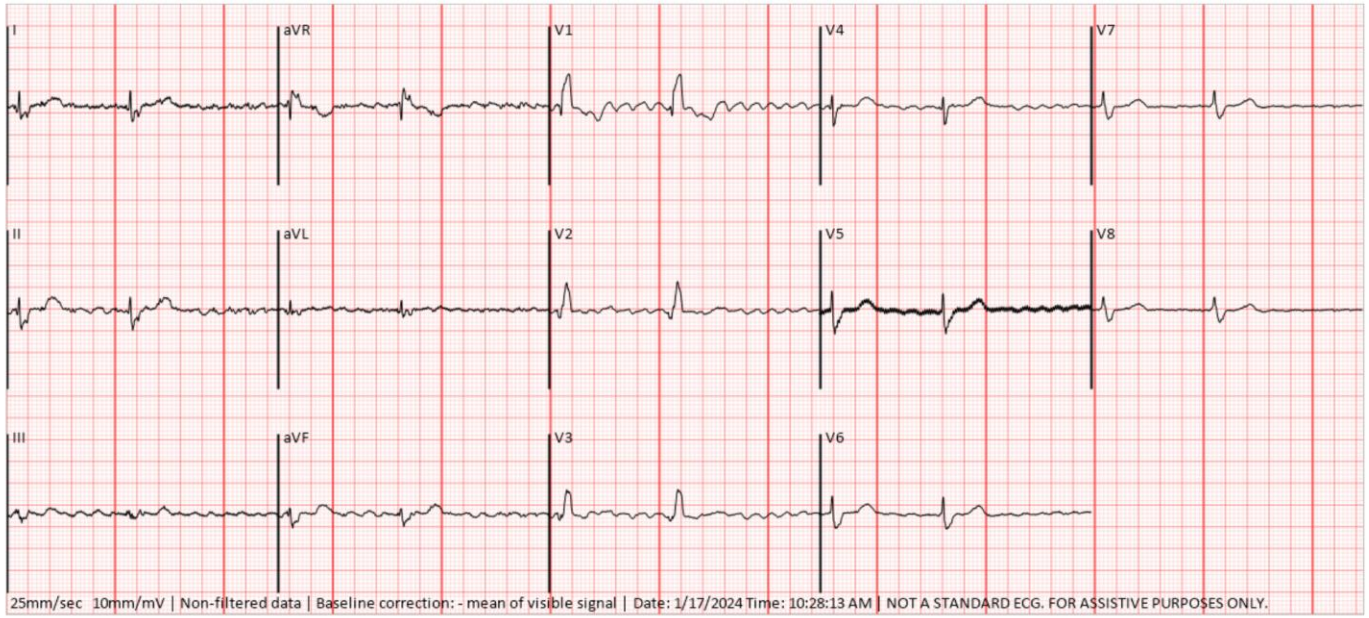


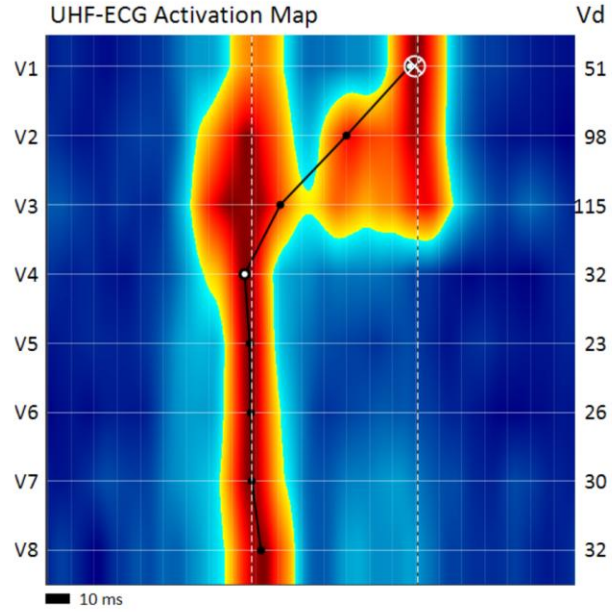
RBBB_1

Right Bundle Branch Block, VD 57 ms



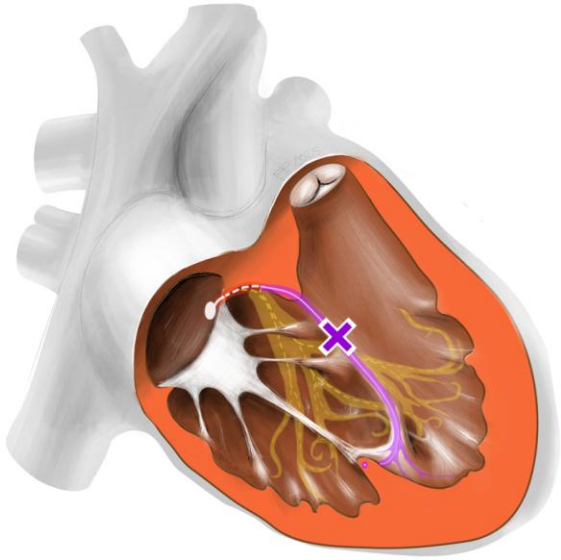


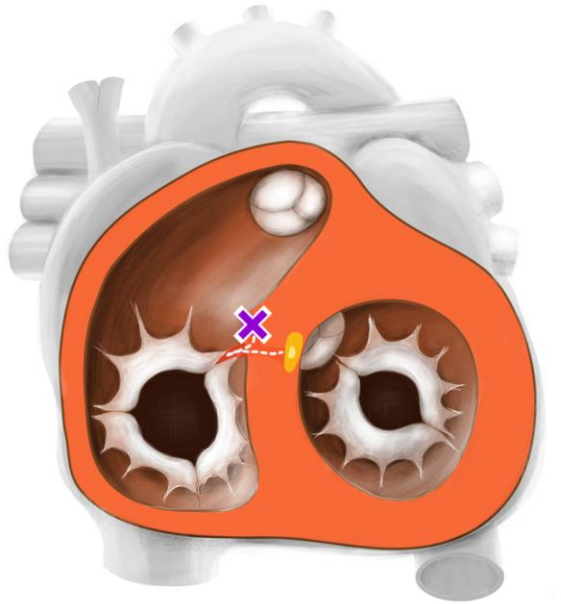




Collection 1: Spontaneous Activation Examples (6/7)

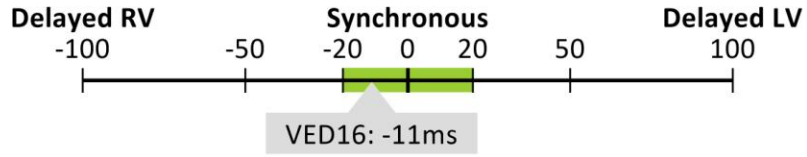
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

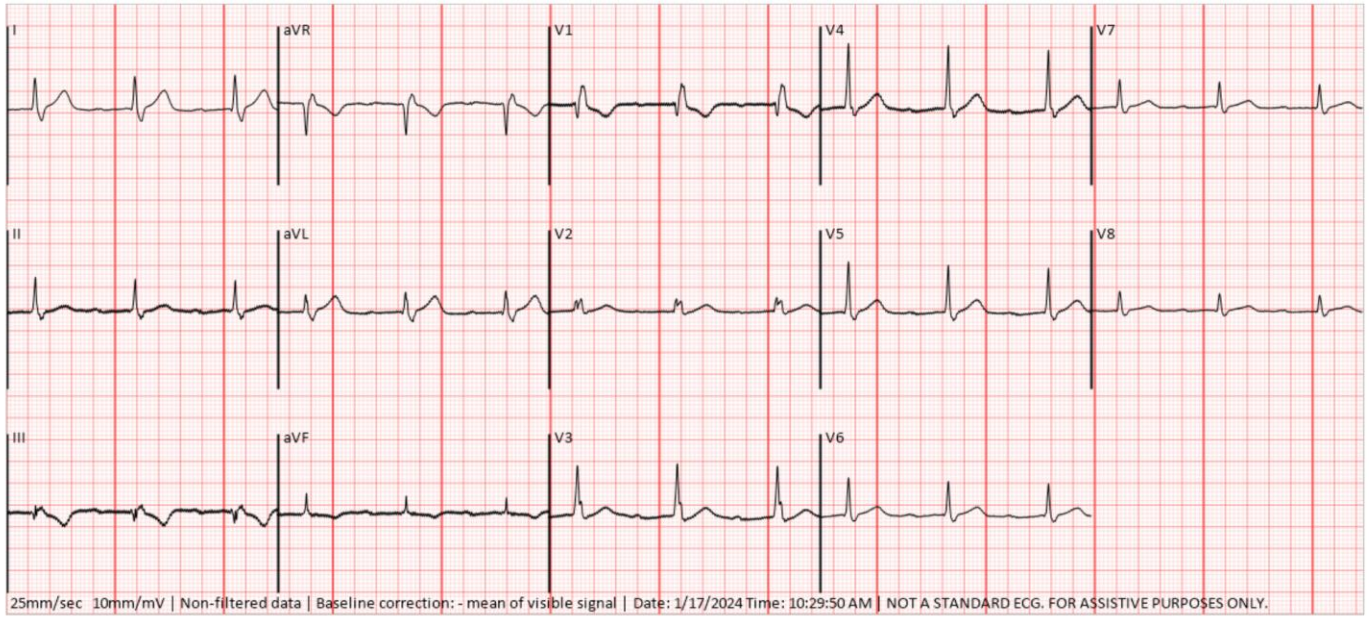


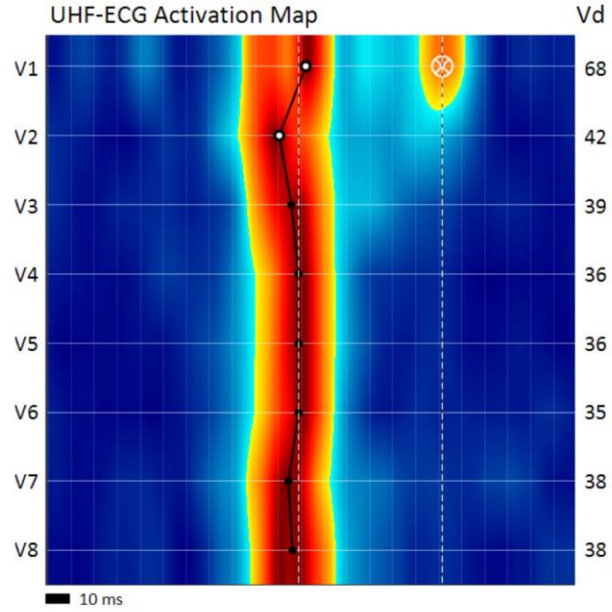


RBBB_2

Right Bundle Branch Block, VD 43 ms

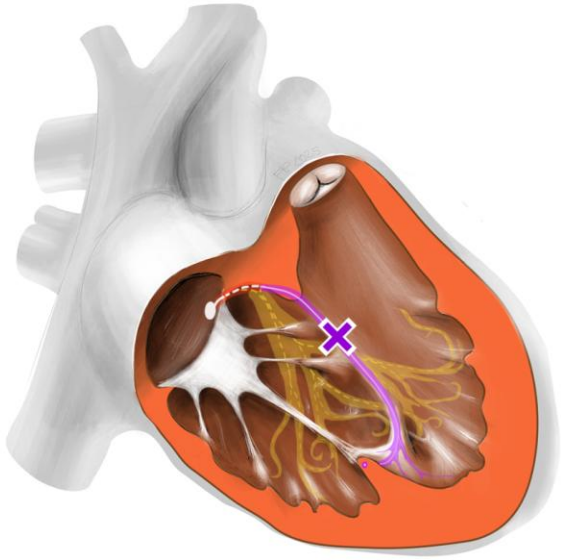


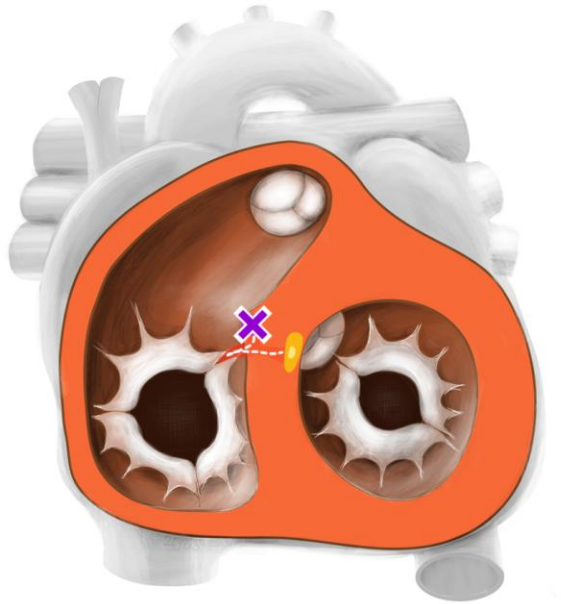




Collection 1: Spontaneous Activation Examples (7/7)

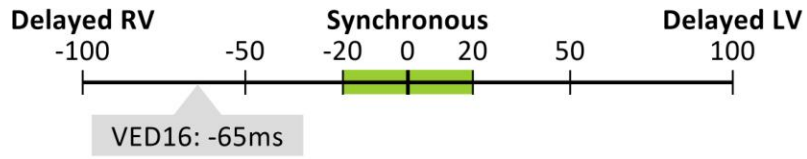
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

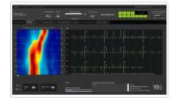


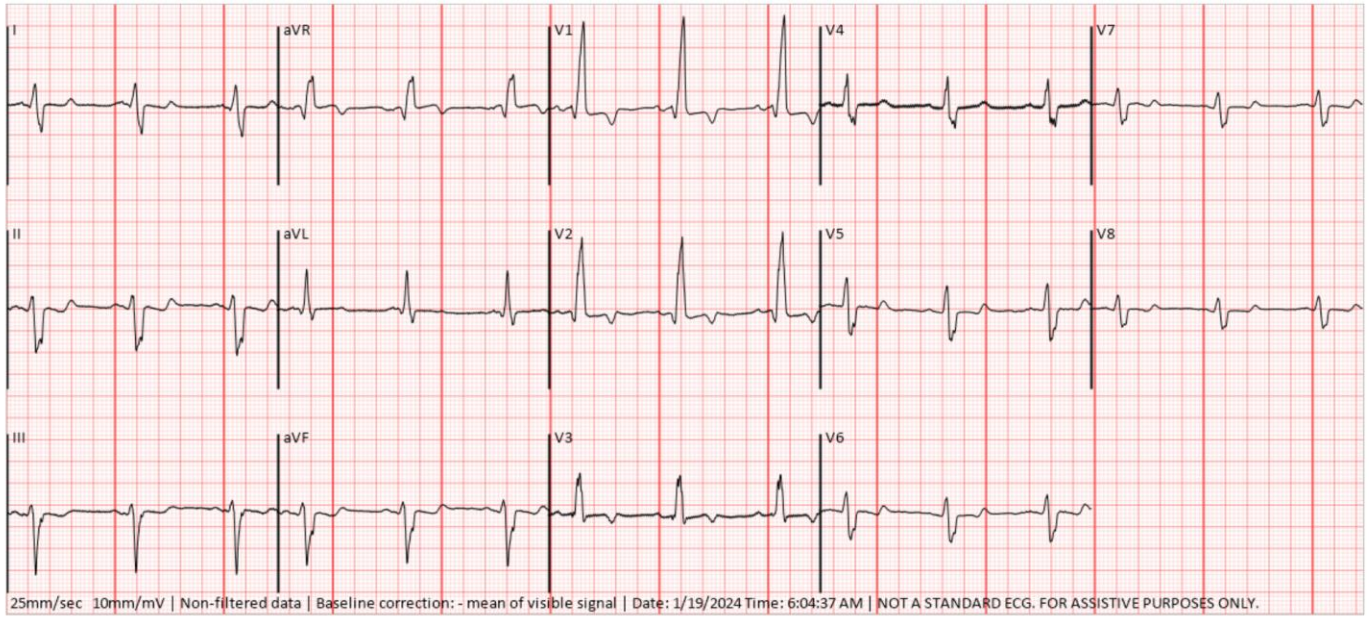


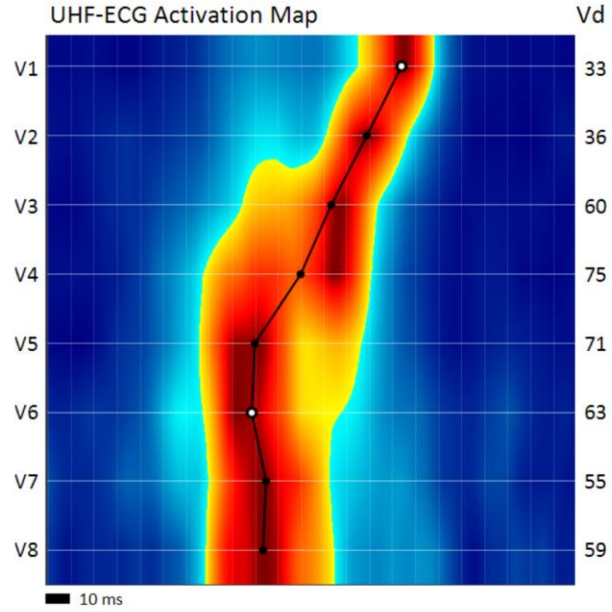
RBBB_3

Right Bundle Branch Block, VD 56 ms









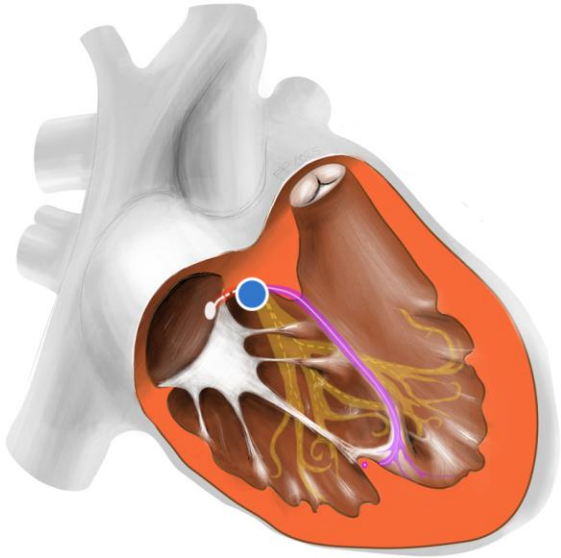
Collection 2

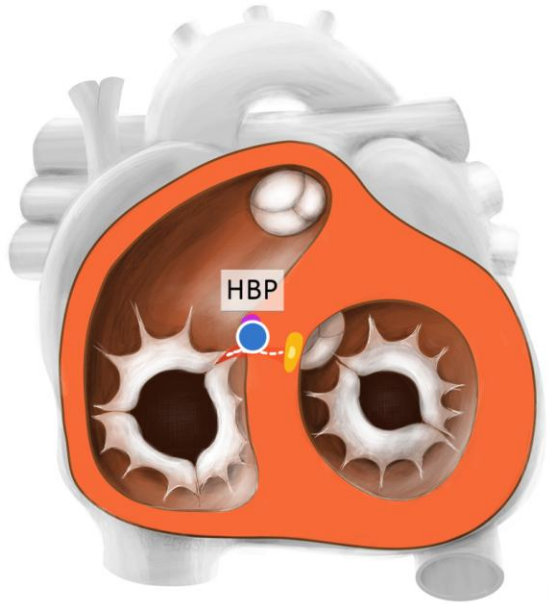
Conduction System Pacing and Right Ventricular Pacing

Examples

Collection 2: Conduction System Pacing and Right Ventricular Pacing (1/6)

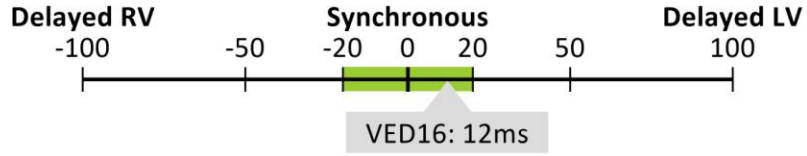
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

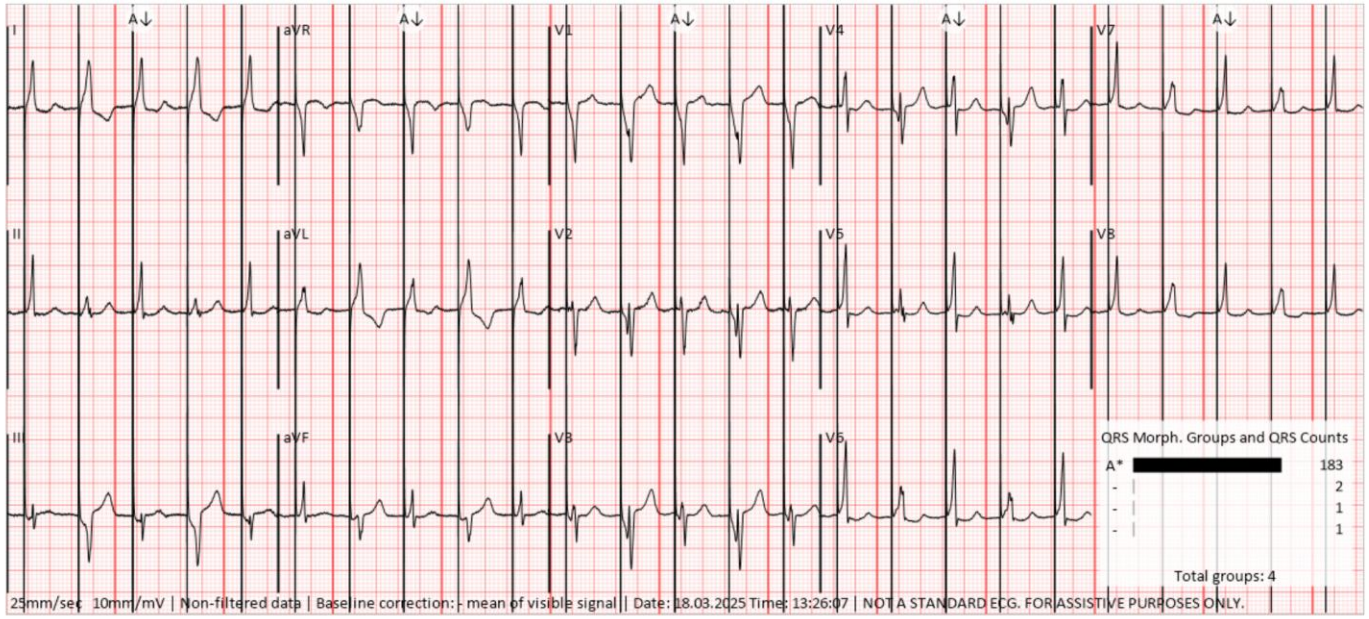


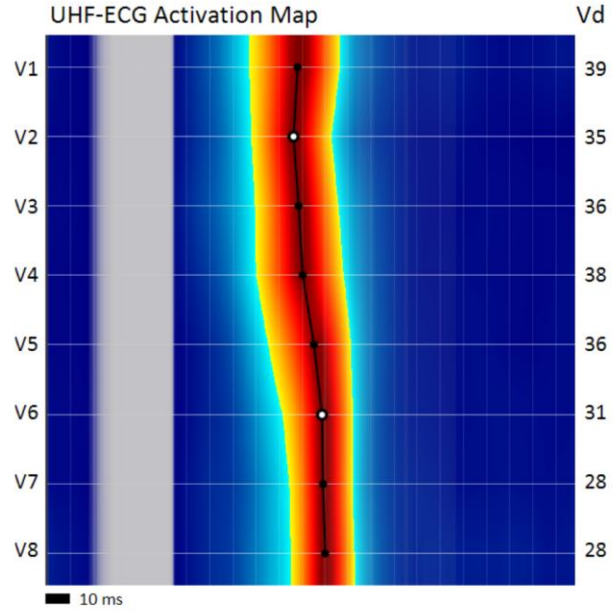


HBP

His Bundle Pacing, VD 36 ms

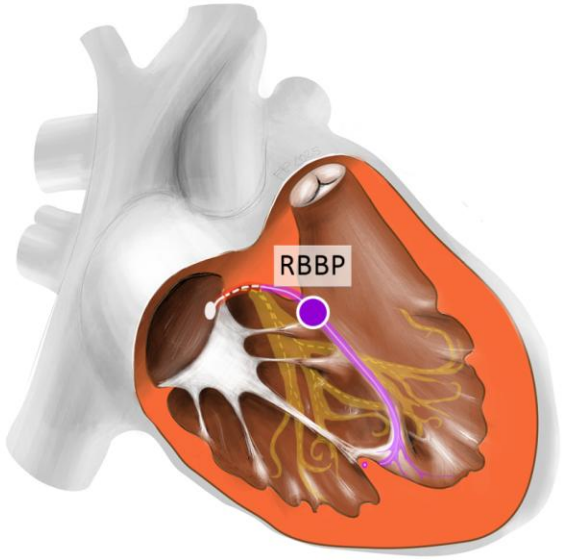


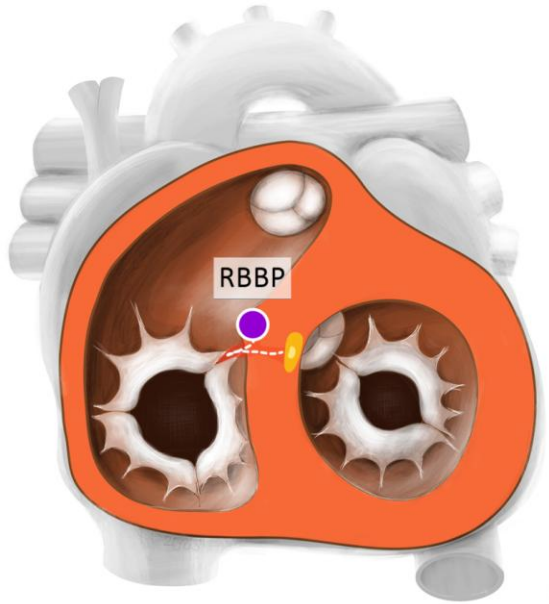




Collection 2: Conduction System Pacing and Right Ventricular Pacing (2/6)

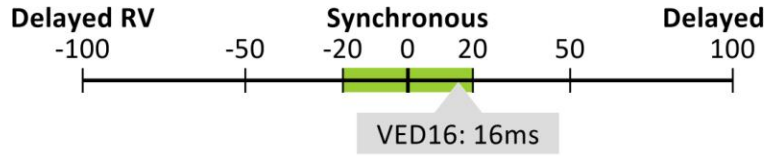
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

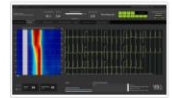


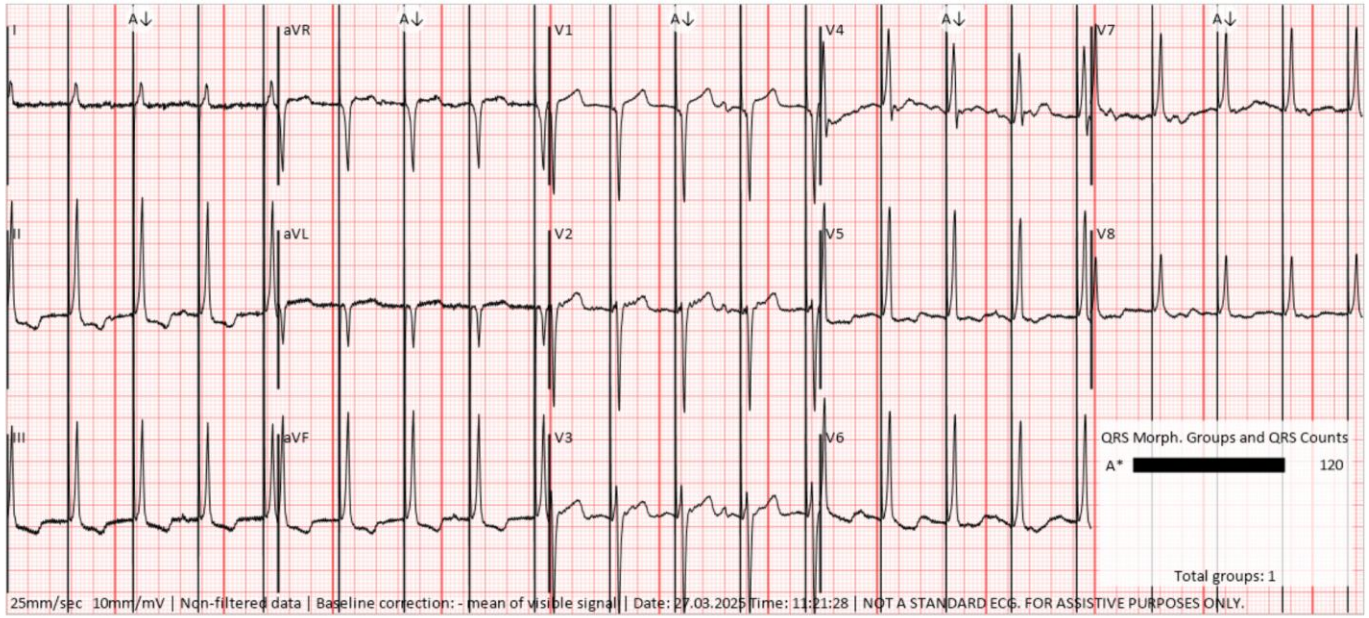


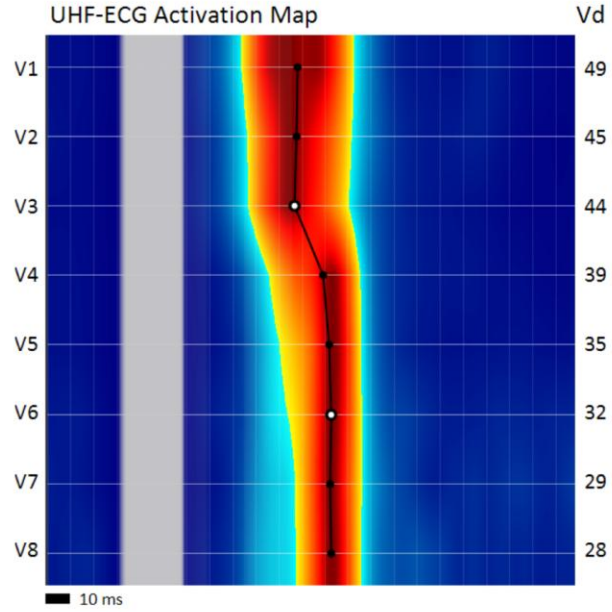
RBBP

Right Bundle Branch Pacing, VD 41 ms



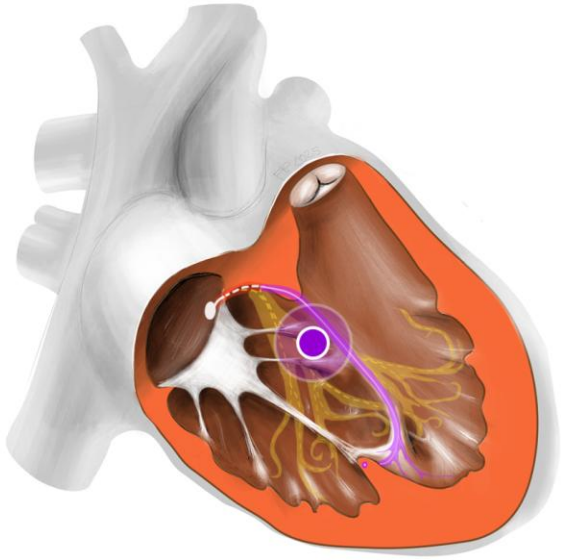


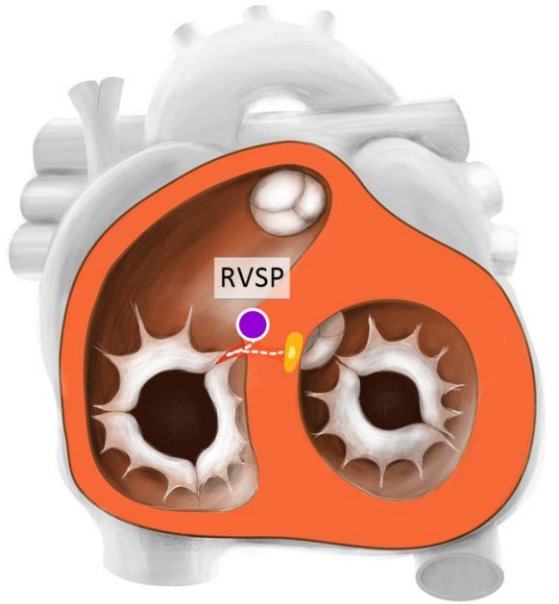




Collection 2: Conduction System Pacing and Right Ventricular Pacing (3/6)

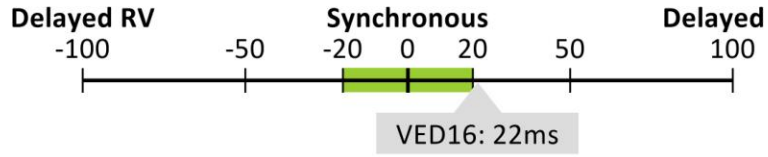
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

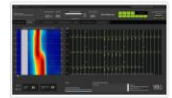


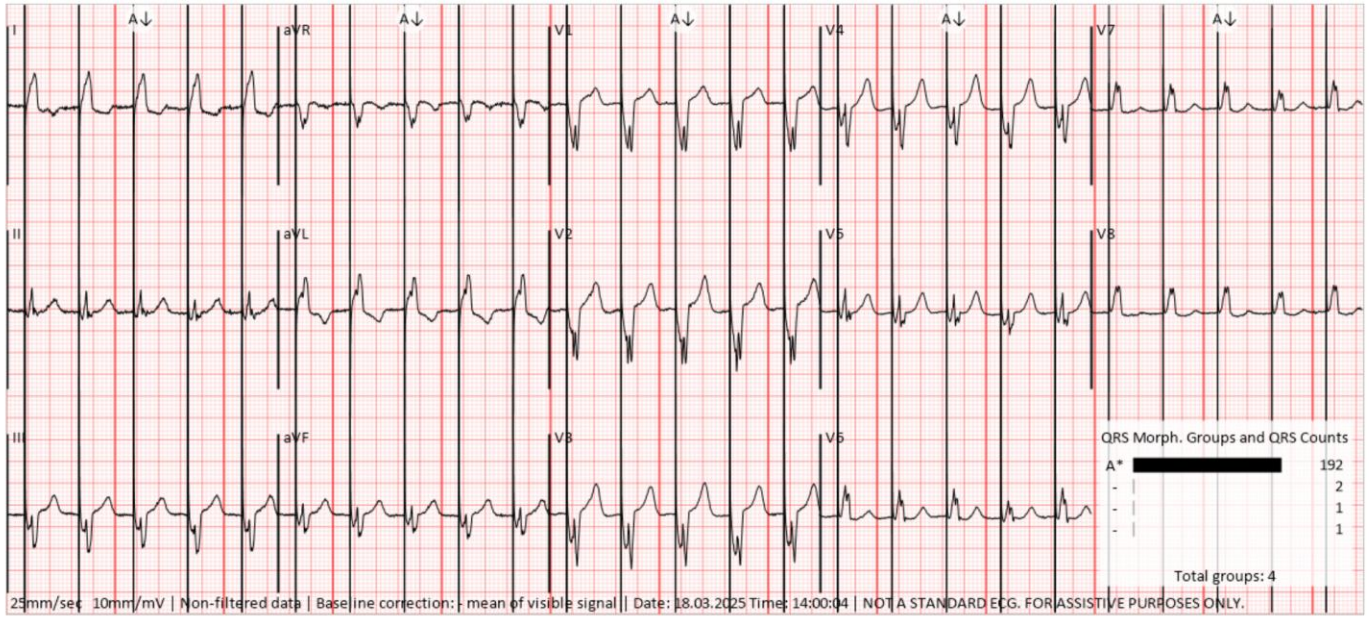


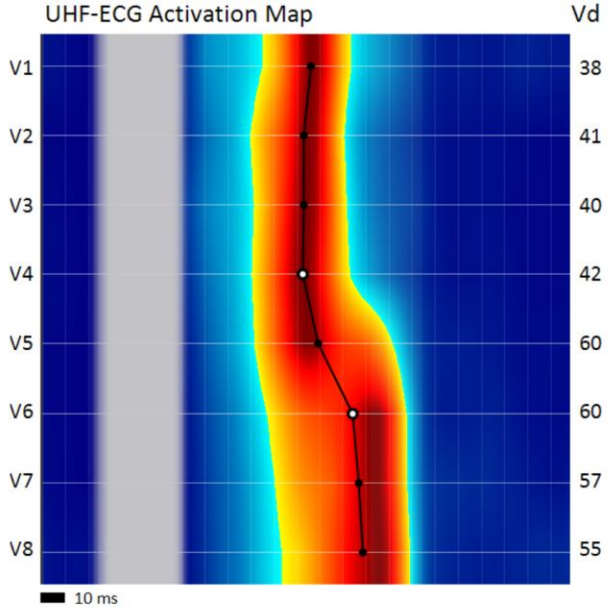
RVSP

Right Ventricular Septal Pacing, VD 47 ms



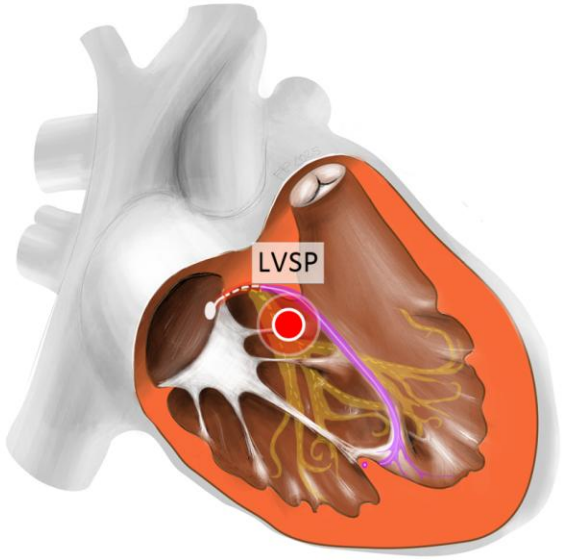


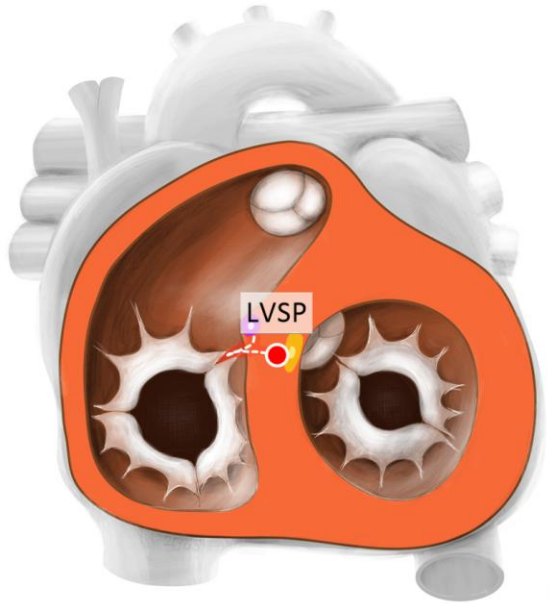




Collection 2: Conduction System Pacing and Right Ventricular Pacing (4/6)

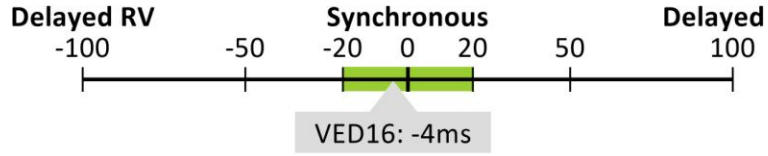
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

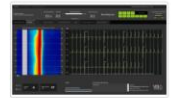


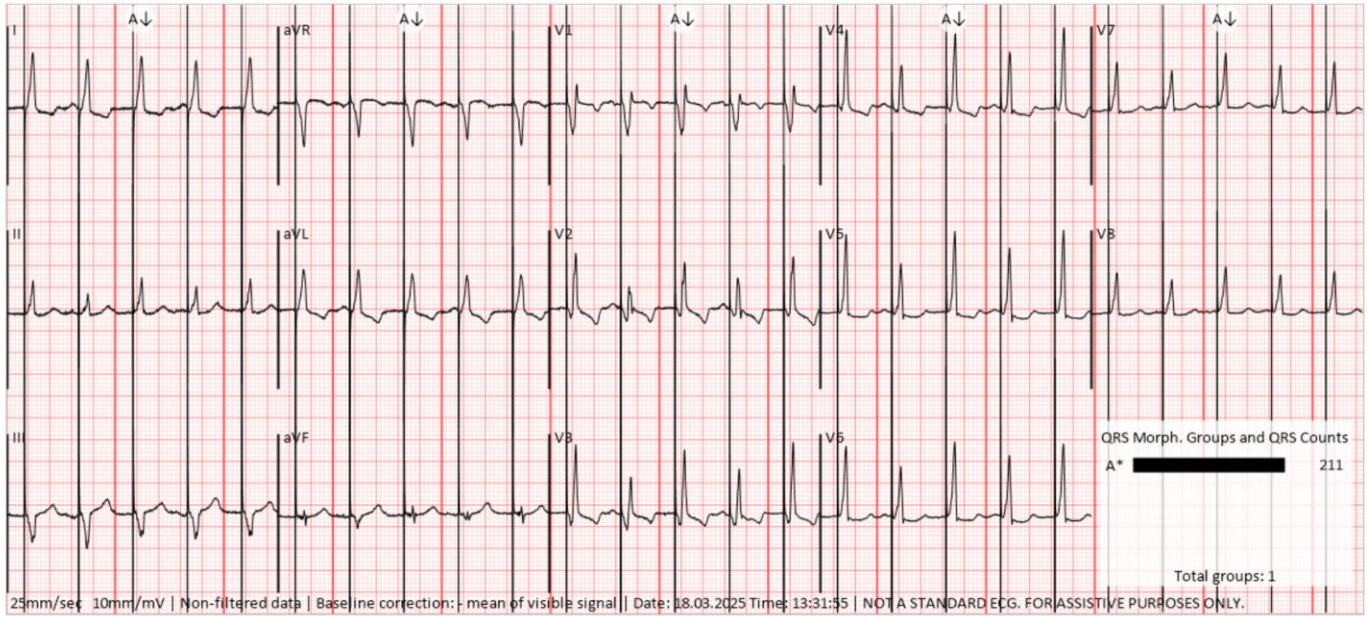


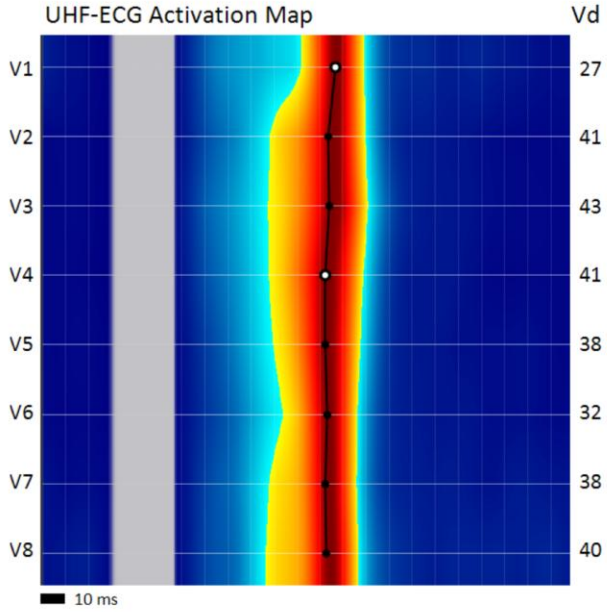
LVSP

Left Ventricular Septal Pacing, VD 37 ms



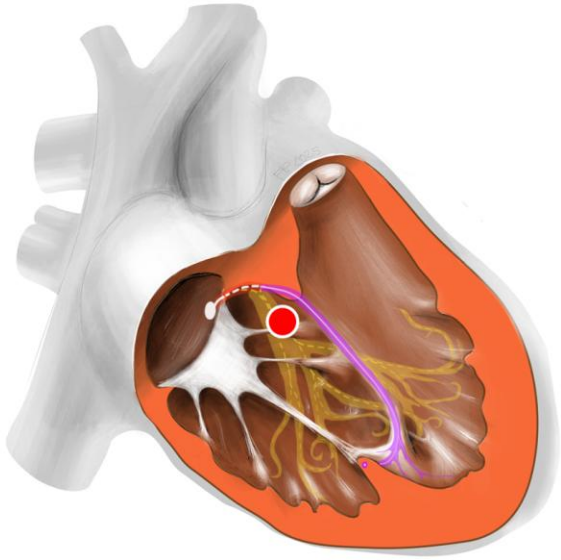


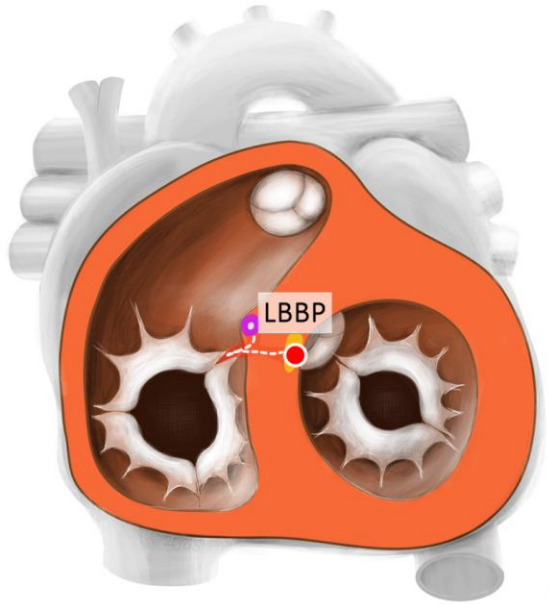




Collection 2: Conduction System Pacing and Right Ventricular Pacing (5/6)

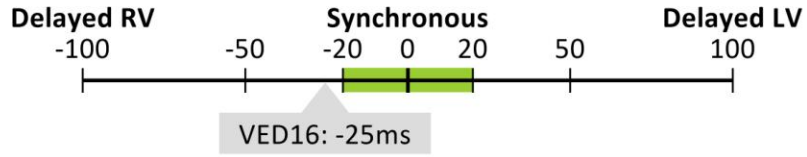
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

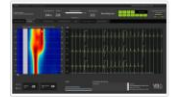


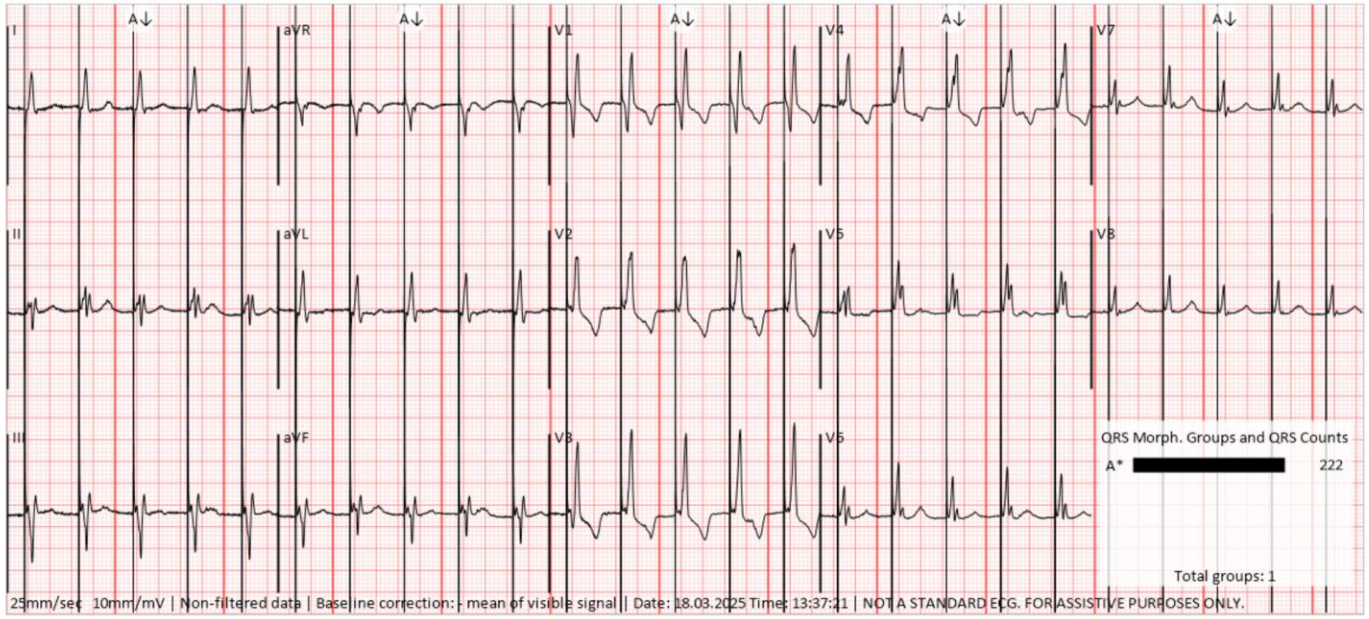


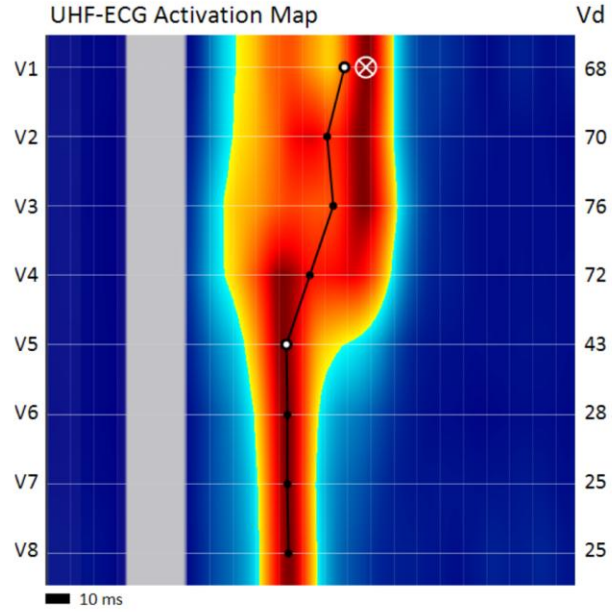
nsLBBP

Left Bundle Branch Pacing, VD 59 ms



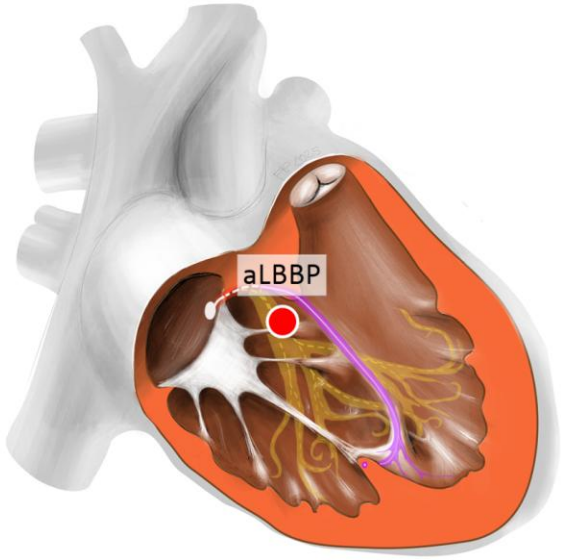


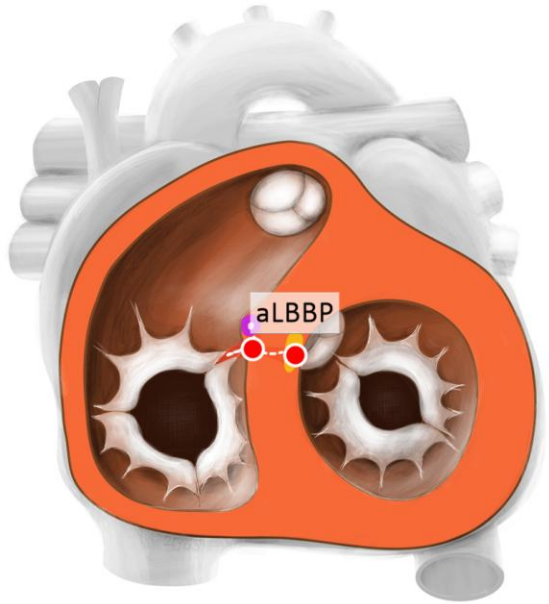




Collection 2: Conduction System Pacing and Right Ventricular Pacing (6/6)

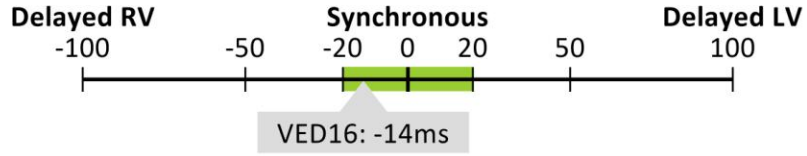
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

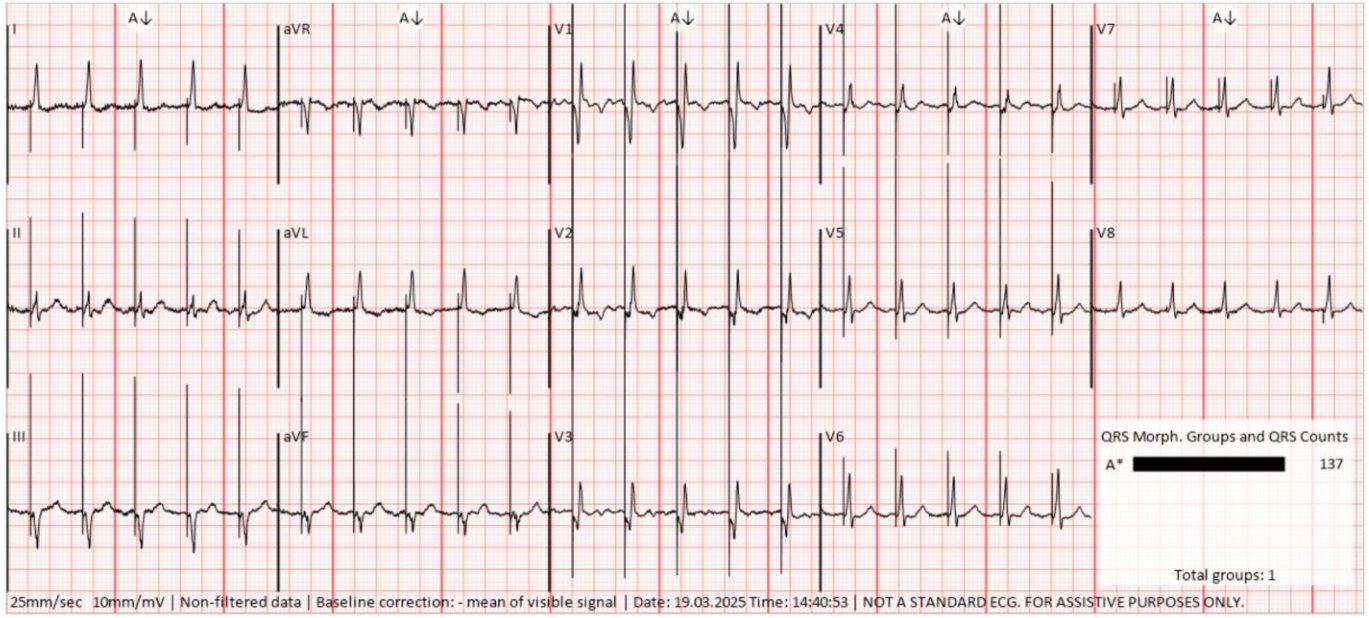


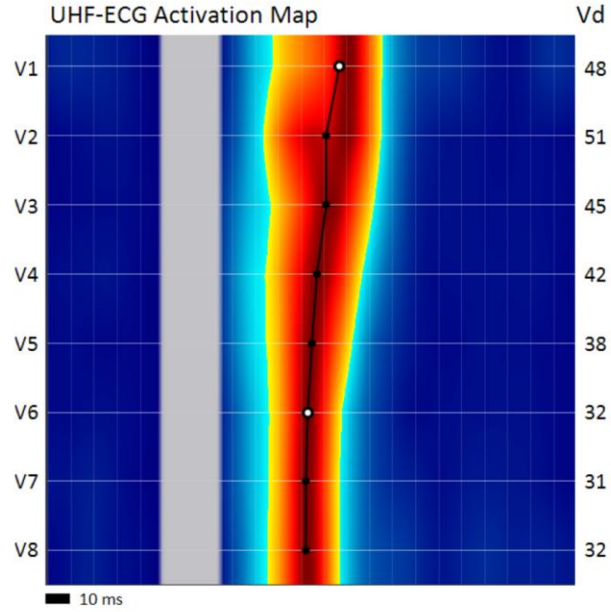


anodal LBBP

anodal Left Bundle Branch Pacing, VD 43 ms





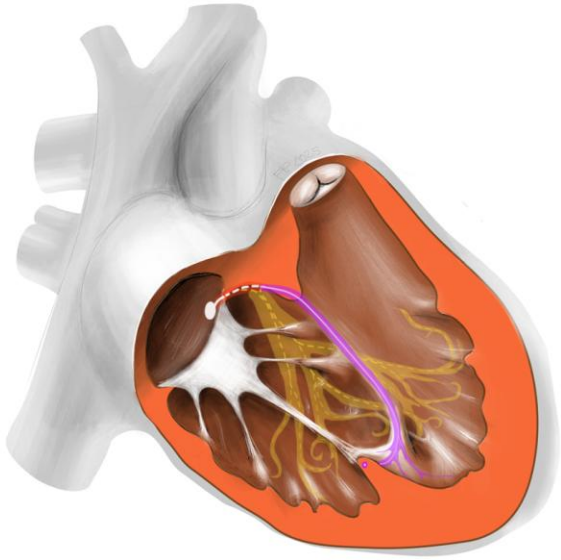


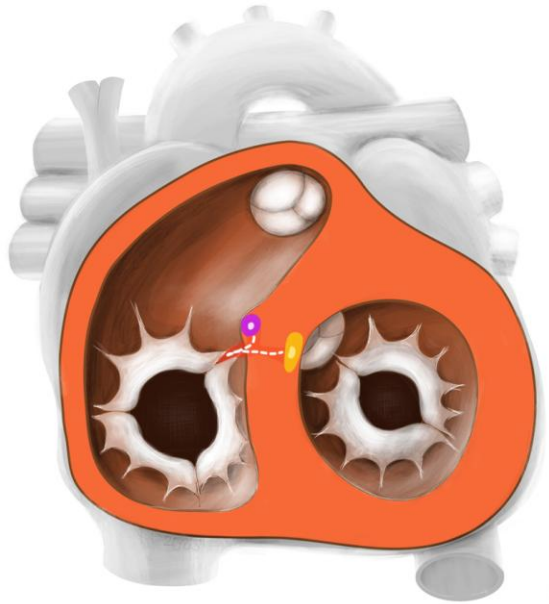
Collection 3

Activation Pattern during Septal Crossing,
Single Bradycardia Patient

Collection 3: Activation Pattern during Septal Crossing, single patient (1/5)

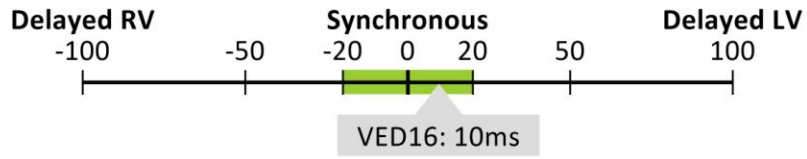
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

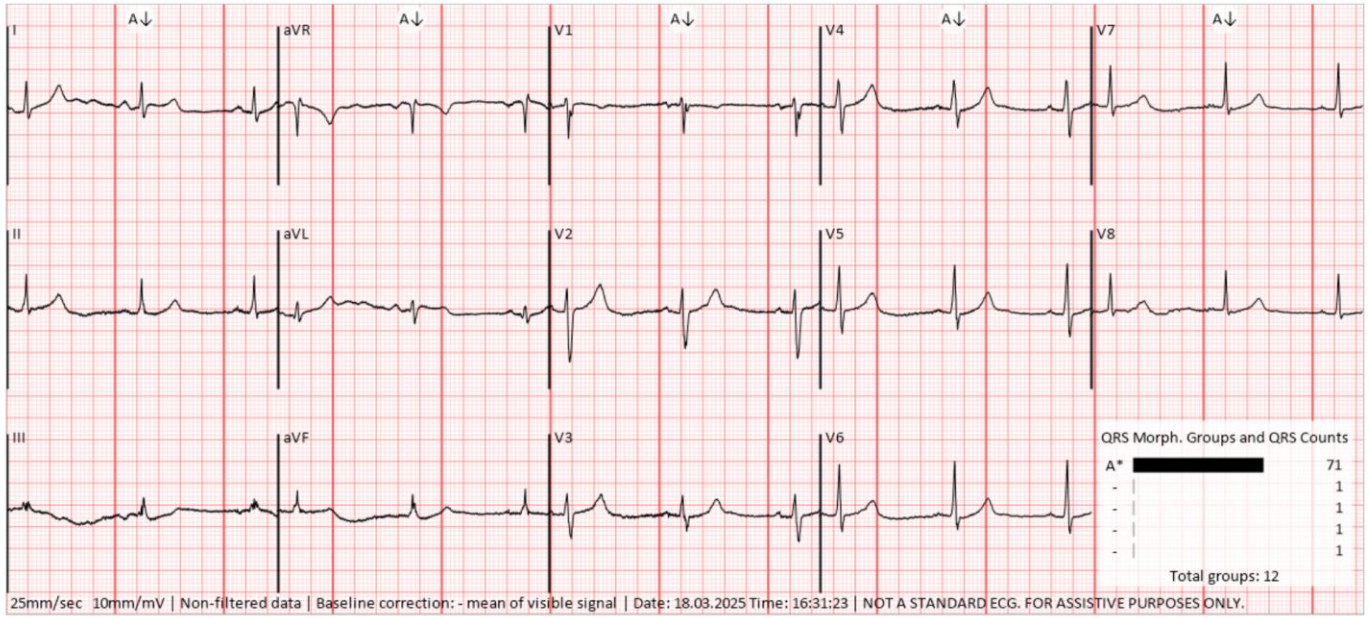


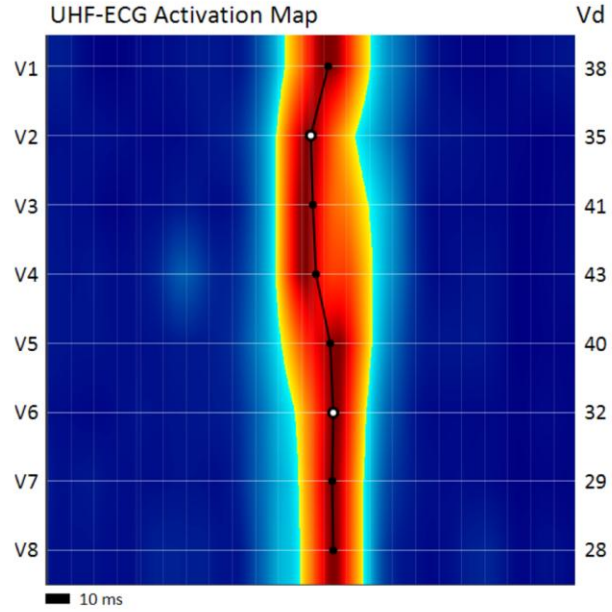


Bradycardia

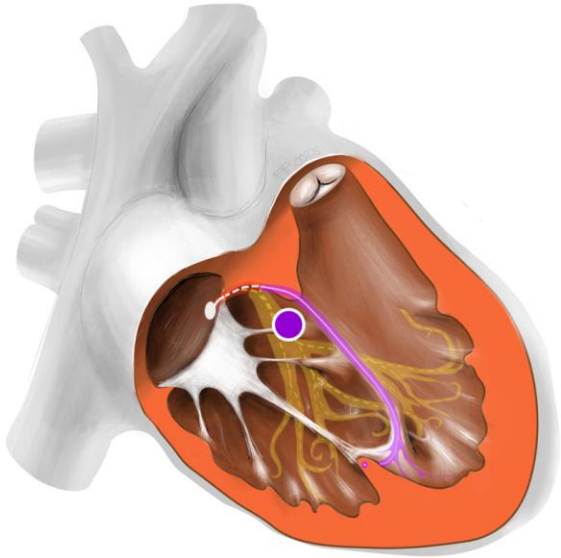
spontaneous activation, VD 38 ms

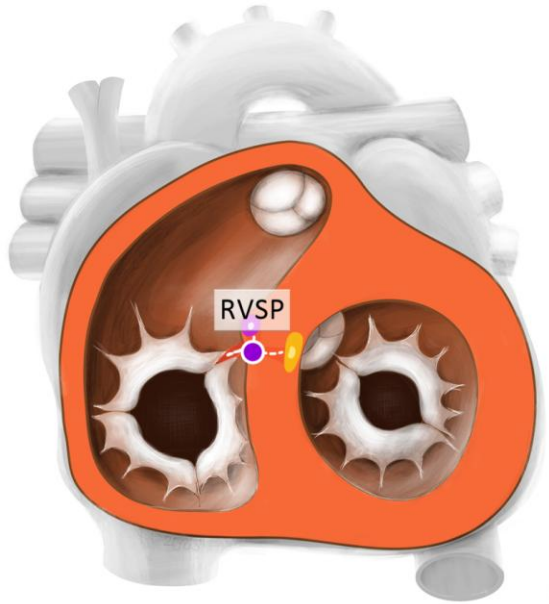






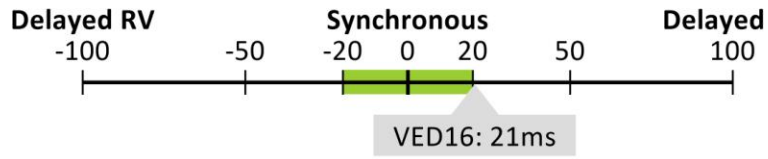
Collection 3: Activation Pattern during Septal Crossing, single patient (2/5)

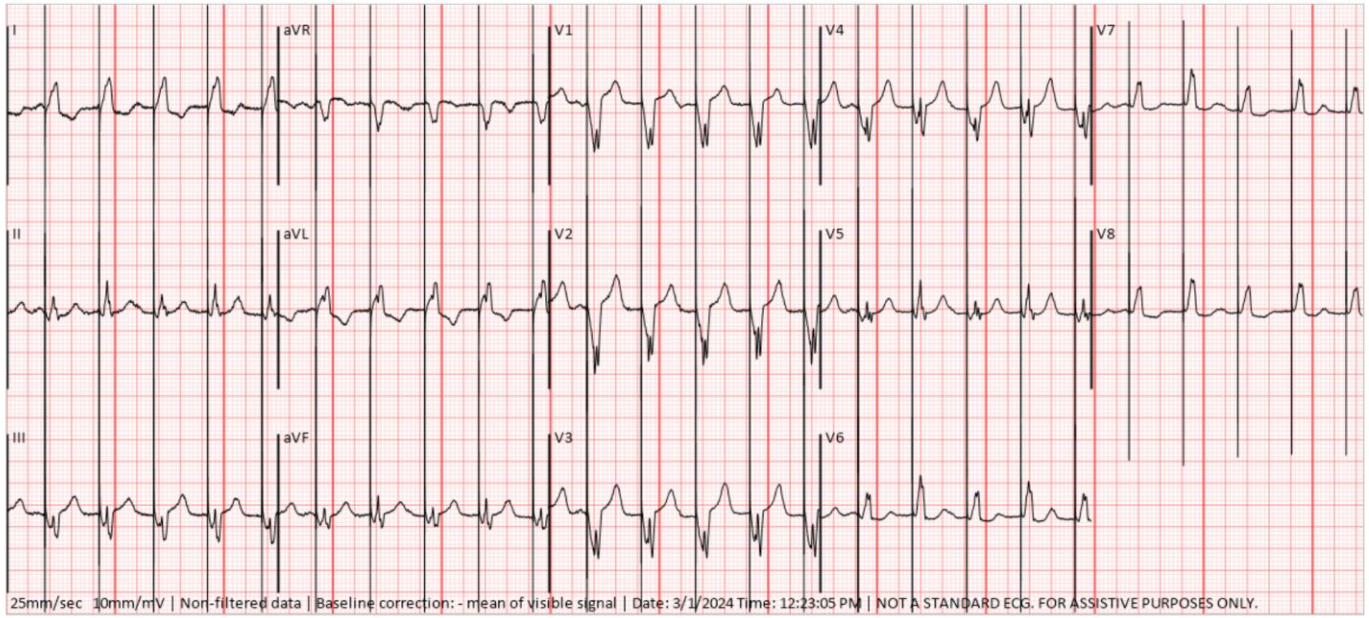


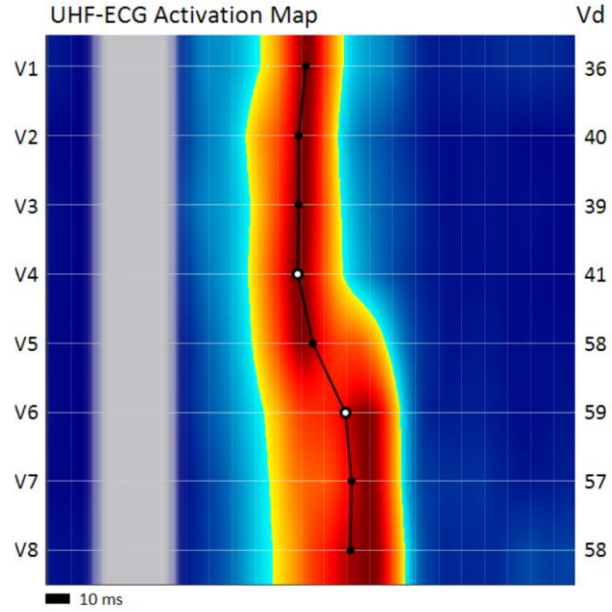


RVSP

Right Ventricular Septal Pacing, VD 46 ms

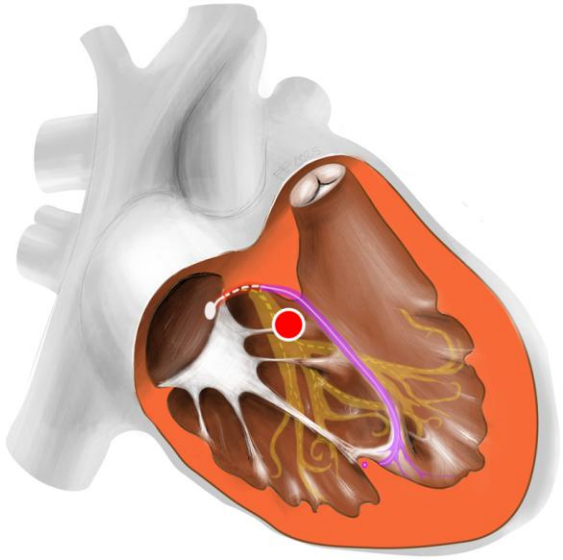


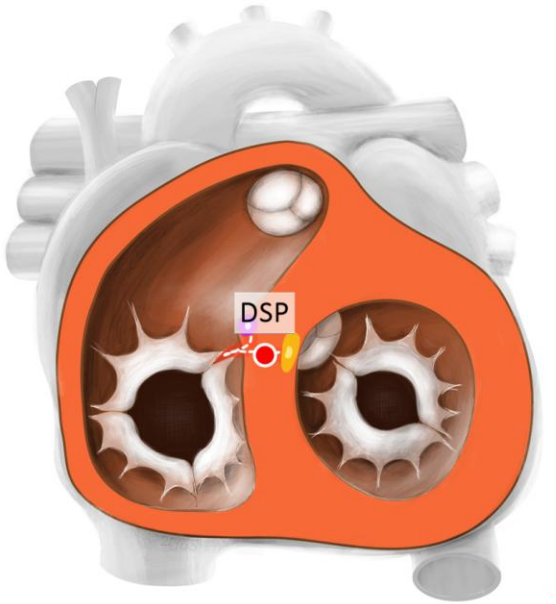




Collection 3: Activation Pattern during Septal Crossing, single patient (3/5)

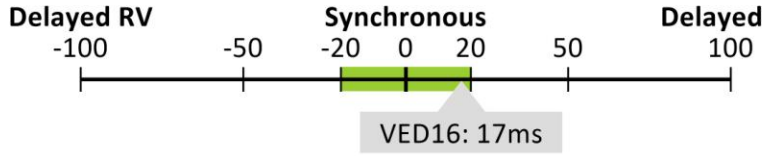
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

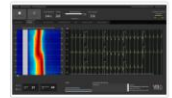


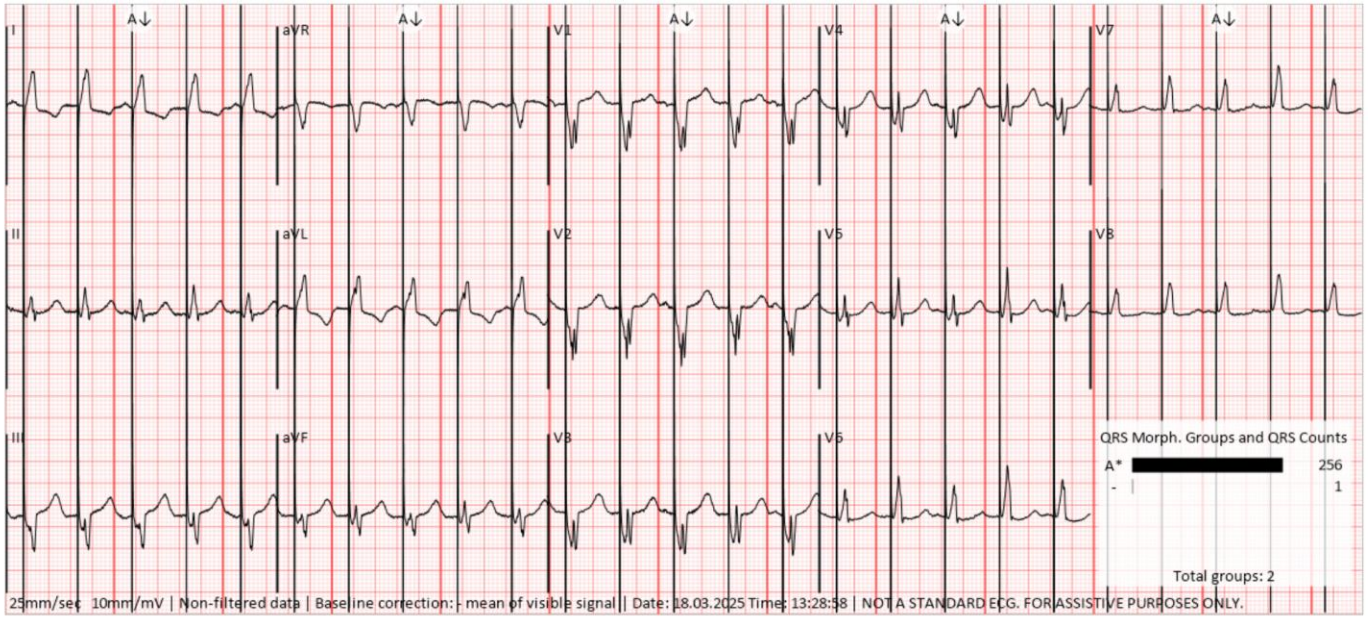


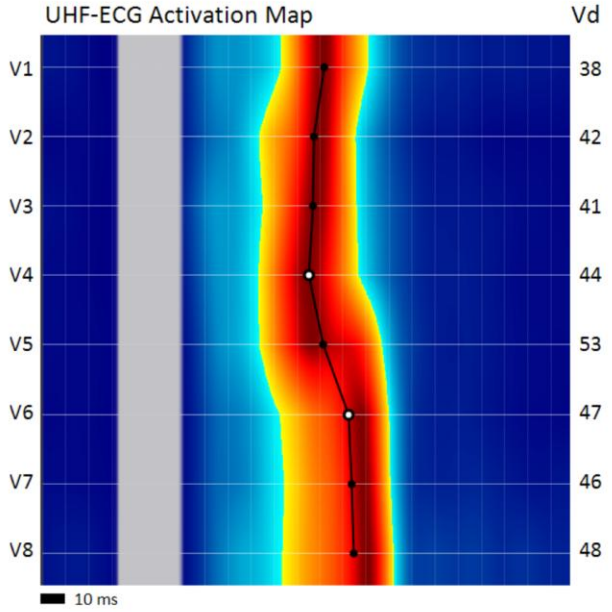
DSP

Deep Septal Pacing, VD 44 ms



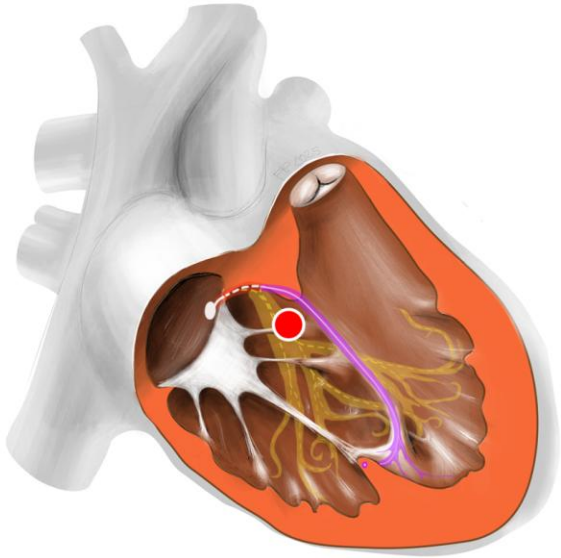


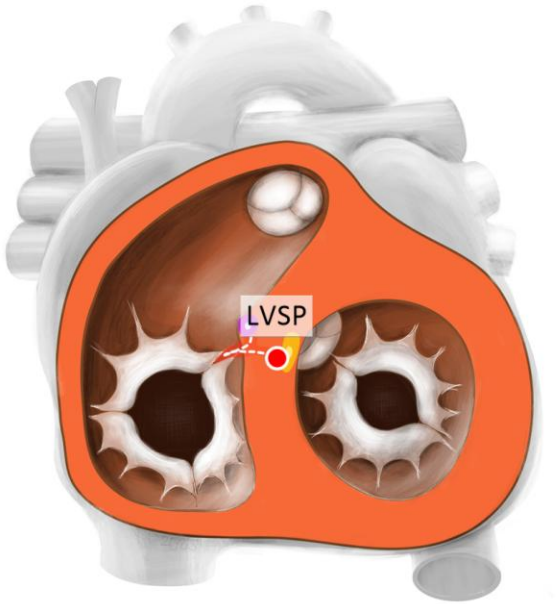




Collection 3: Activation Pattern during Septal Crossing, single patient (4/5)

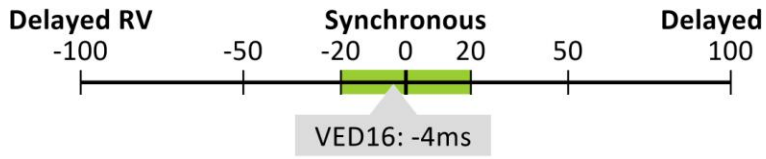
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

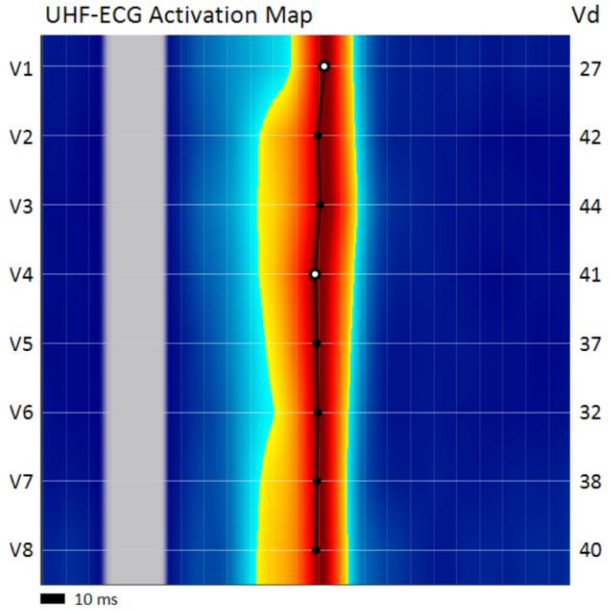




LVSP

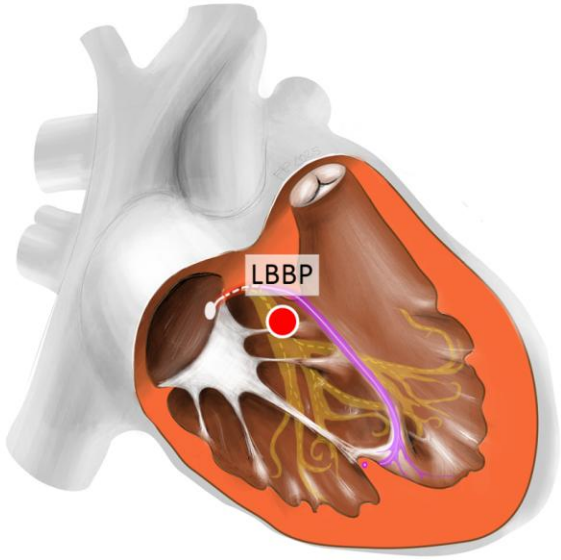
Deep Ventricular Septal Pacing, VD 37 ms

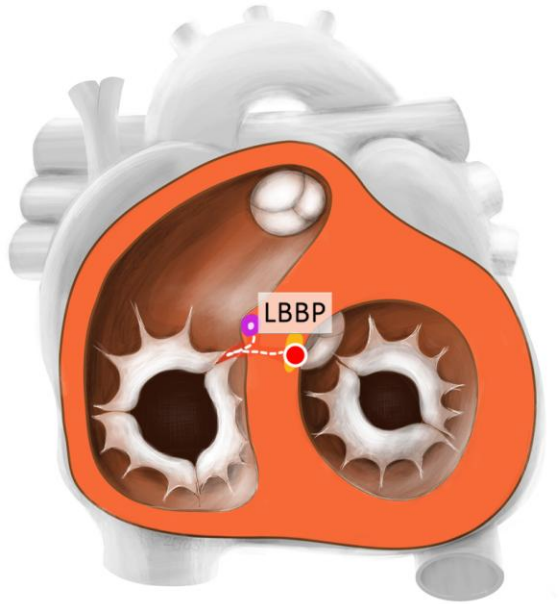




Collection 3: Activation Pattern during Septal Crossing, single patient (5/5)

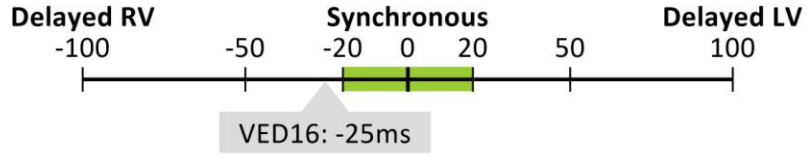
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

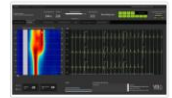


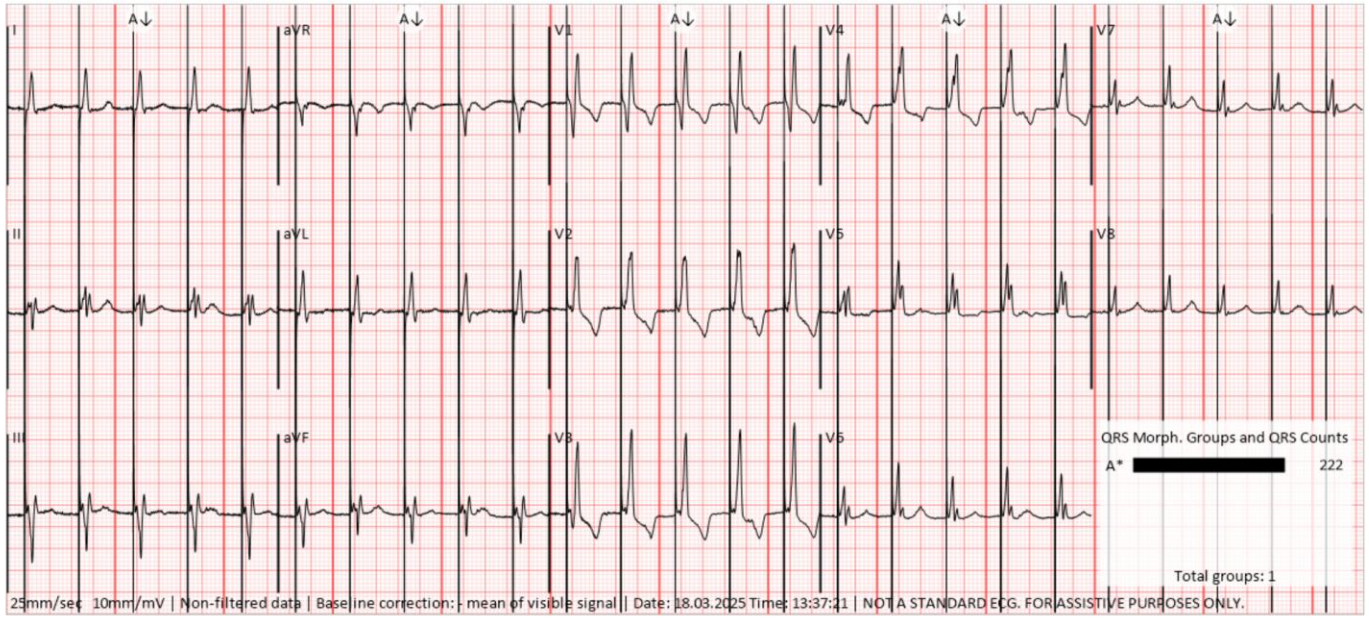


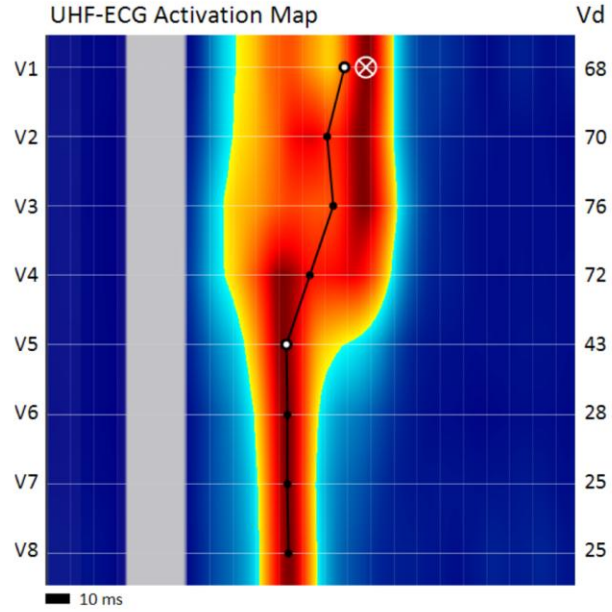
LBBP

Left Bundle Branch Pacing, VD 59 ms









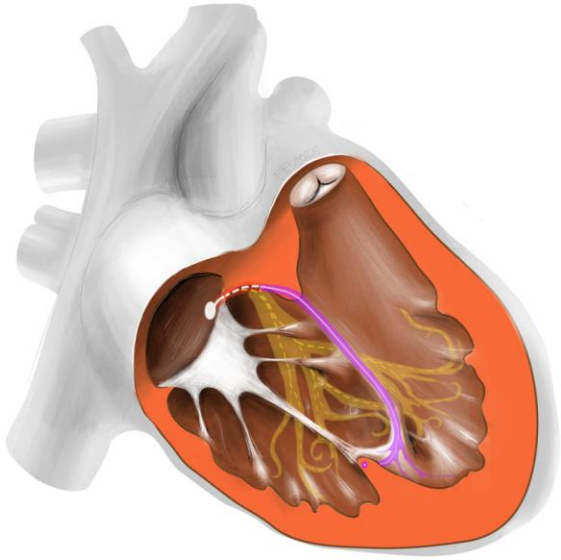
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

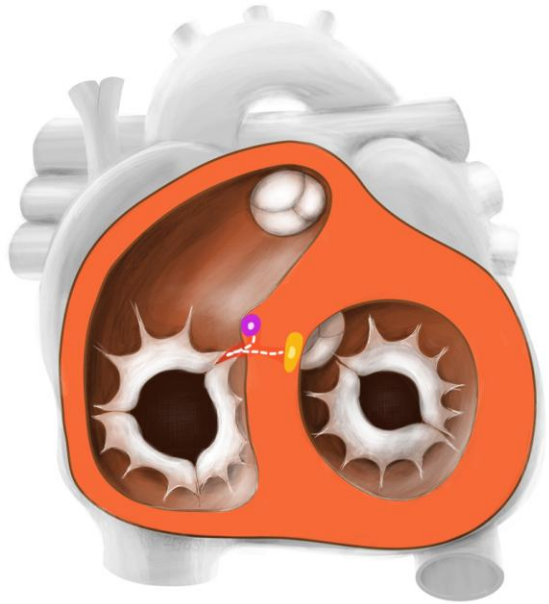
Collection 4

His Bundle Pacing, Proximal RBB Pacing,
and Distal RBB Pacing,
Single Bradycardia Patient

Collection 4: His Bundle Pacing, Proximal RBB Pacing, and Distal RBB Pacing, single patient (1/4)

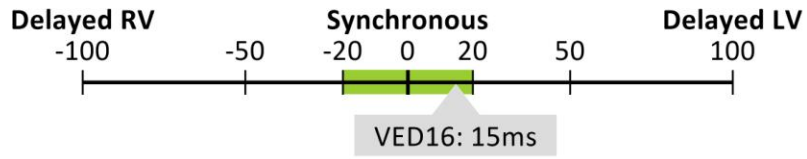
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

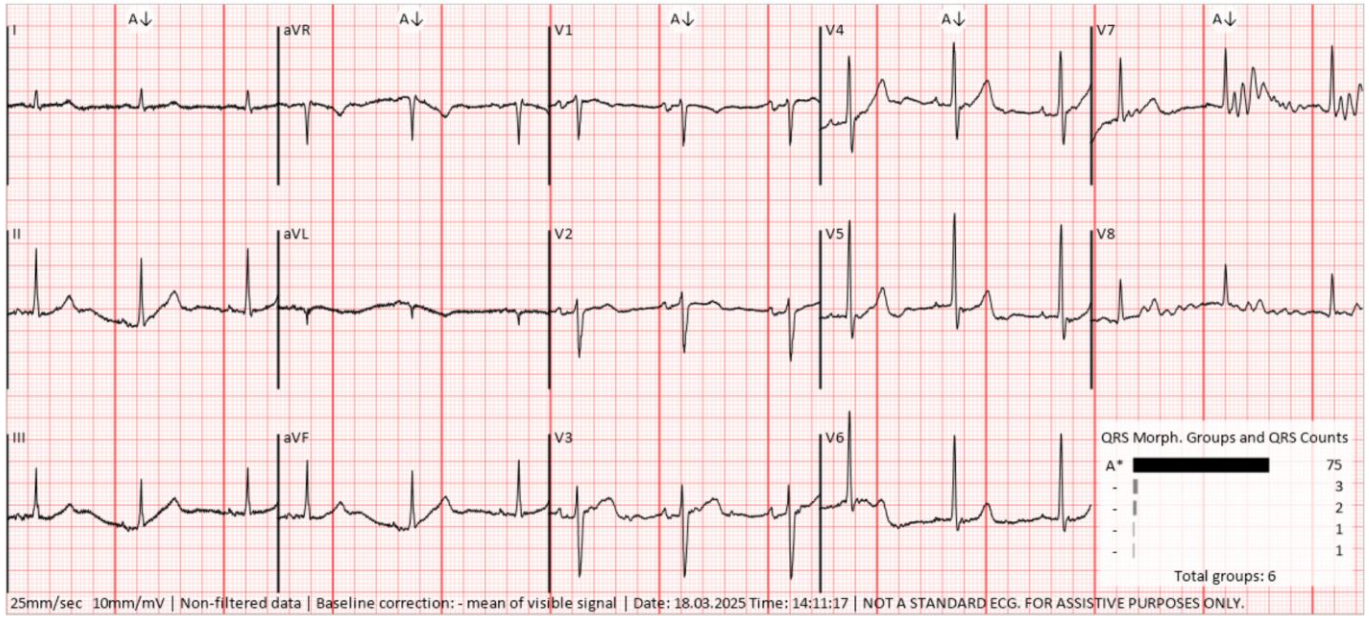


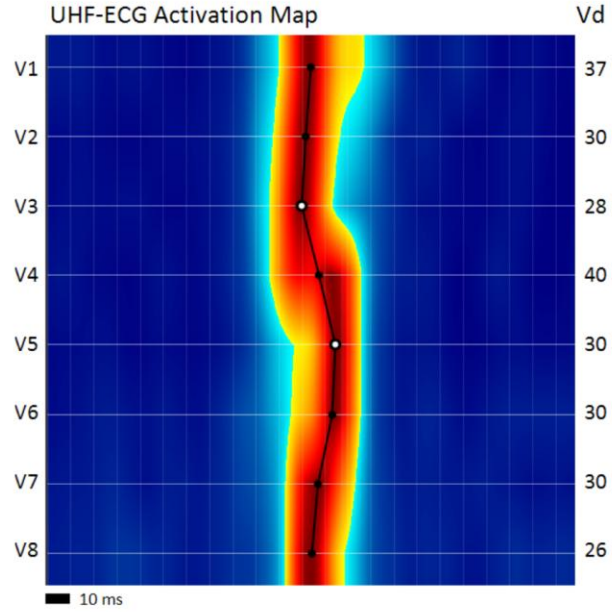


Bradycardia

spontaneous activation, VD 33 ms

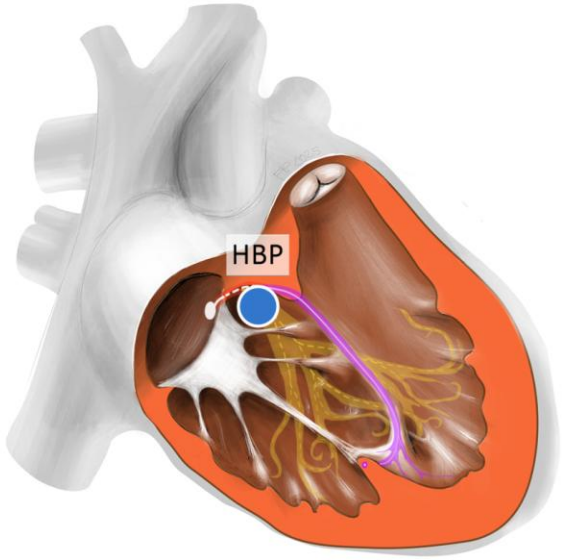


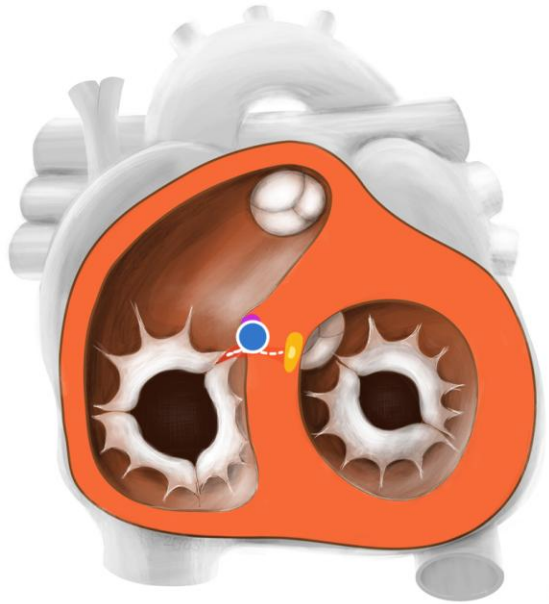




Collection 4: His Bundle Pacing, Proximal RBB Pacing, and Distal RBB Pacing, single patient (2/4)

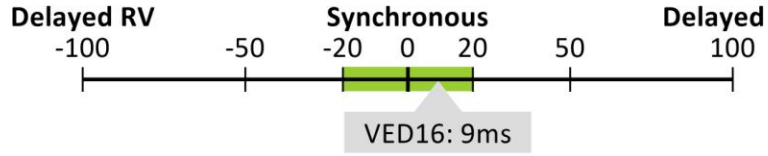
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

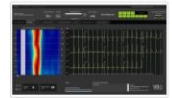


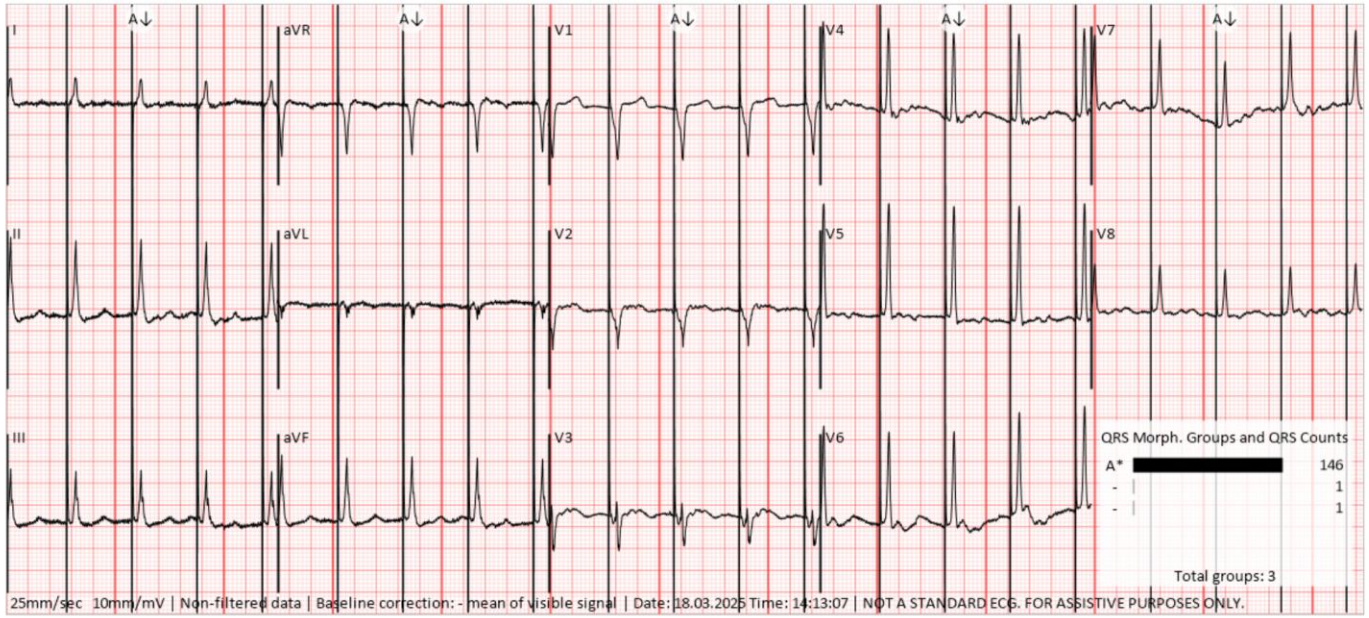


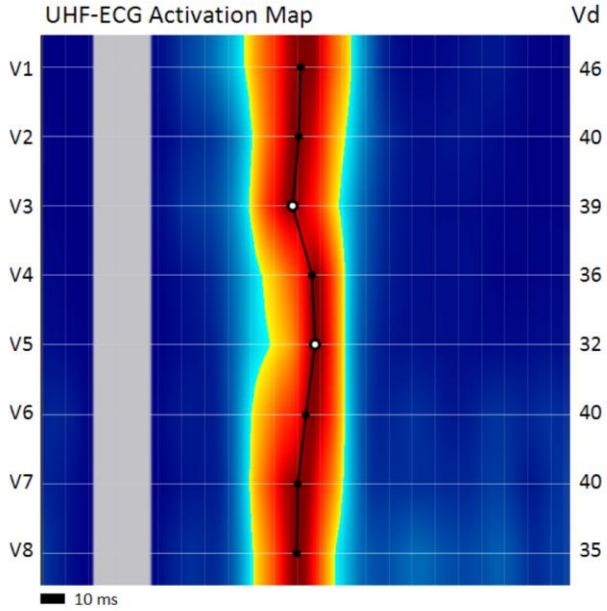
nsHBP

non selective His Bundle Pacing, VD 39 ms



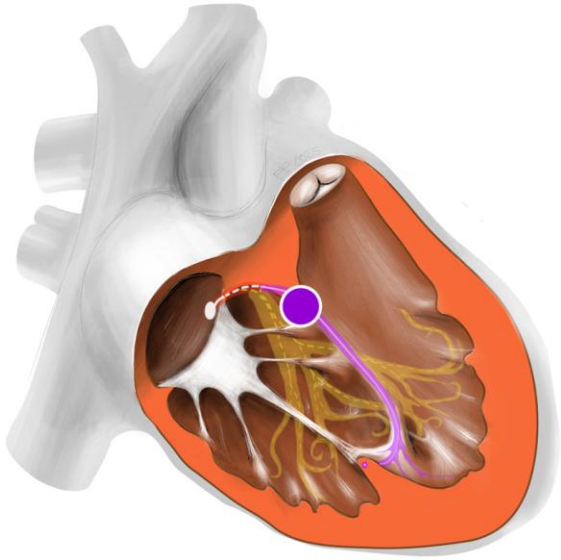


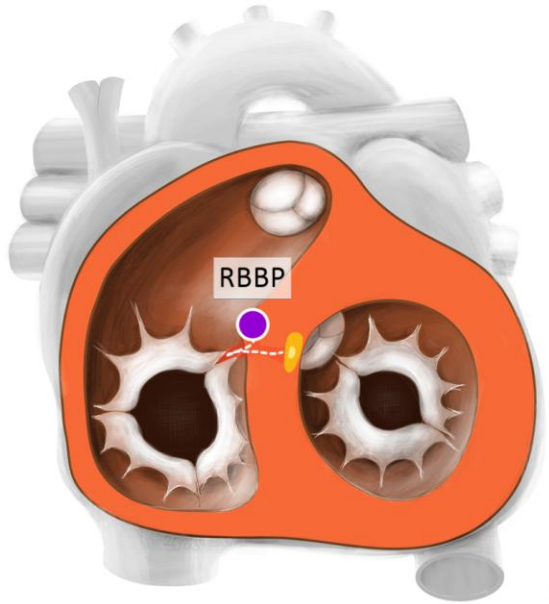




Collection 4: His Bundle Pacing, Proximal RBB Pacing, and Distal RBB Pacing, single patient (3/4)

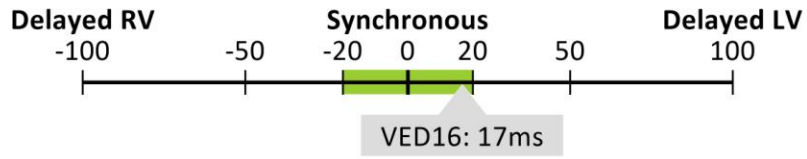
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

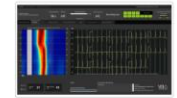


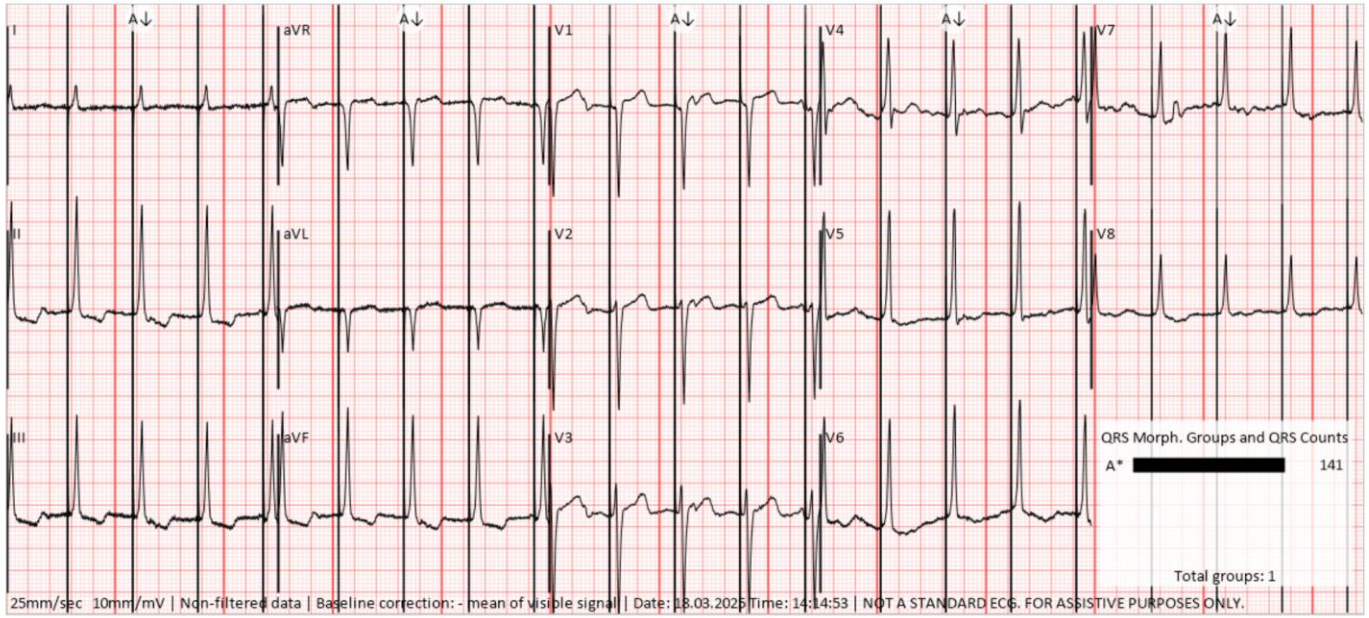


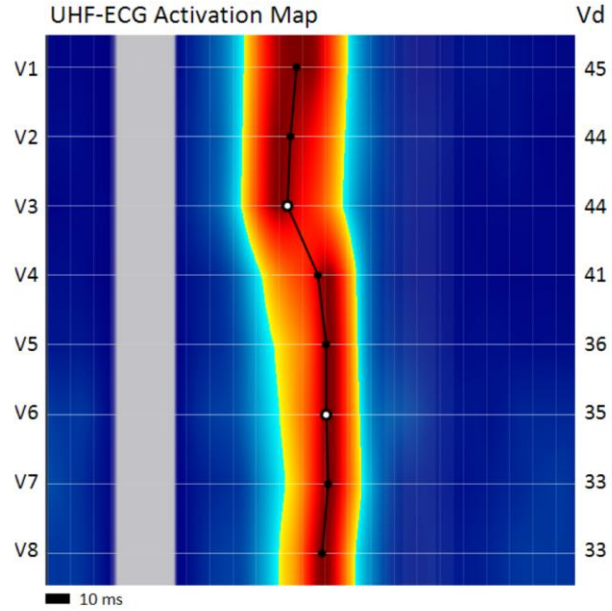
proximal RBBP

proximal Right Bundle Branch Pacing, VD 41 ms



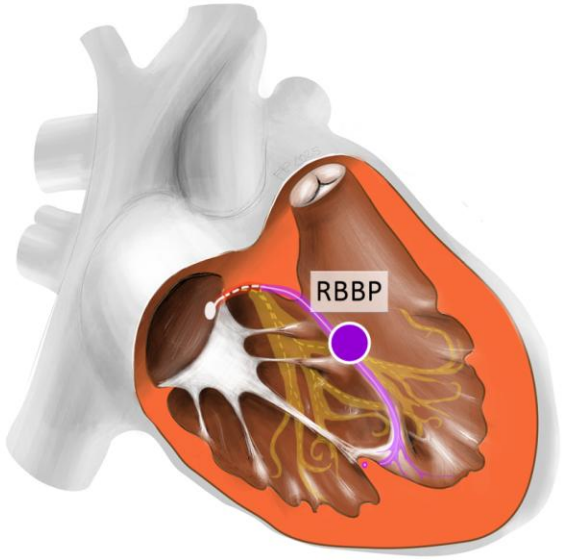


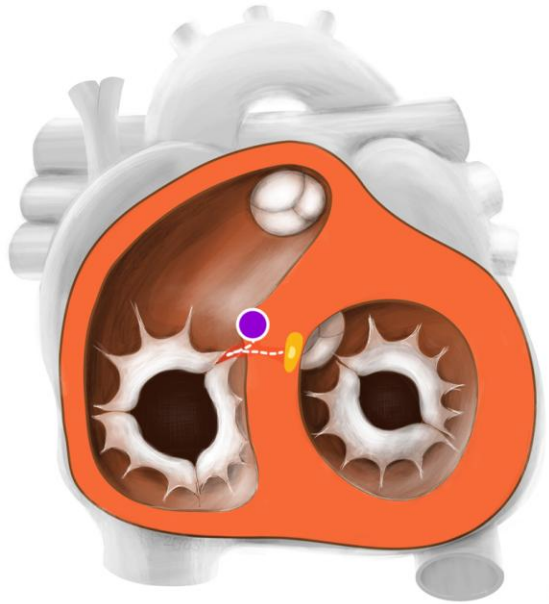




Collection 4: His Bundle Pacing, Proximal RBB Pacing, and Distal RBB Pacing, single patient (4/4)

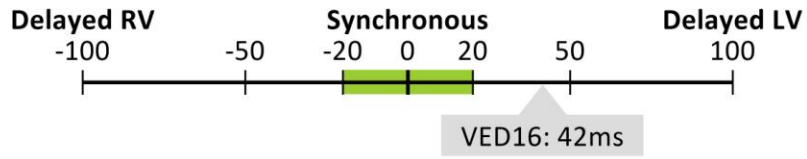
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

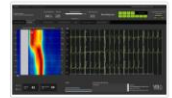


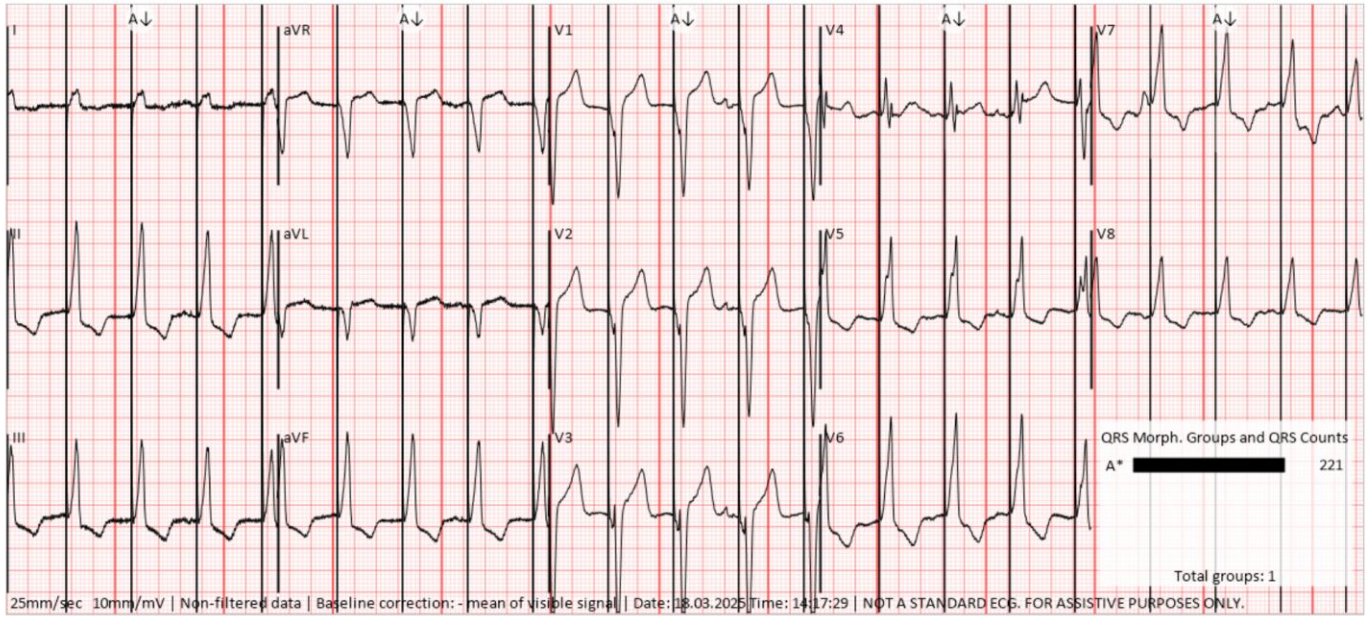


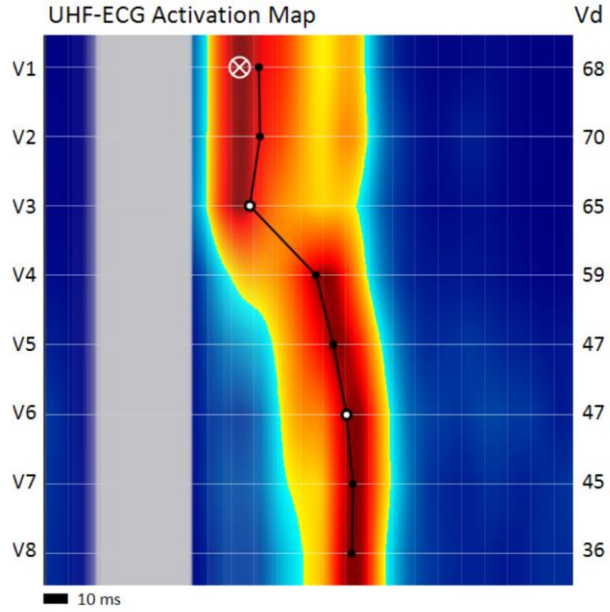
distal RBBP

distal Right Bundle Branch Pacing, VD 59 ms









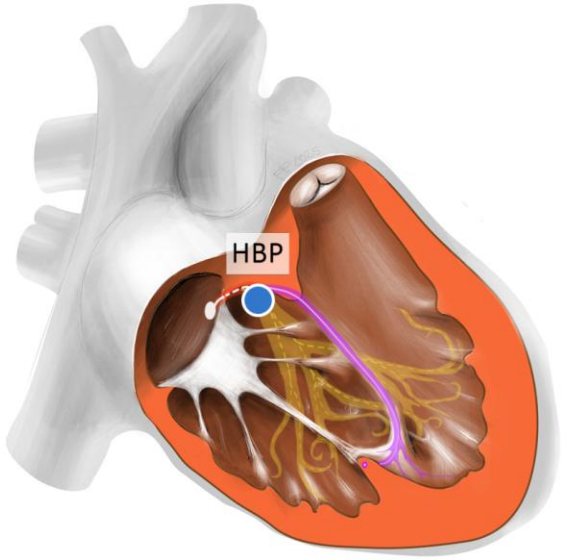
Collection 5

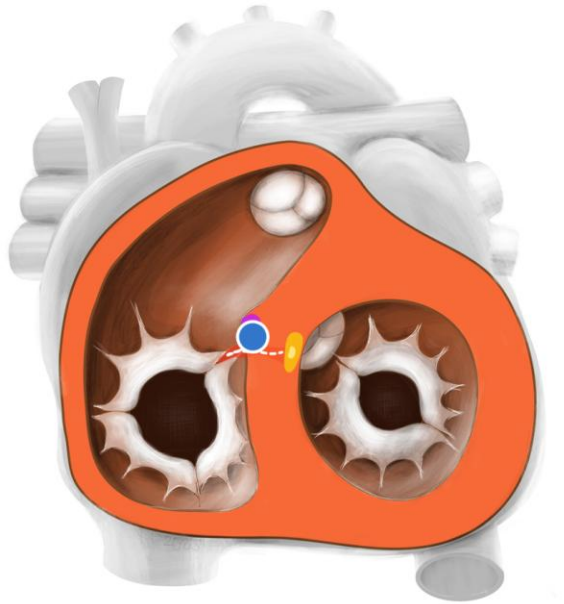
Right Ventricular Pacing,

Examples

Collection 5: Right Ventricular Pacing Examples (1/8)

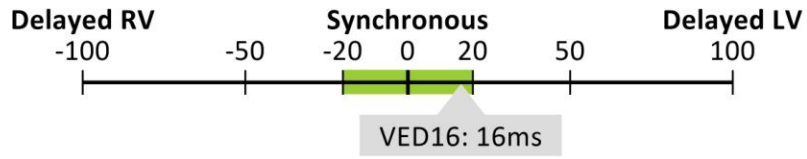
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

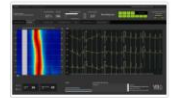


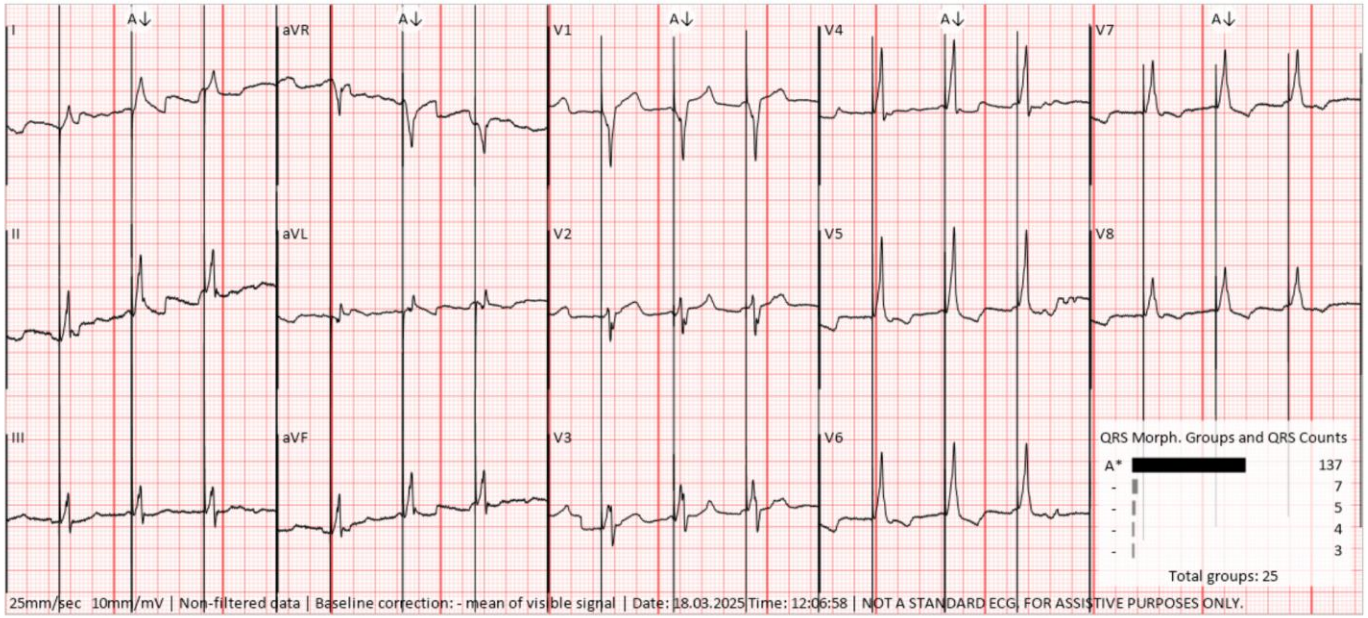


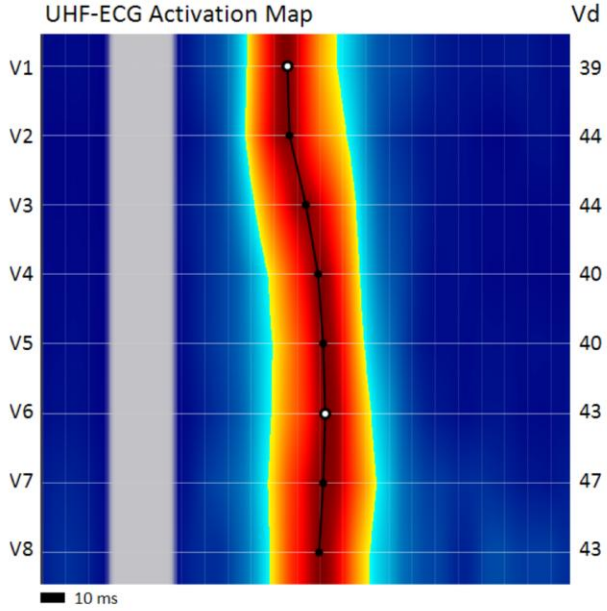
distal HBP

distal His Bundle Pacing, VD 42 ms



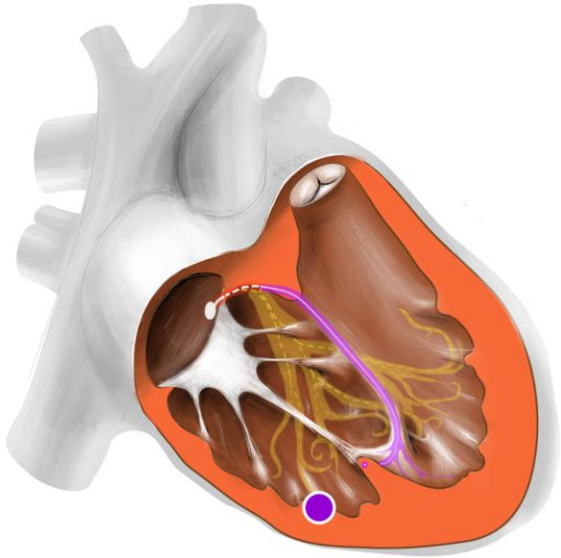


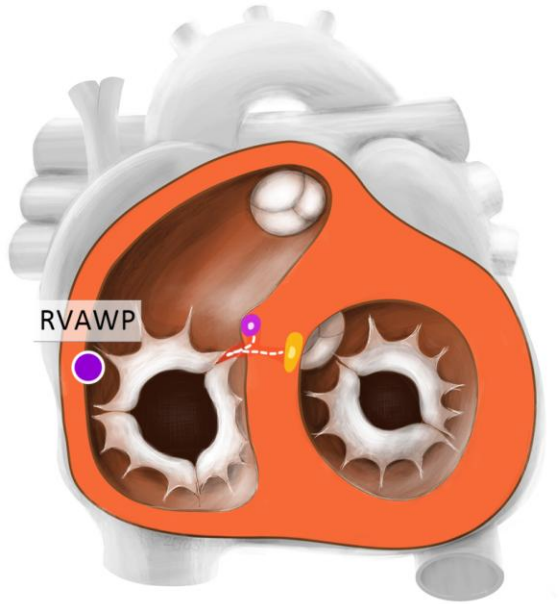




Collection 5: Right Ventricular Pacing Examples (2/8)

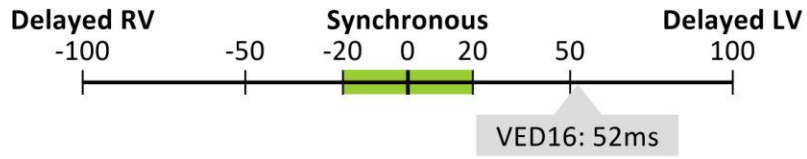
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

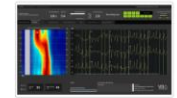


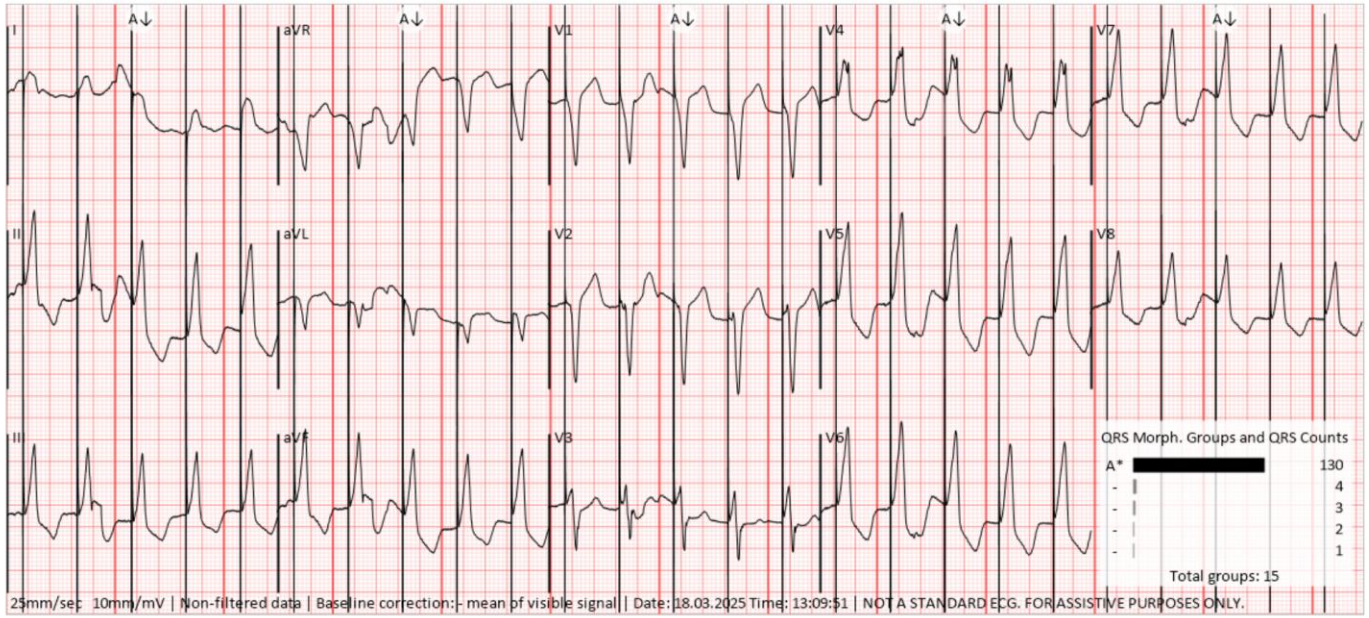


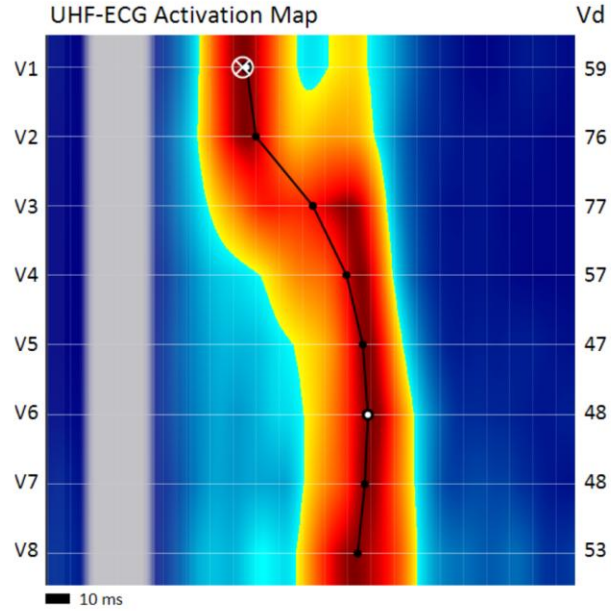
RV ant wall

Right Ventricular anterior wall, VD 61 ms



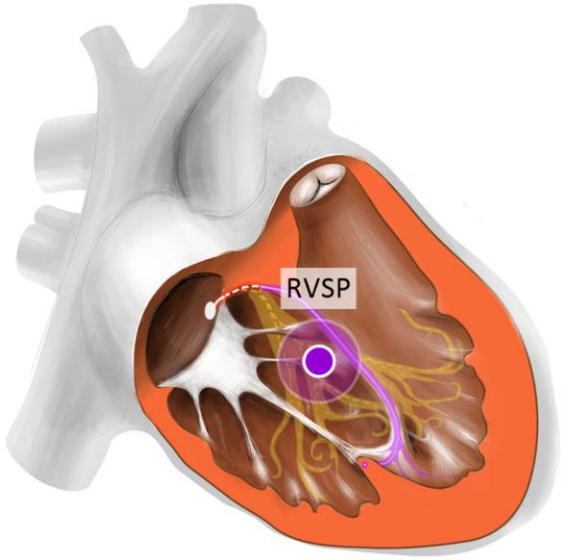


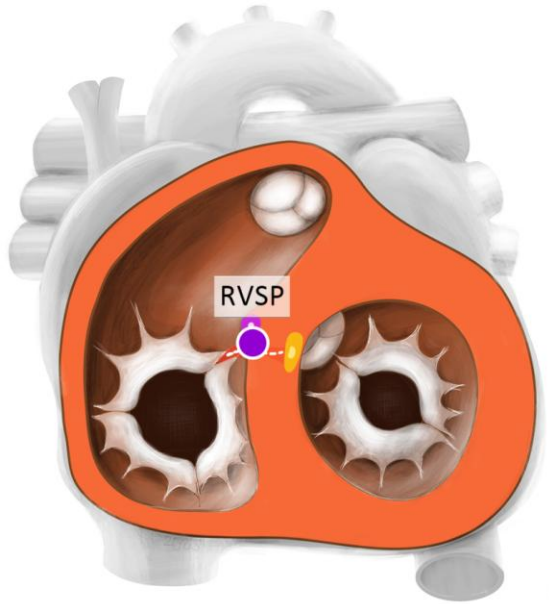




Collection 5: Right Ventricular Pacing Examples (3/8)

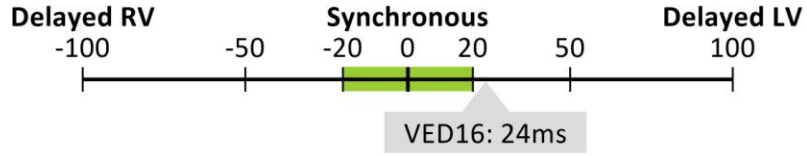
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

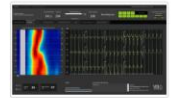


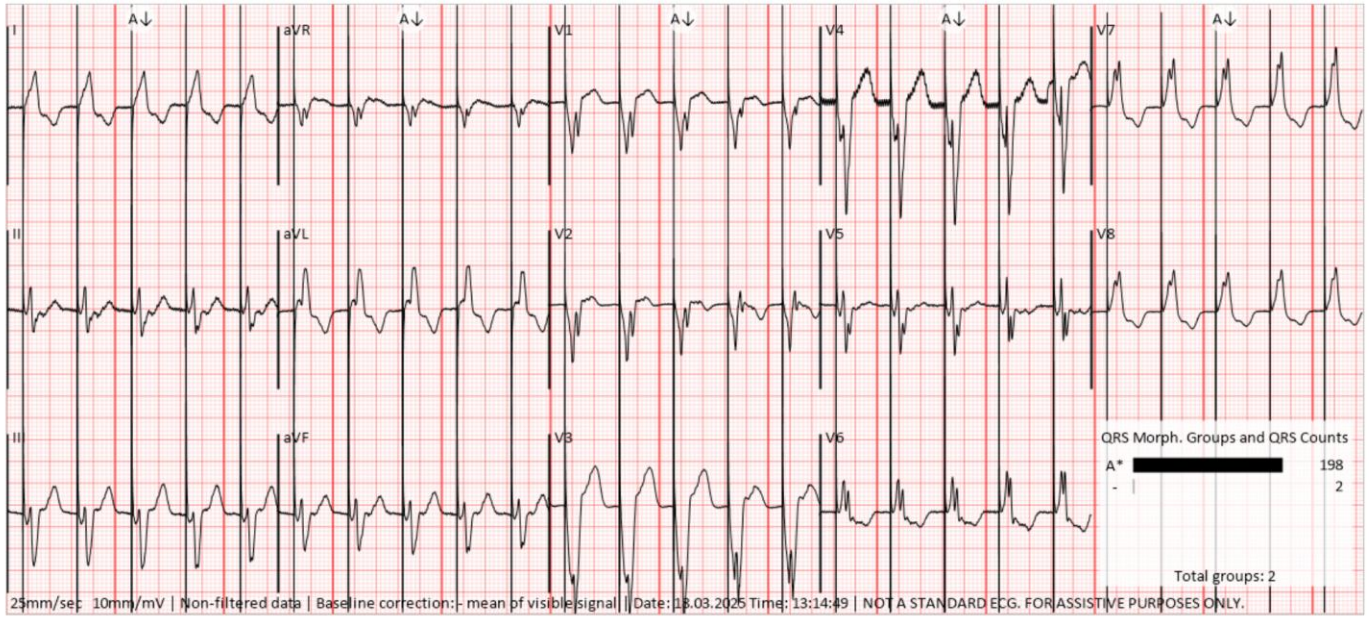


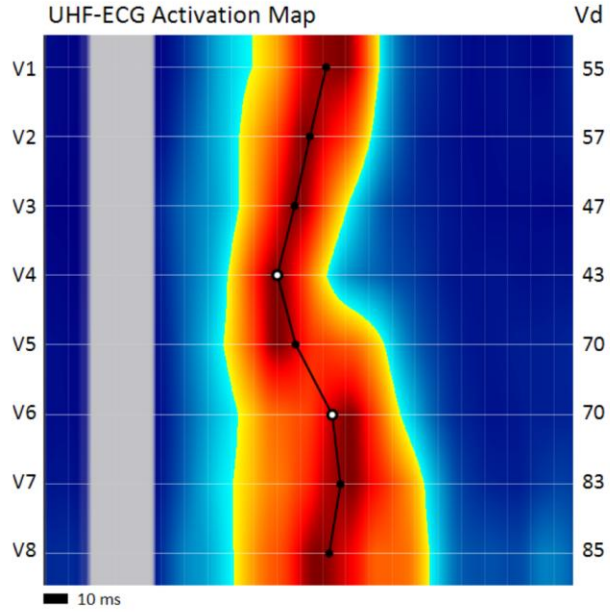
RVSP_1

Right Ventricular Septal Pacing, VD 57 ms



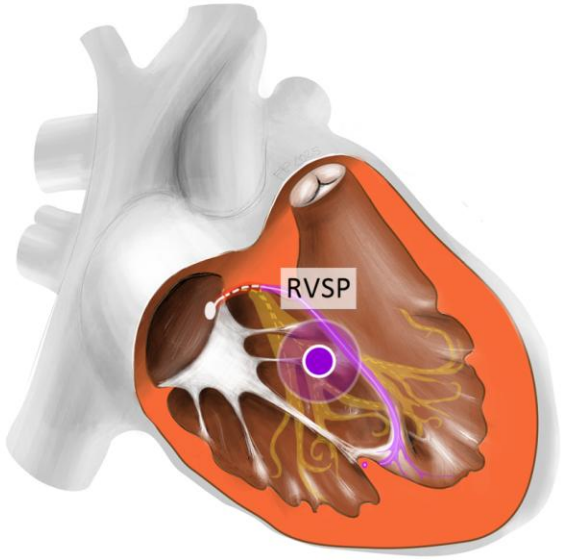


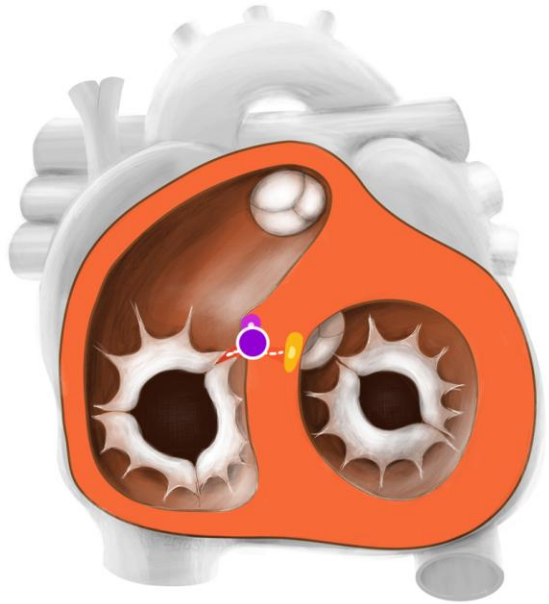




Collection 5: Right Ventricular Pacing Examples (4/8)

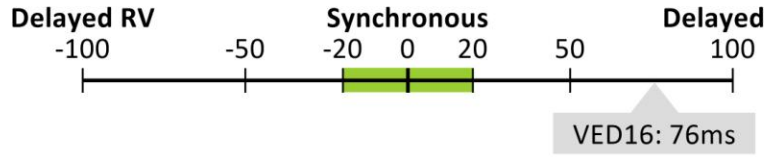
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

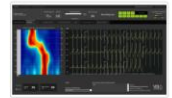


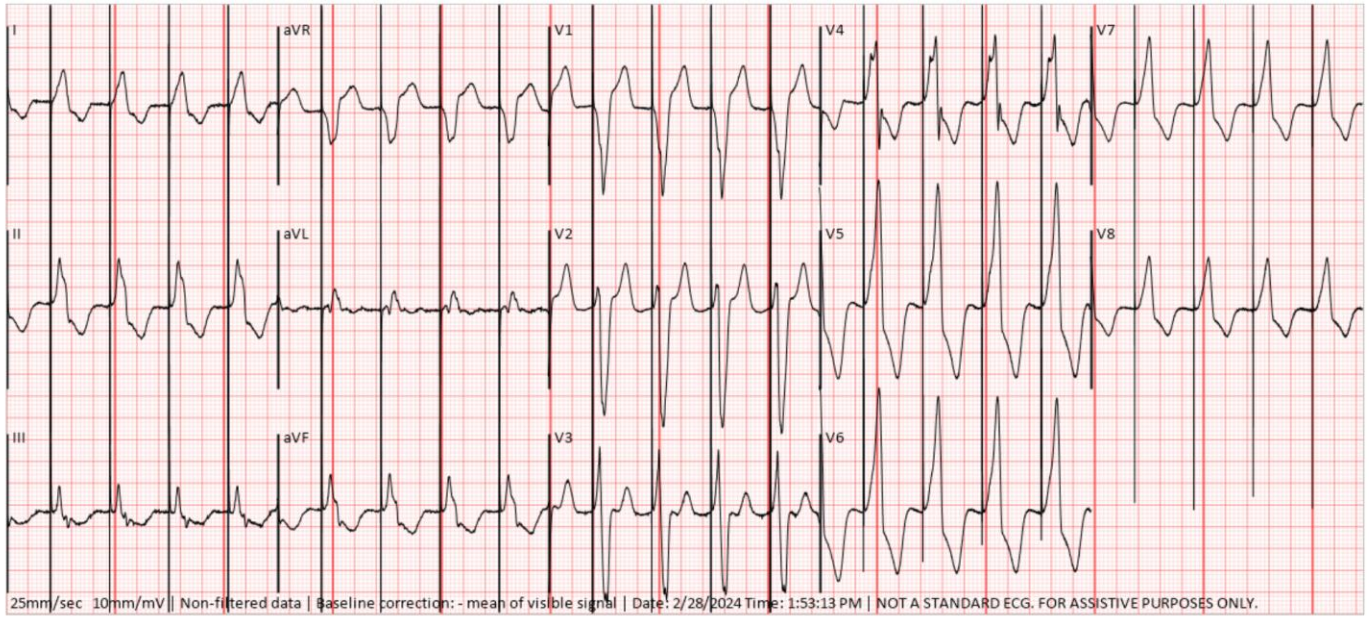


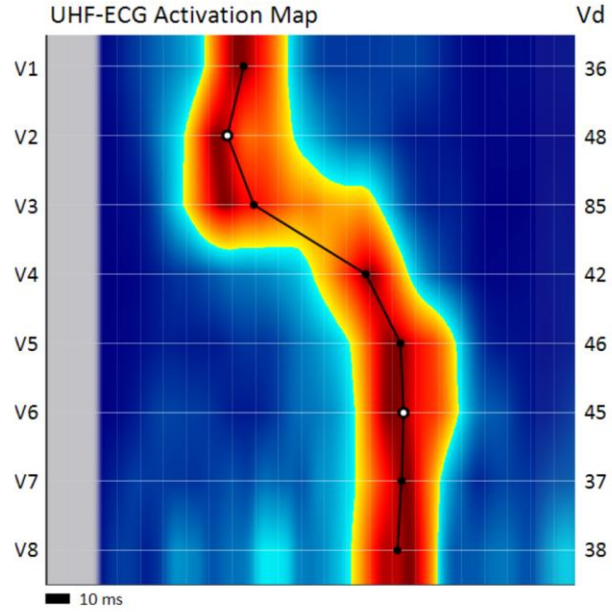
RVSP_2

Right Ventricular Septal Pacing, VD 50 ms



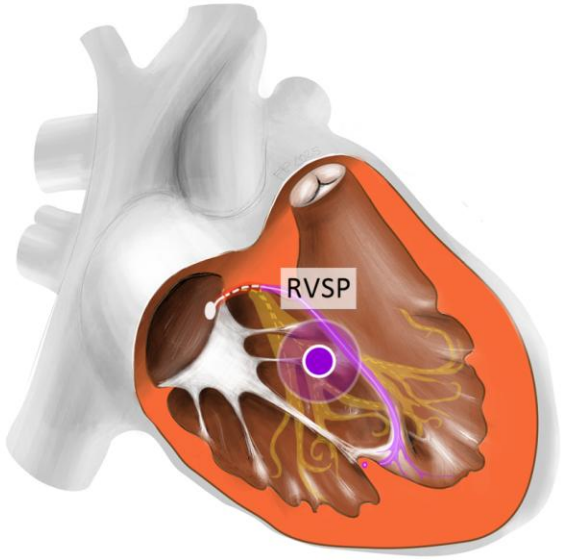


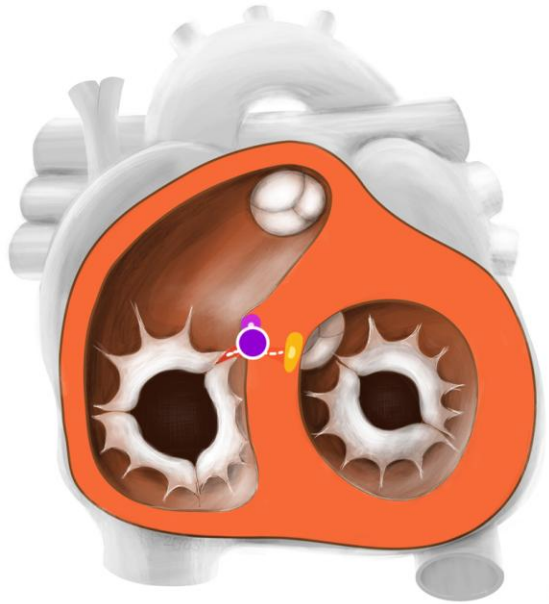




Collection 5: Right Ventricular Pacing Examples (5/8)

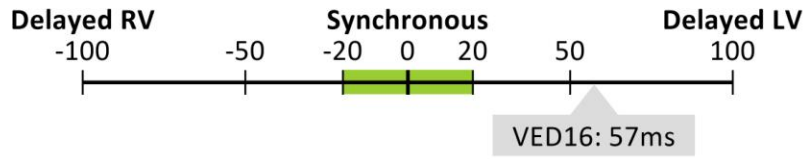
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

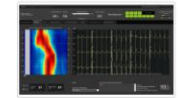


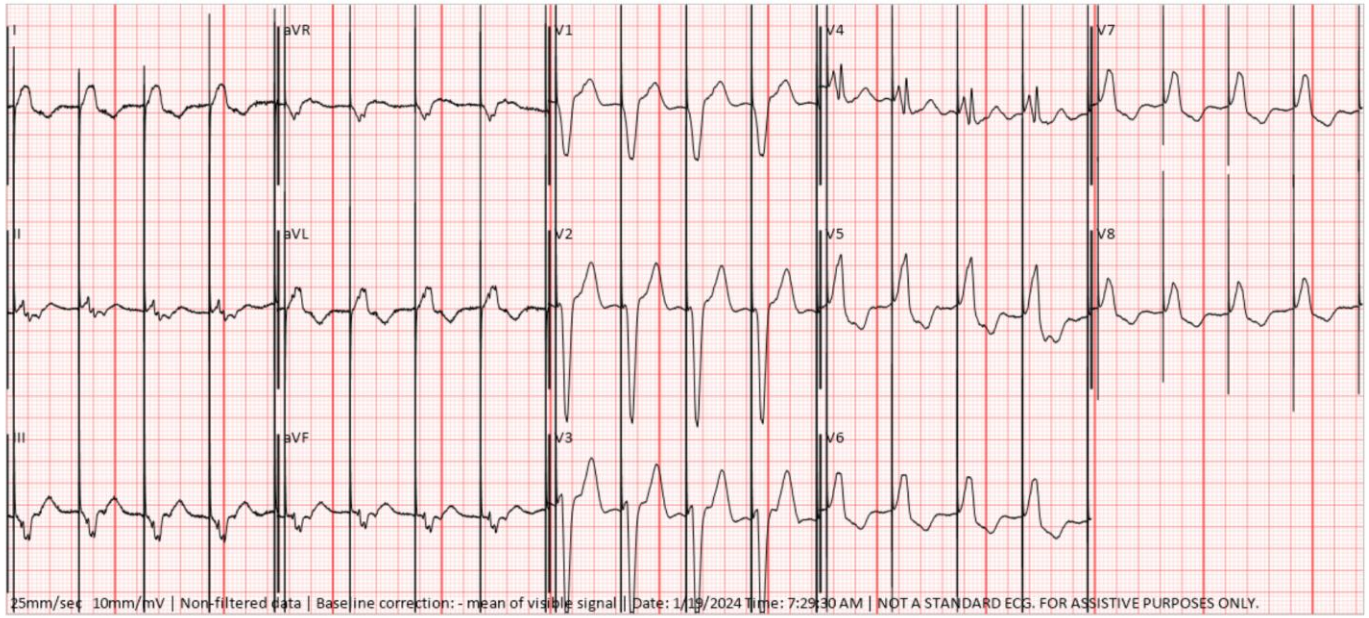


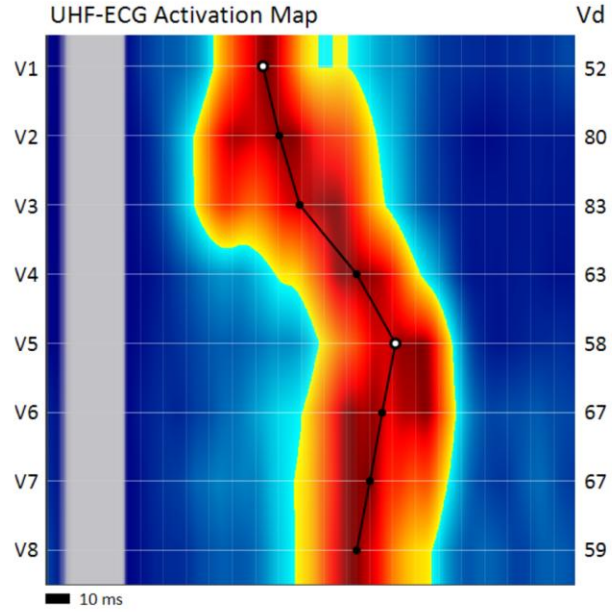
RVSP_3

Right Ventricular Septal Pacing, VD 67 ms



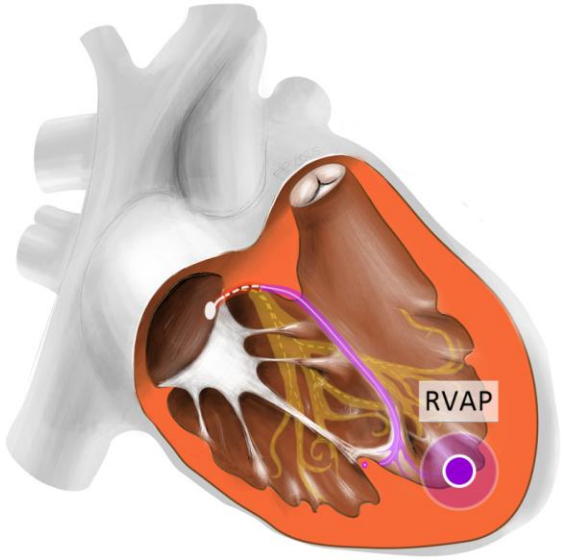


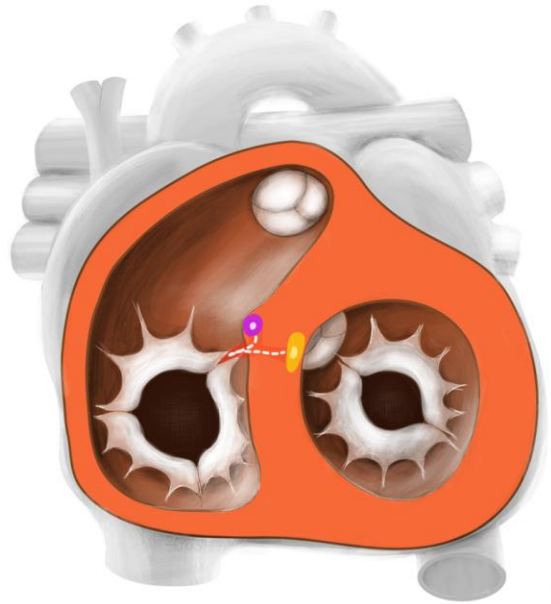




Collection 5: Right Ventricular Pacing Examples (6/8)

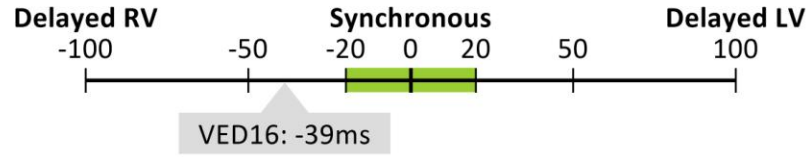
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

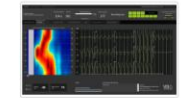


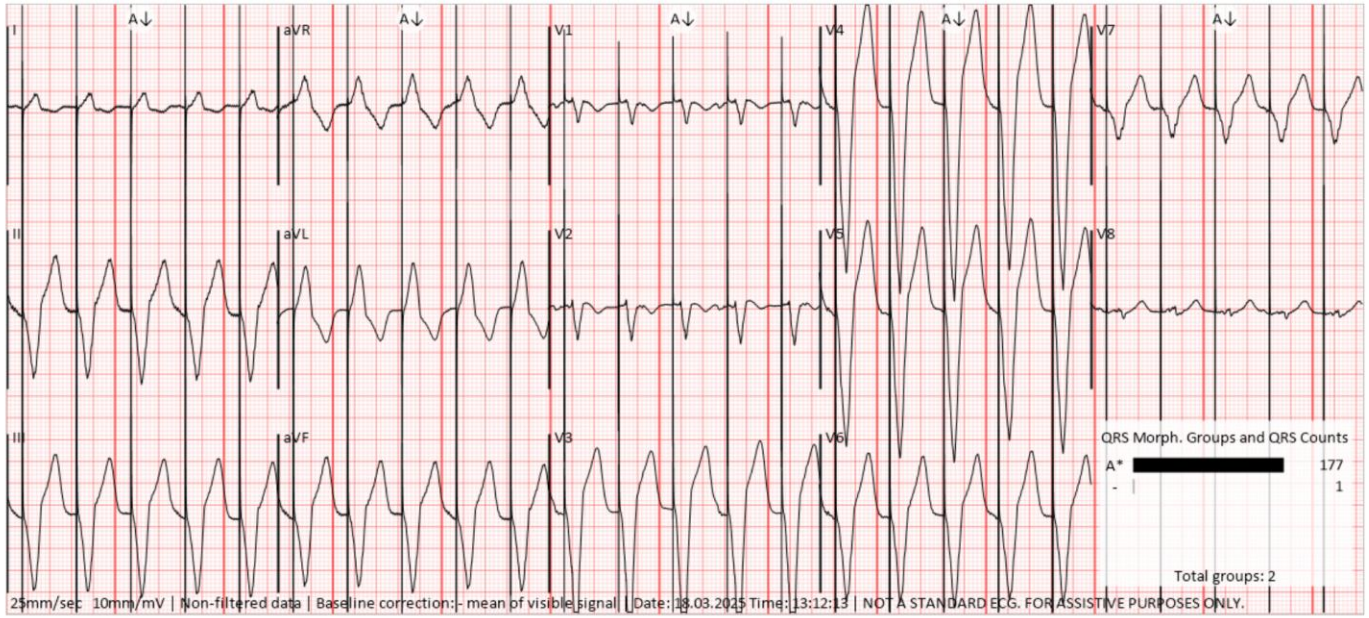


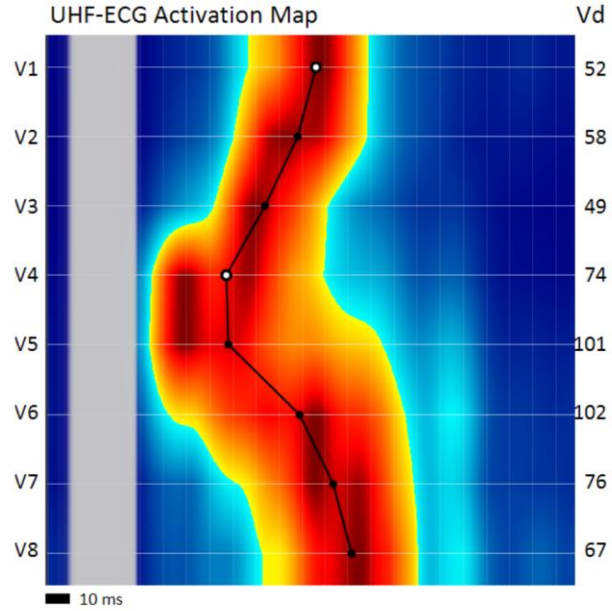
RVAP_1

Right Ventricular Apical Pacing, VD 73 ms



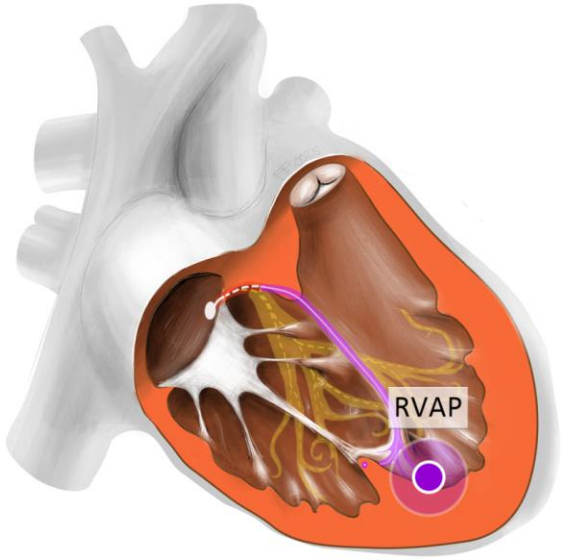


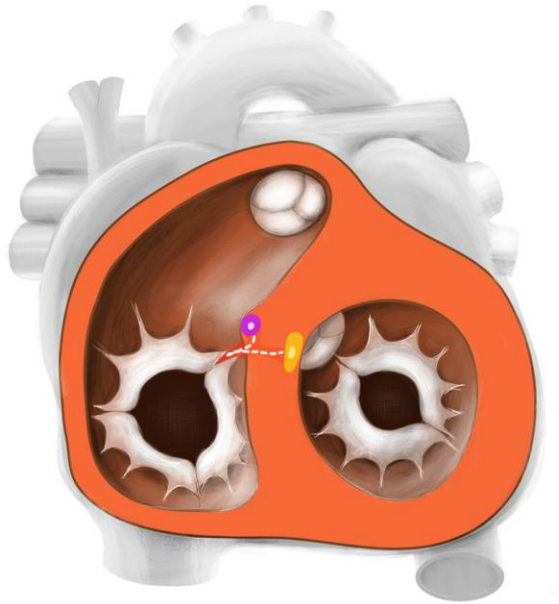




Collection 5: Right Ventricular Pacing Examples (7/8)

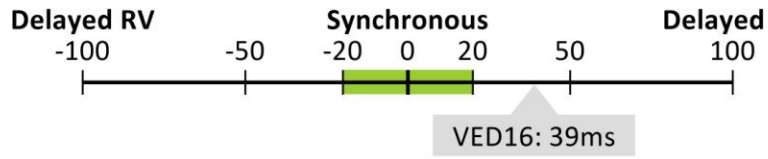
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

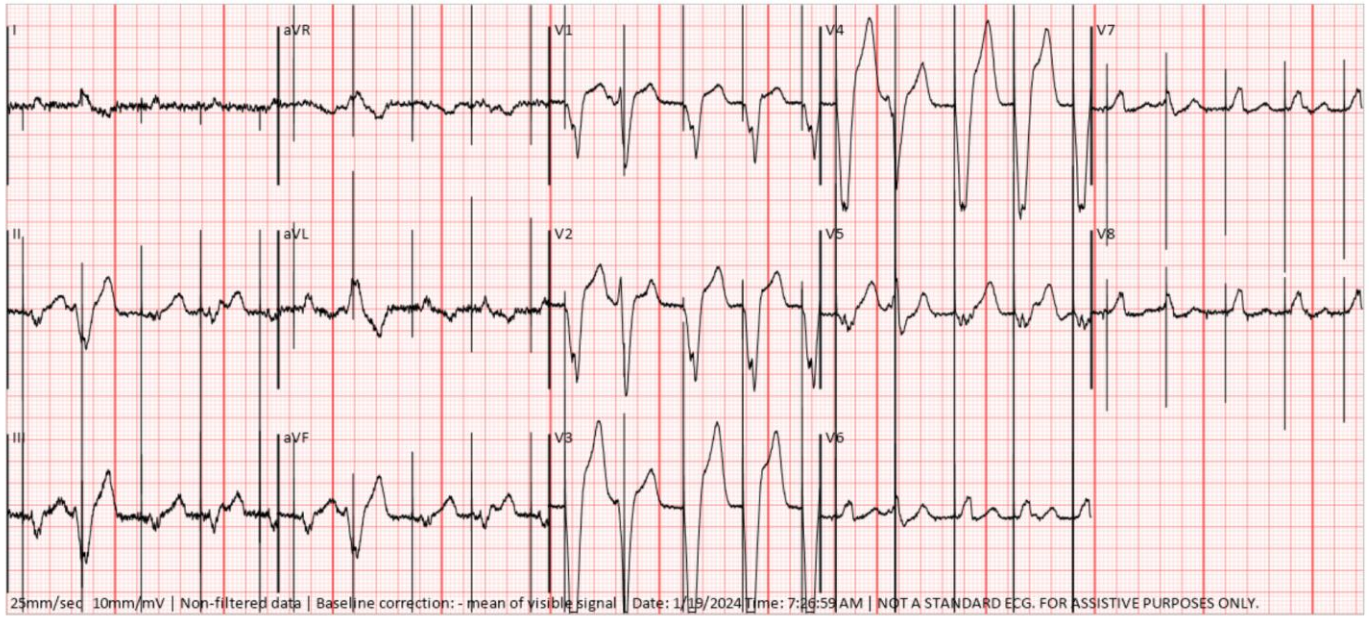


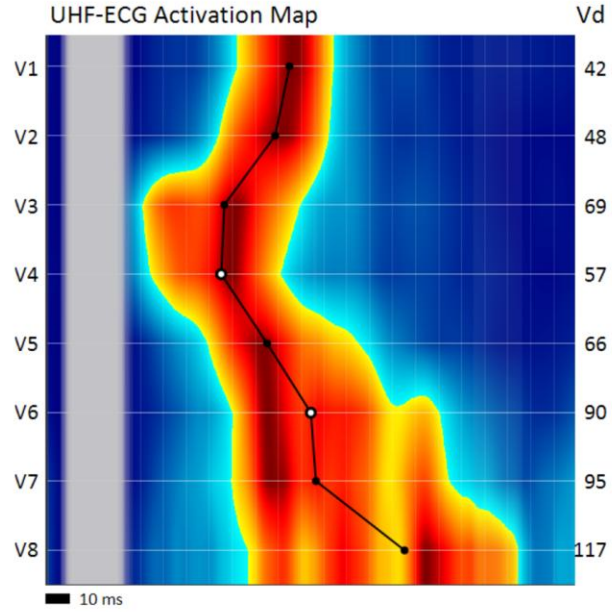


RVAP_2

Right Ventricular Apical Pacing, VD 62 ms

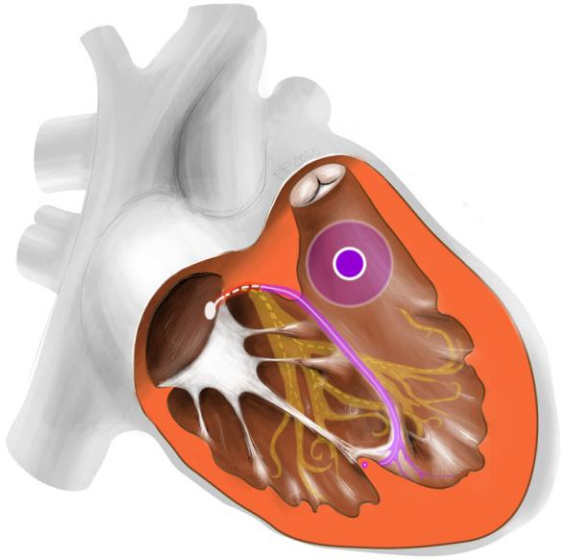


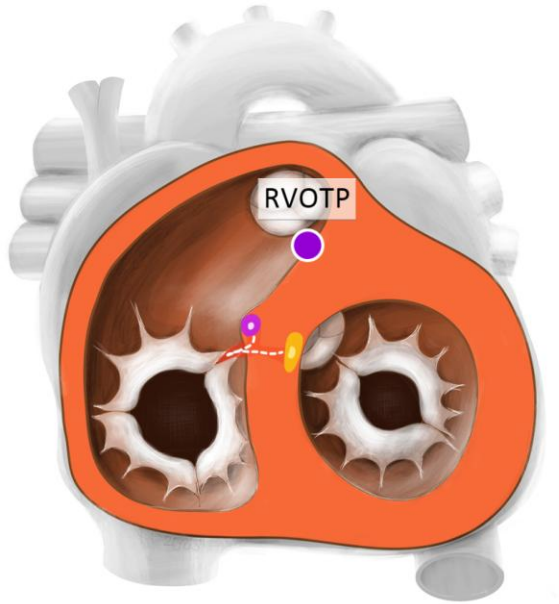




Collection 5: Right Ventricular Pacing Examples (8/8)

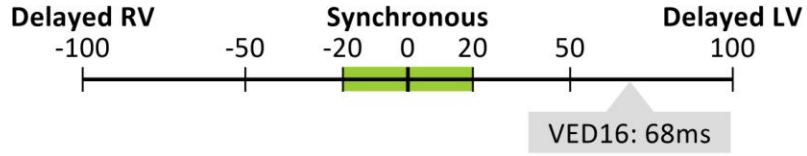
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

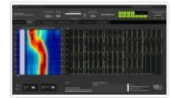


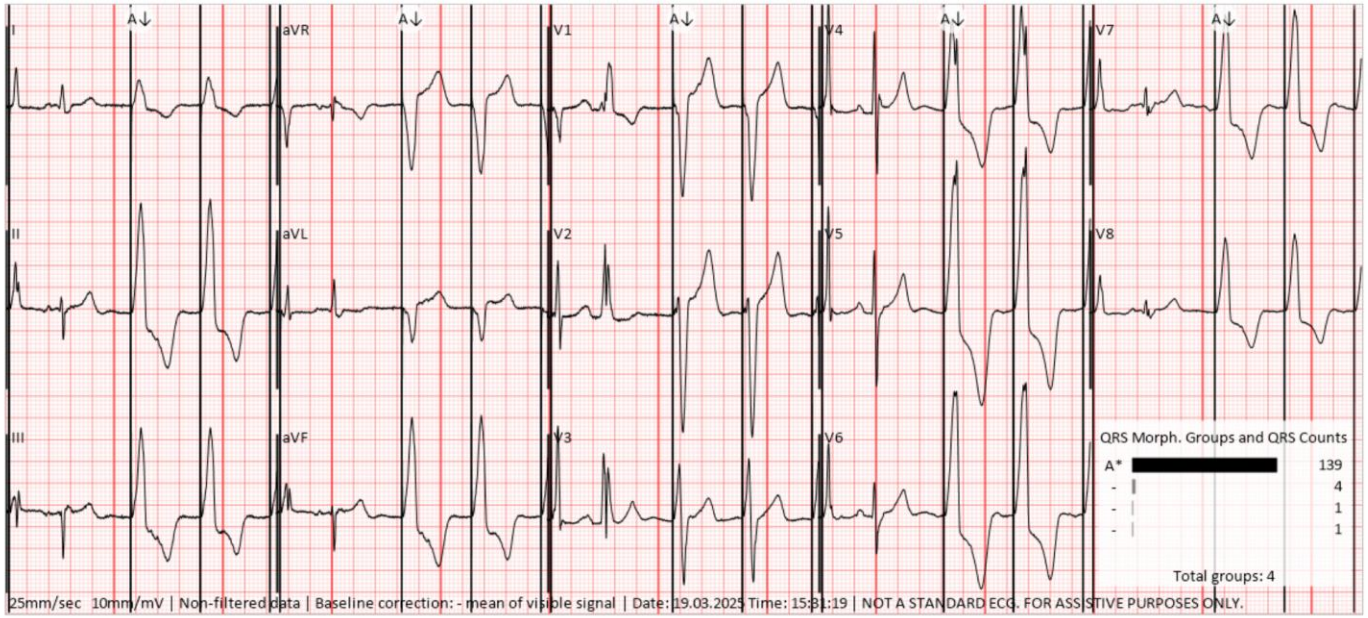


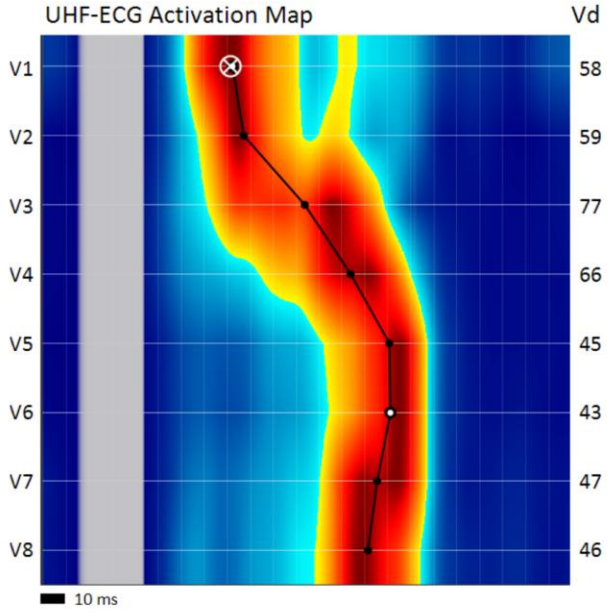
RVOTP

Right Ventricular Outflow Tract Pacing, VD 58 ms









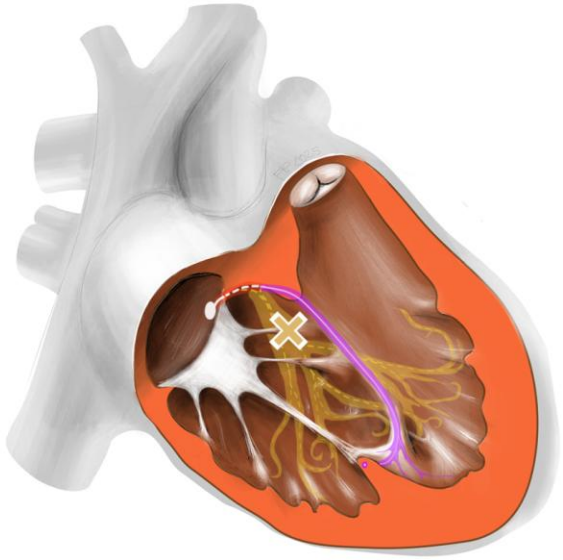
Collection 6

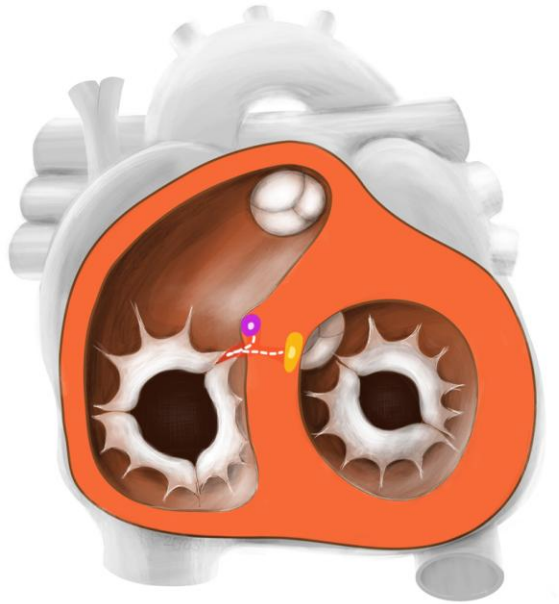
LBBB from IVCD Differentiation,

Examples

Collection 6: LBBB from IVCD Differentiation Examples (1/6)

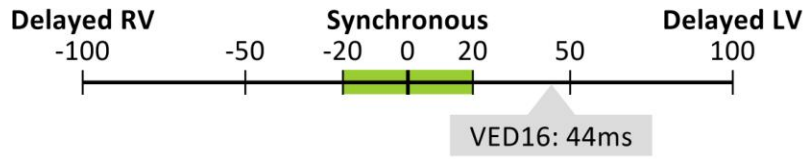
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

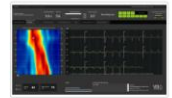


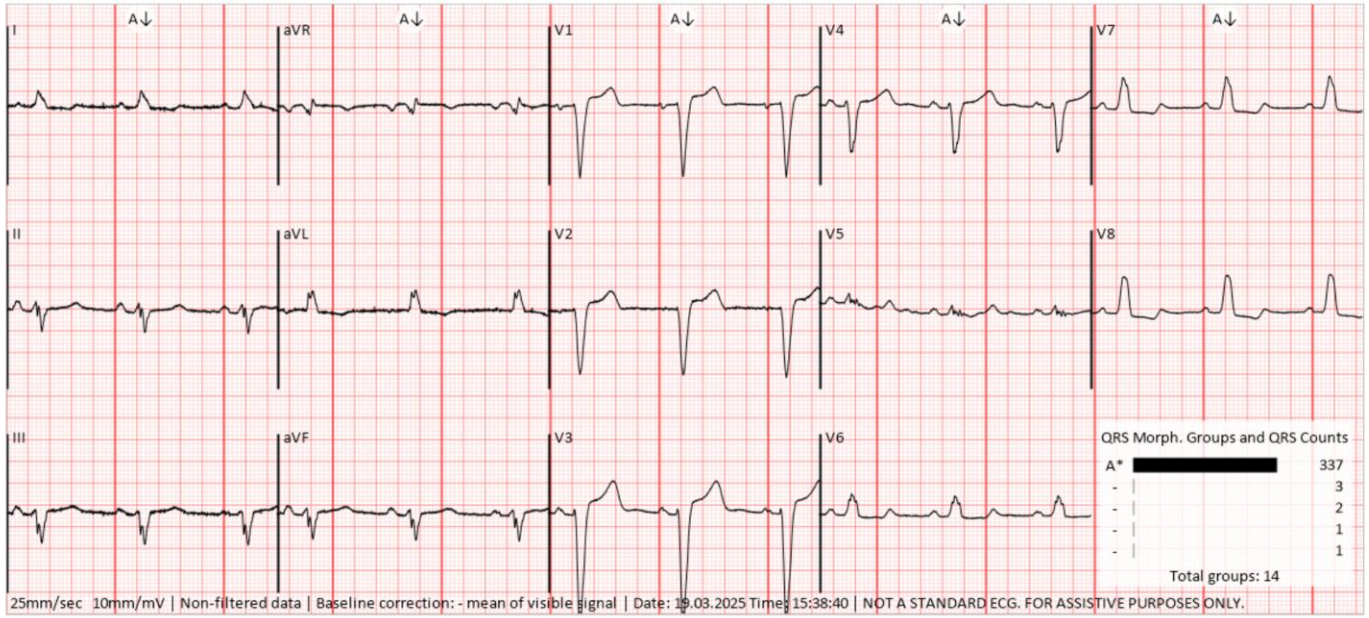


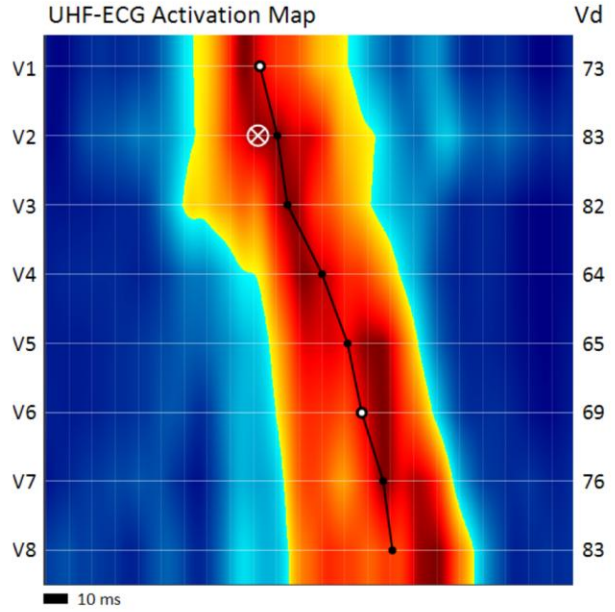
LBBB_1

Left Bundle Branch Block, VD 73 ms



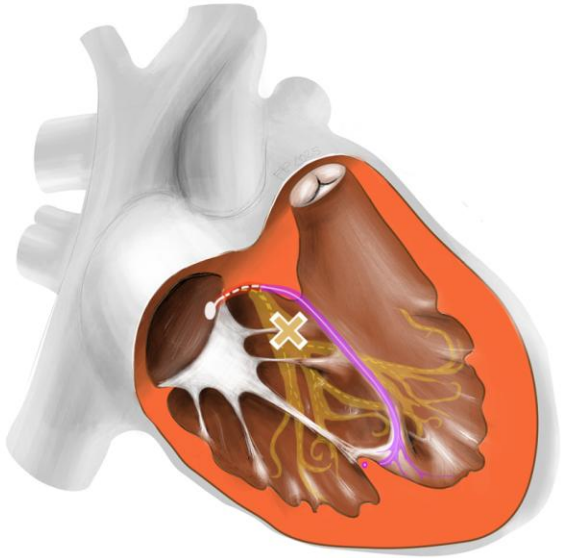


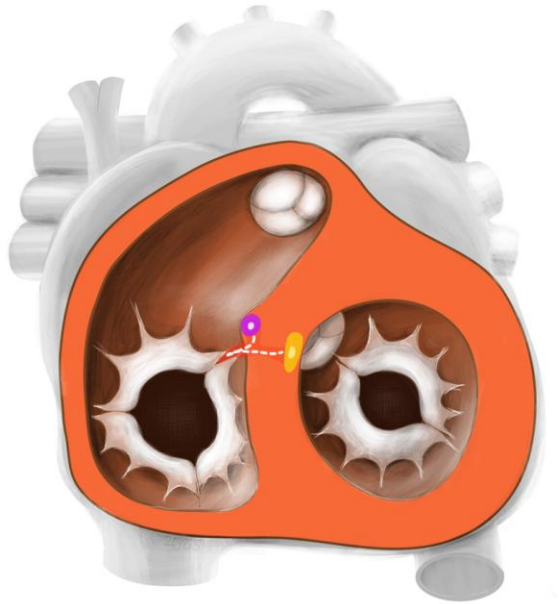




Collection 6: LBBB from IVCD Differentiation Examples (2/6)

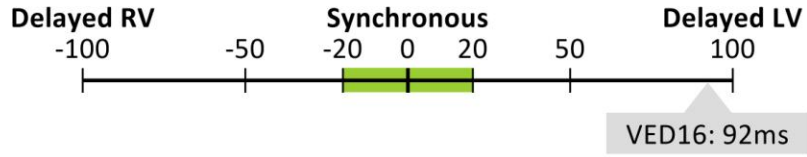
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

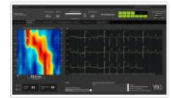


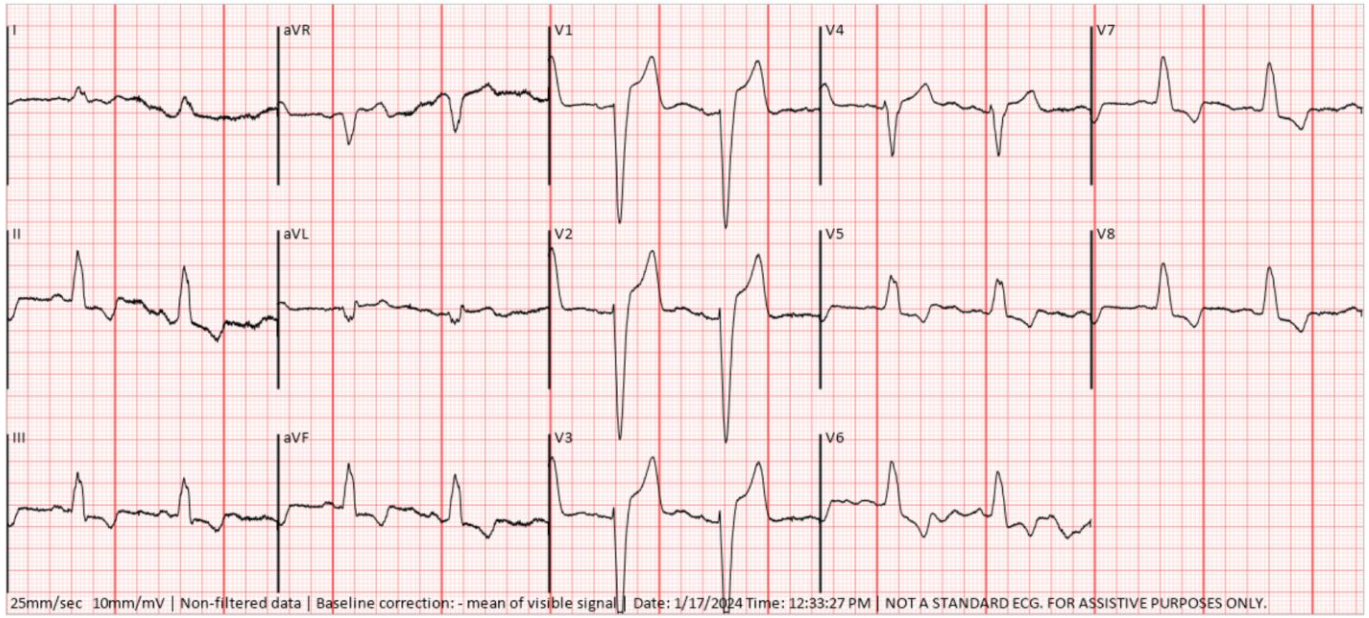


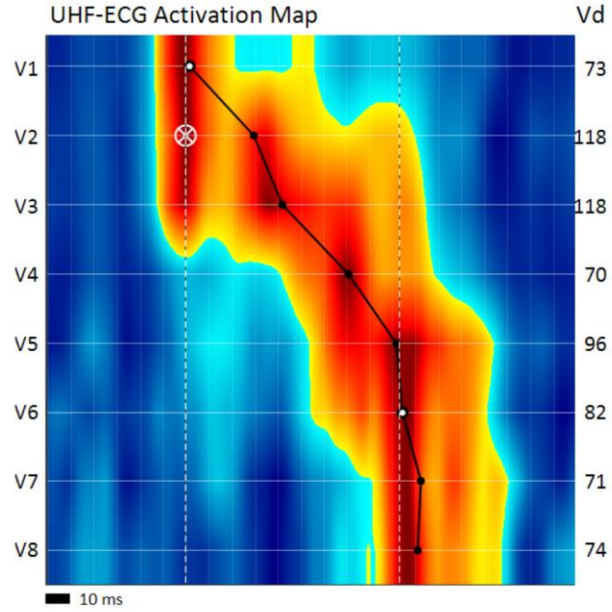
LBBB_2

Left Bundle Branch Block, VD 73 ms

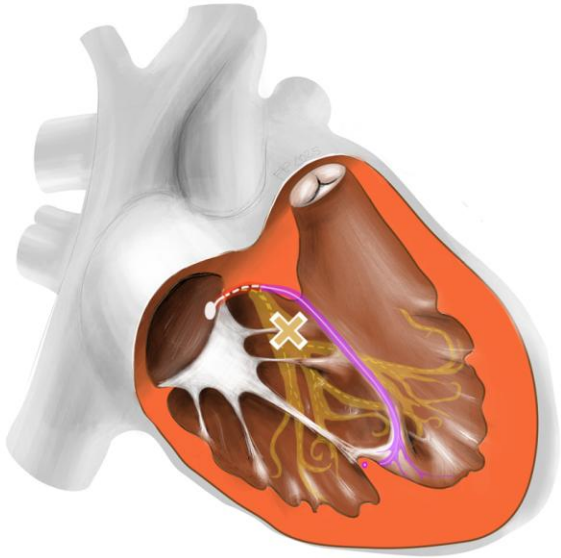


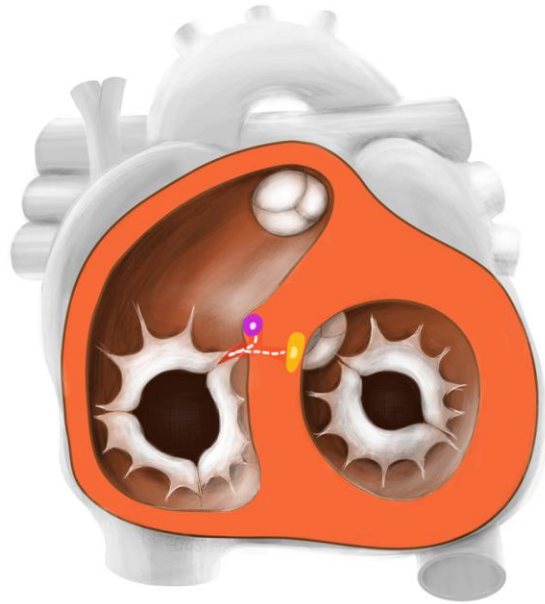






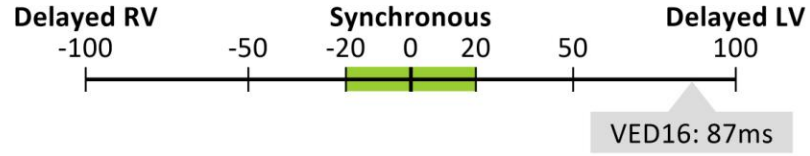
Collection 6: LBBB from IVCD Differentiation Examples (3/6)

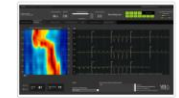


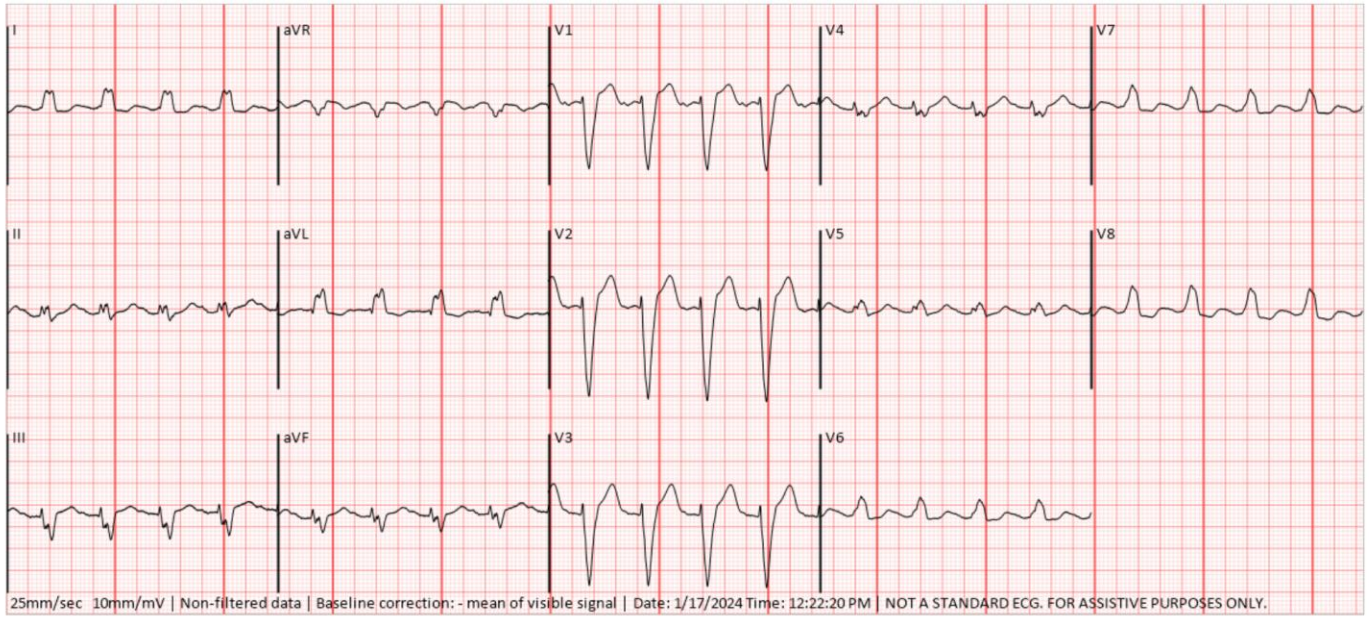


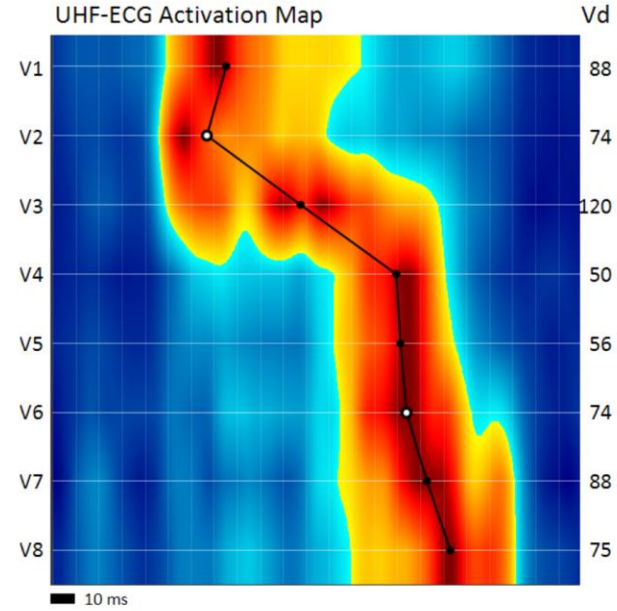
LBBB_3

Left Bundle Branch Block, VD 77 ms



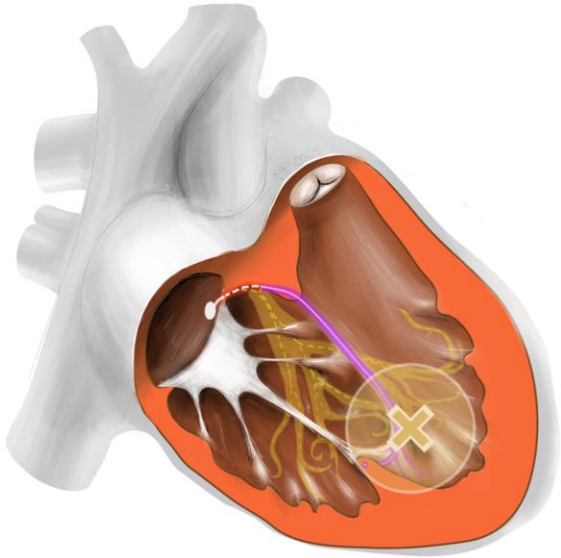


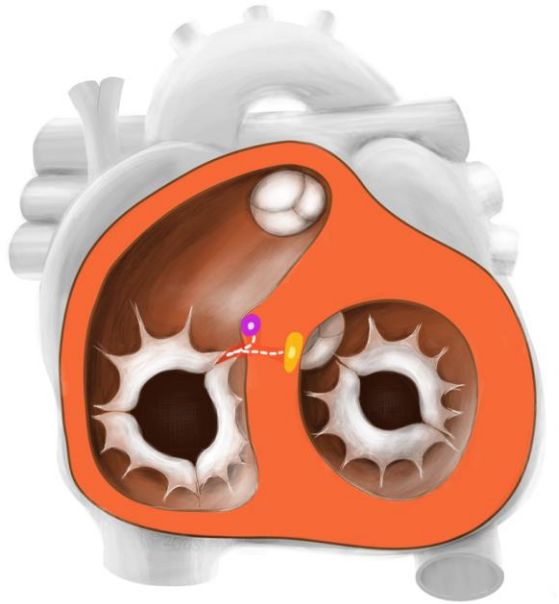




Collection 6: LBBB from IVCD Differentiation Examples (4/6)

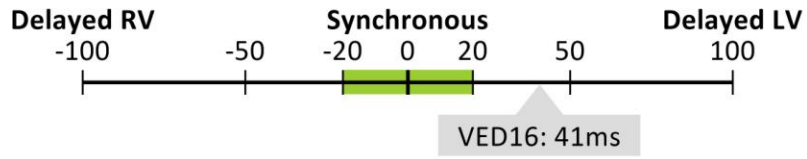
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

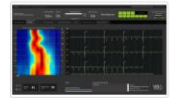


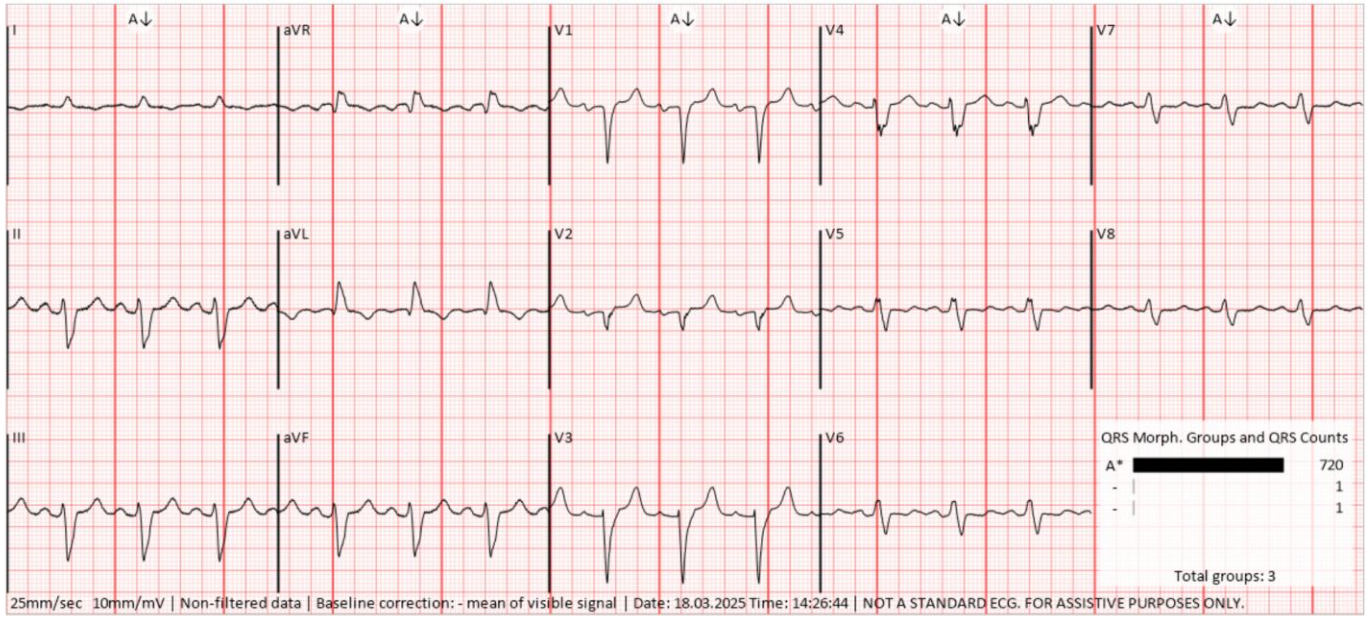


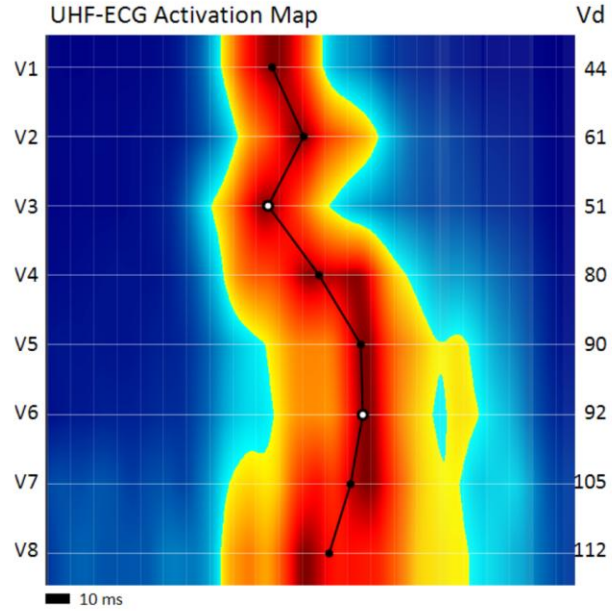
IVCD_1

Intraventricular Conduction Disturbance, VD 70 ms



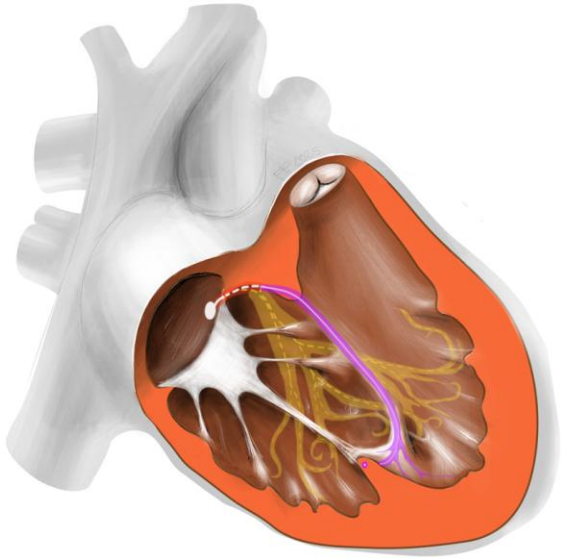


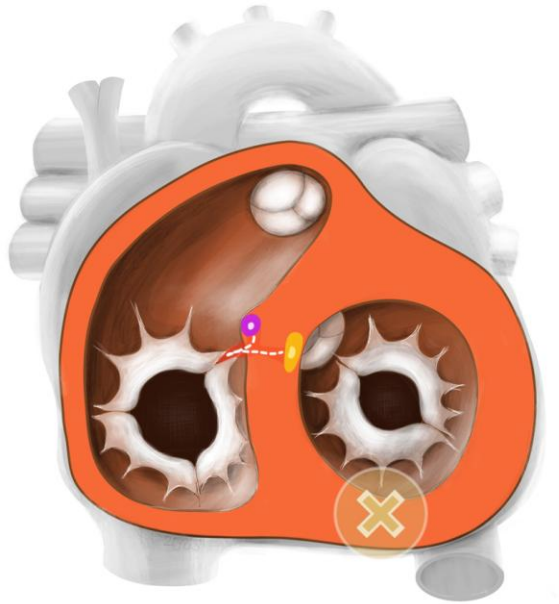




Collection 6: LBBB from IVCD Differentiation Examples (5/6)

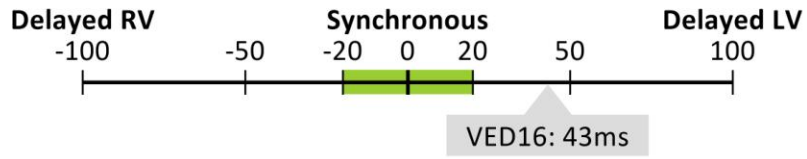
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

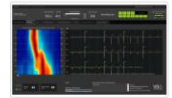


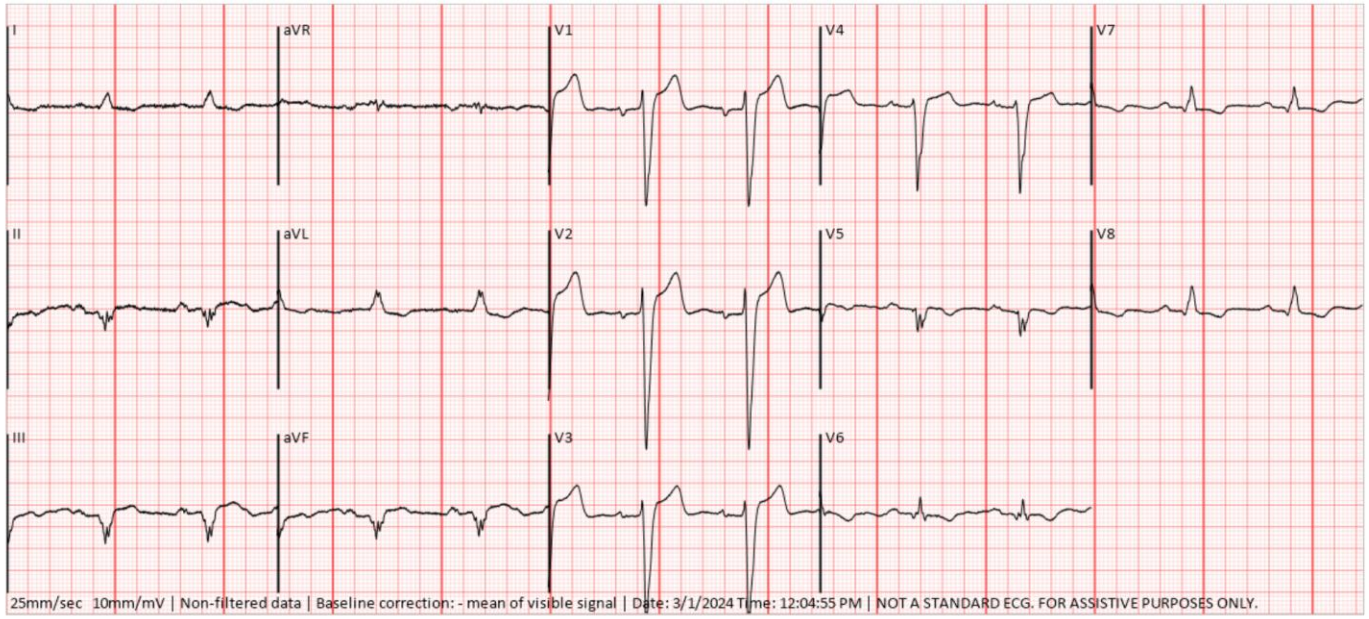


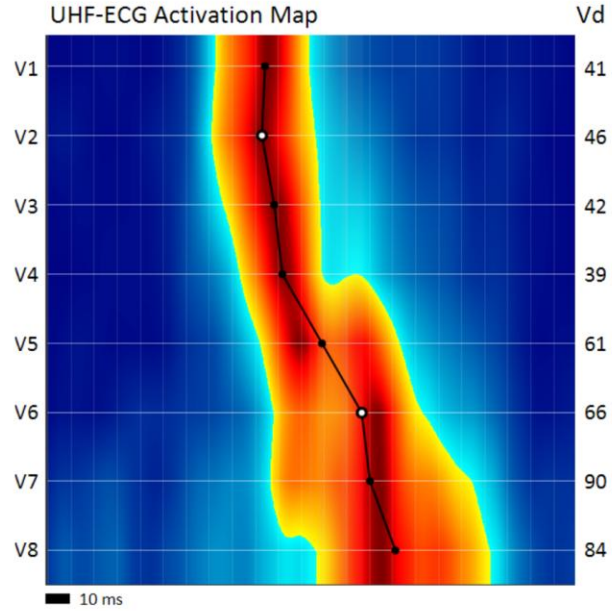
IVCD_2

Intraventricular Conduction Disturbance, VD 49 ms



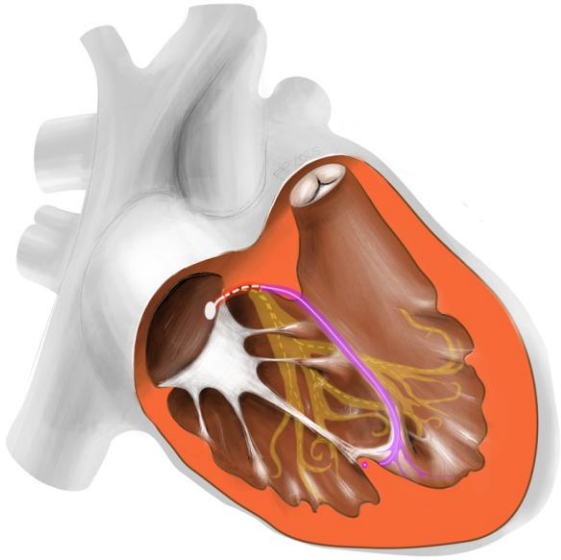


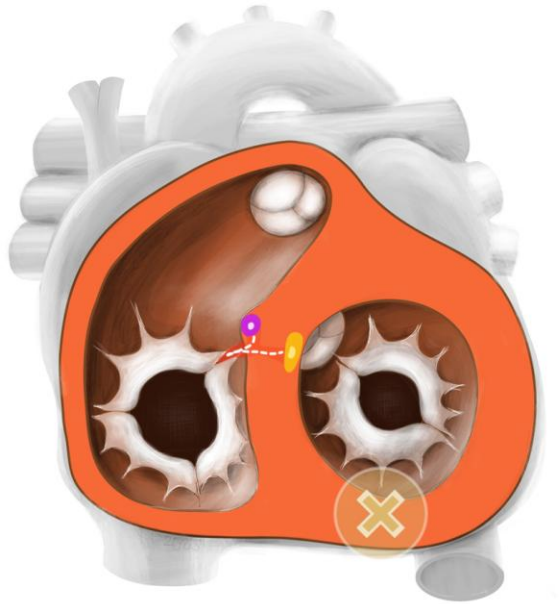




Collection 6: LBBB from IVCD Differentiation Examples (6/6)

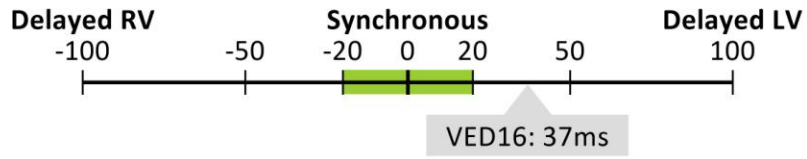
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

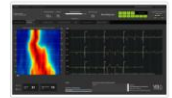


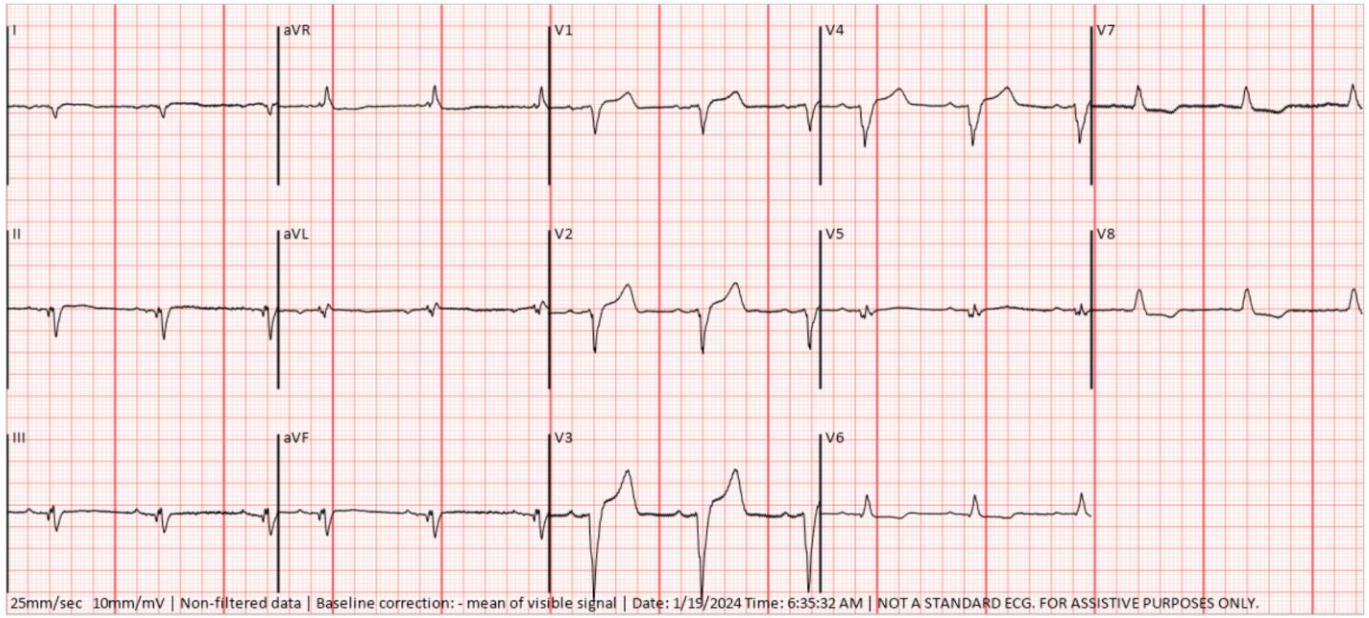


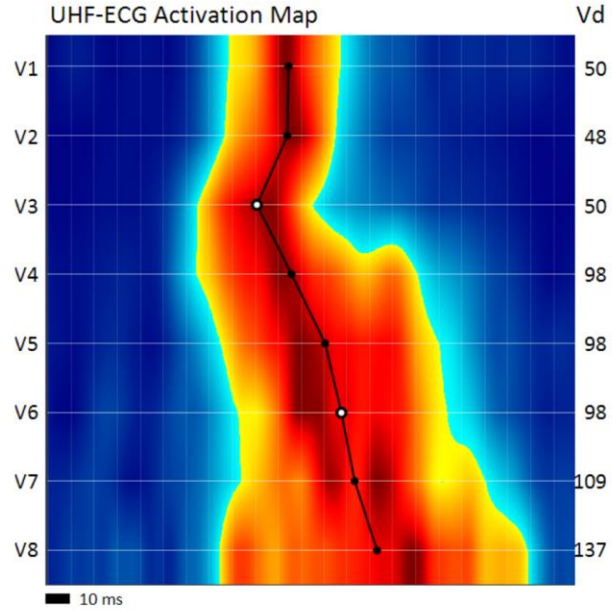
IVCD_3

Intraventricular Conduction Disturbance, VD 74 ms









VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

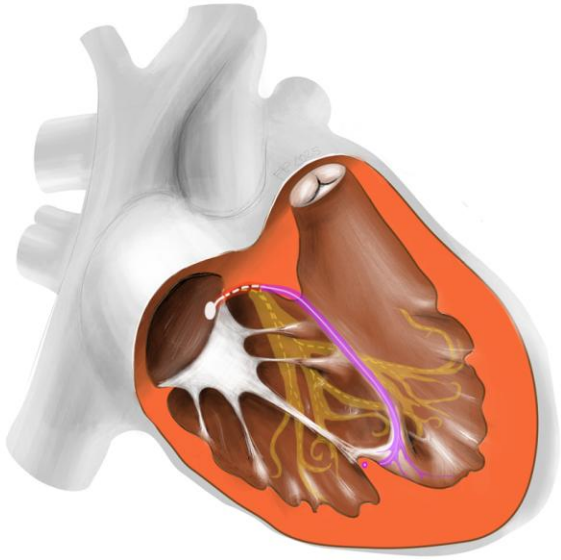
Collection 7

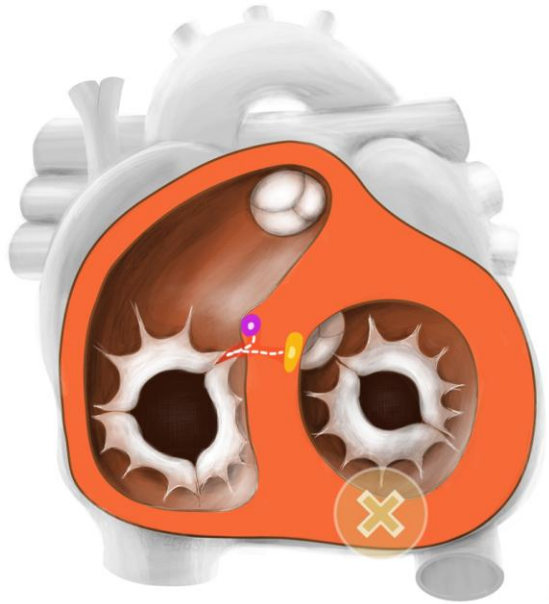
BiV CRT and CSP CRT,

HF patient with IVCD

Collection 7: BiV CRT and CSP CRT in HF patient with IVCD (1/5)

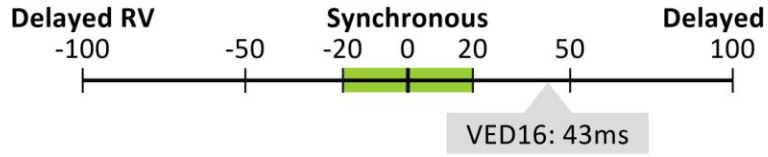
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

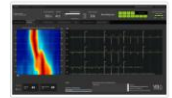


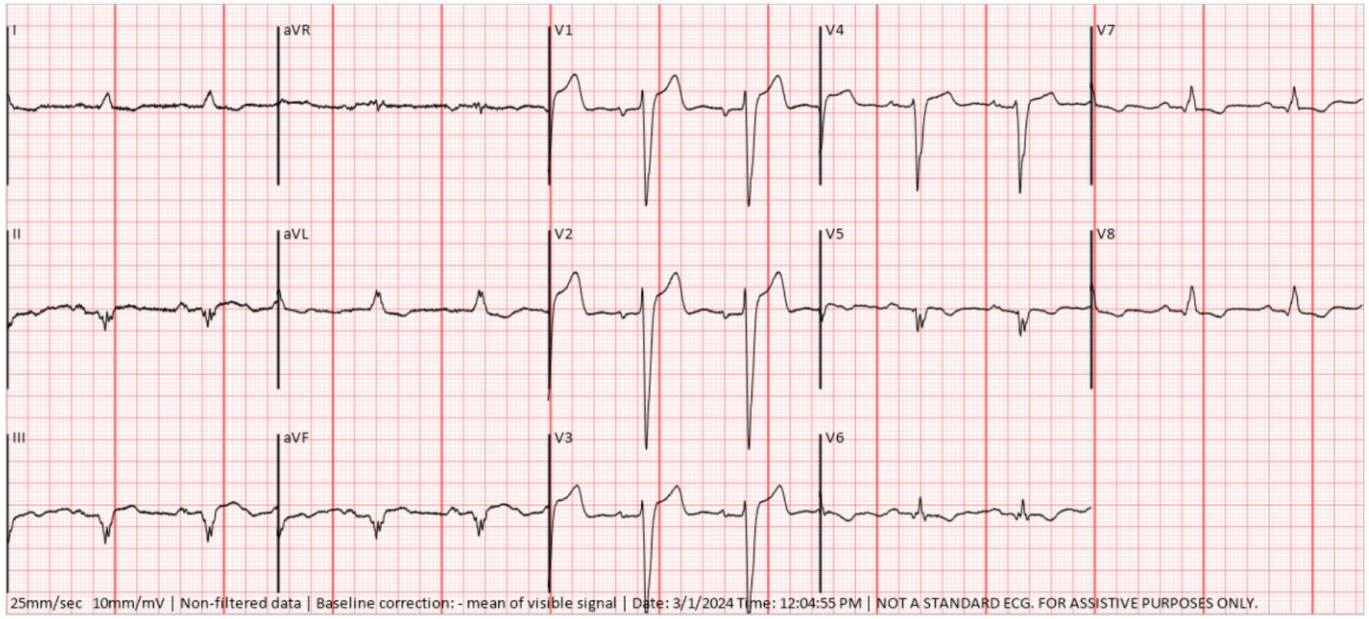


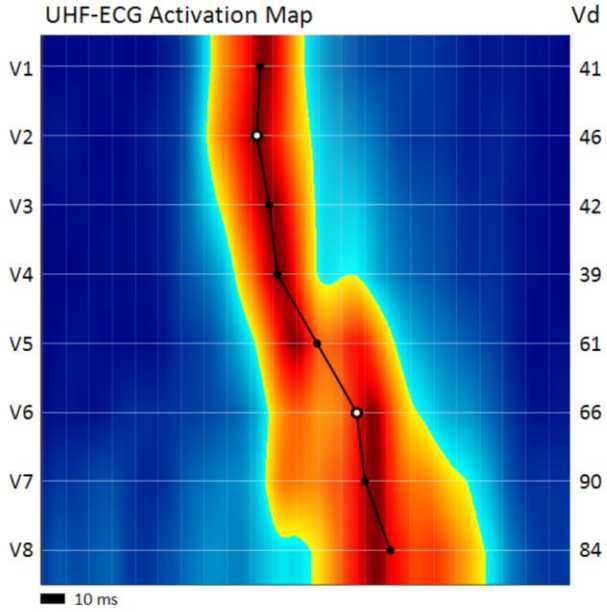
IVCD, spontaneous

Intraventricular Conduction Disturbance, VD 49 ms



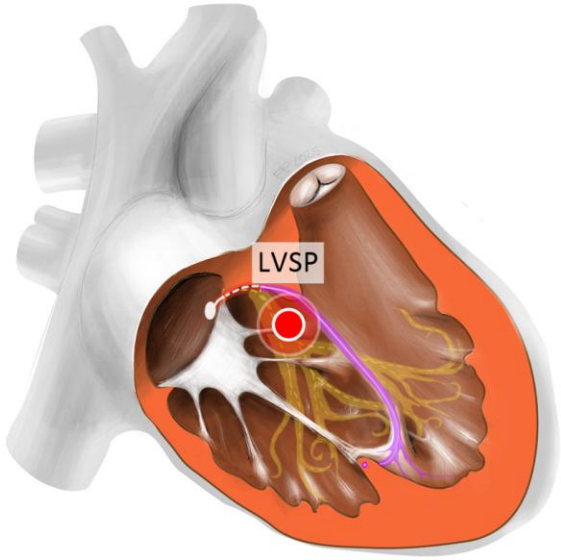


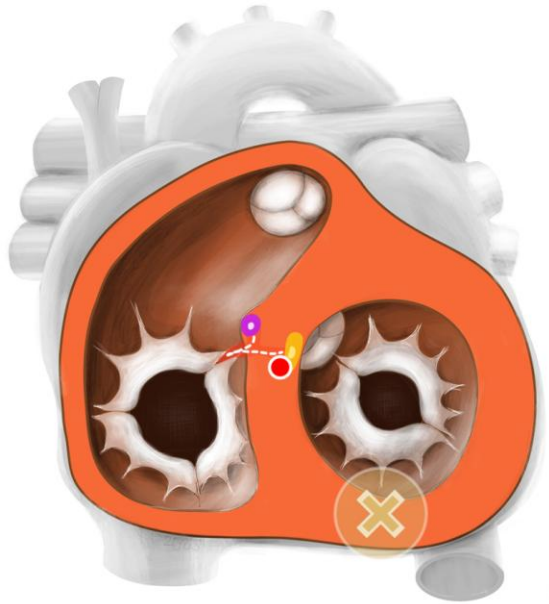




Collection 7: BiV CRT and CSP CRT in HF patient with IVCD (2/5)

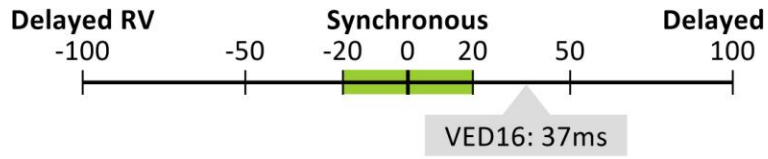
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

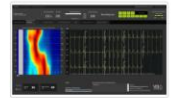


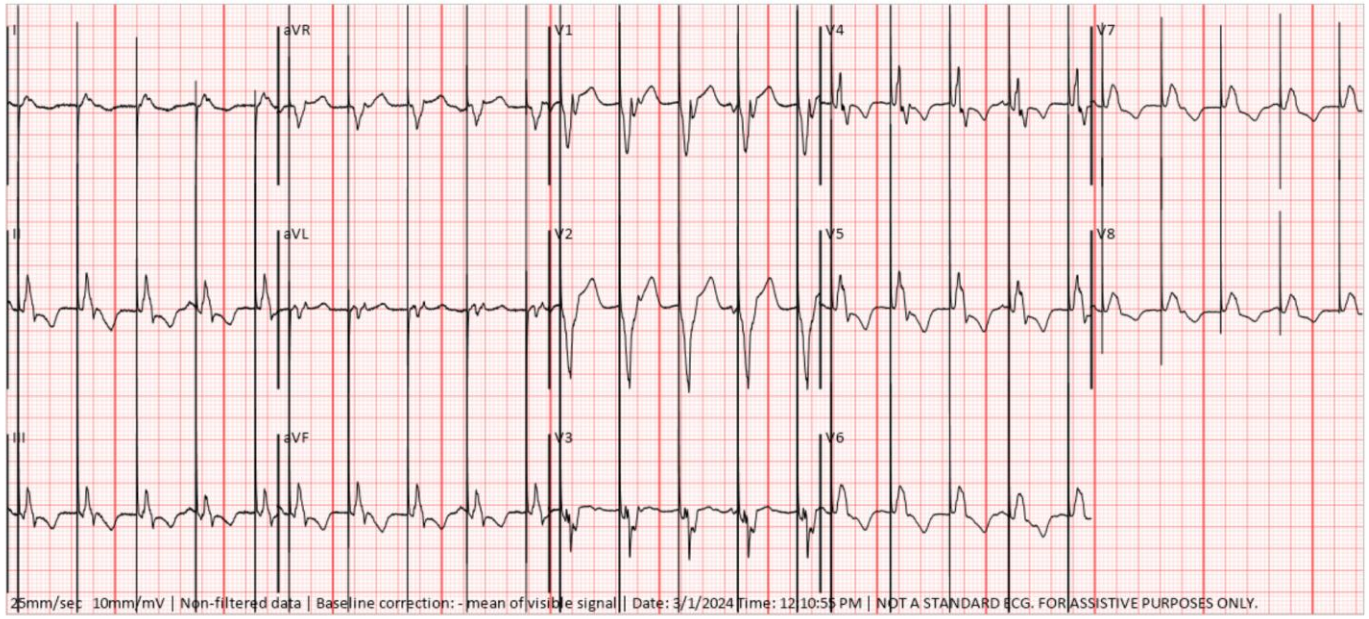


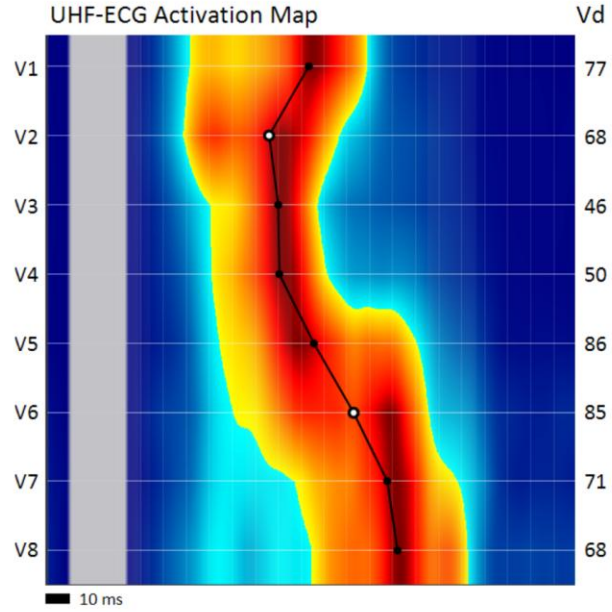
LVSP

Left Ventricular Septal Pacing, VD 69 ms



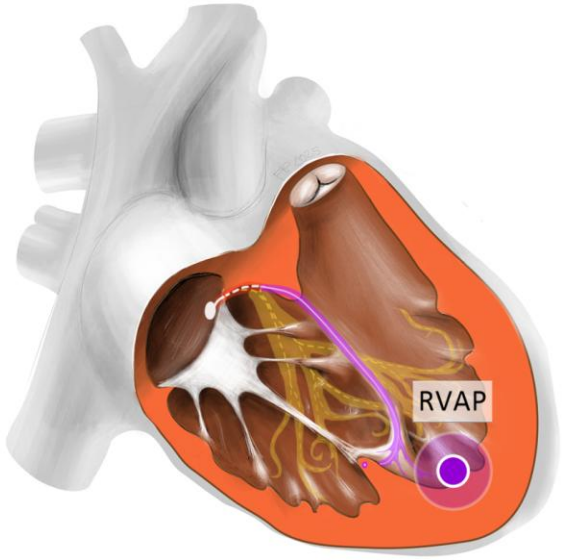


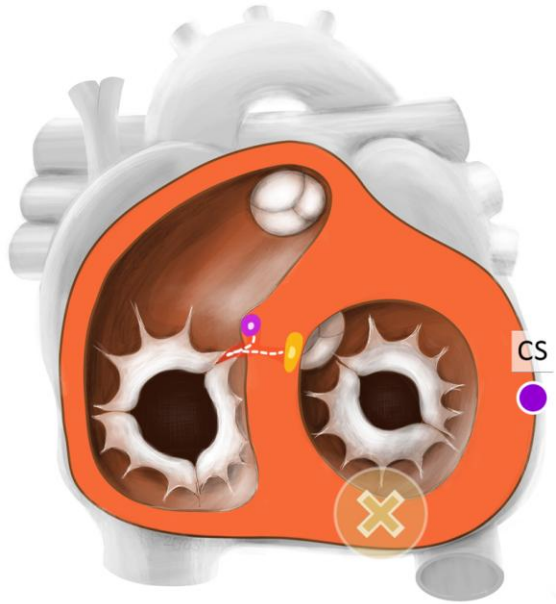




Collection 7: BiV CRT and CSP CRT in HF patient with IVCD (3/5)

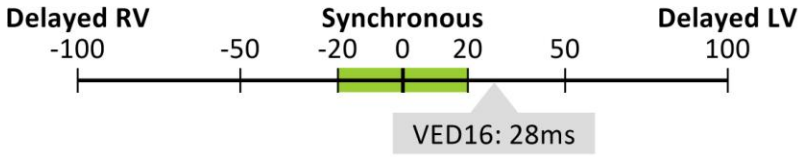
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

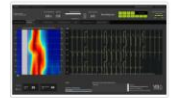


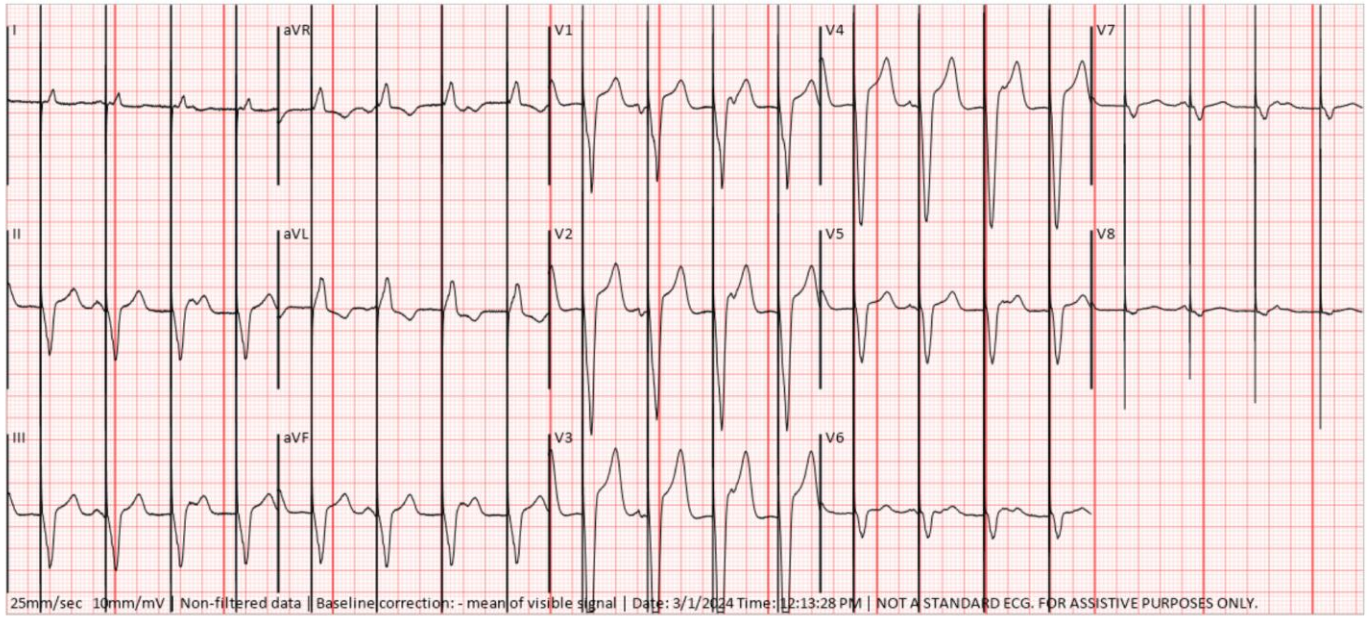


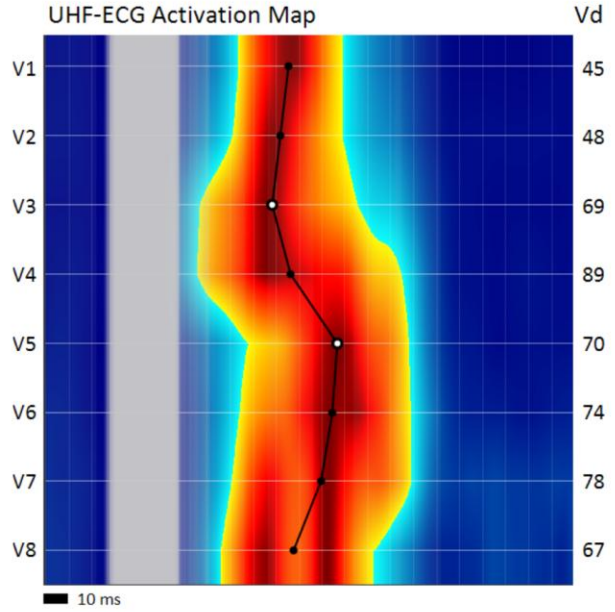
BiVP

Biventricular Pacing, VD 66 ms



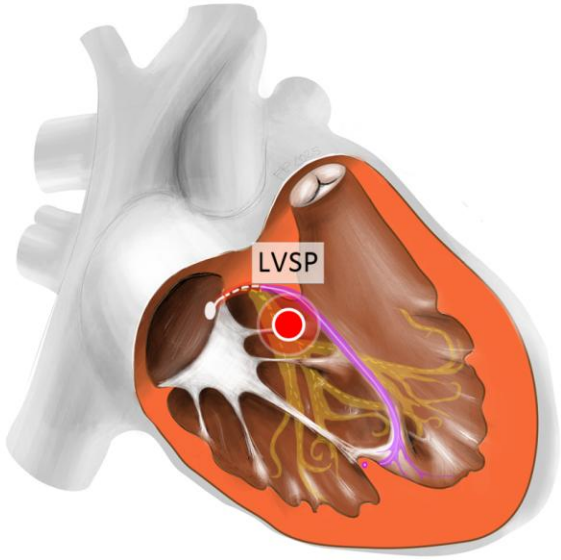


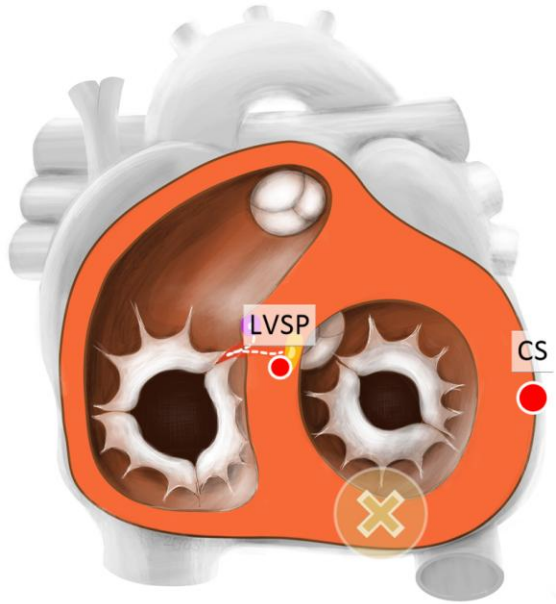




Collection 7: BiV CRT and CSP CRT in HF patient with IVCD (4/5)

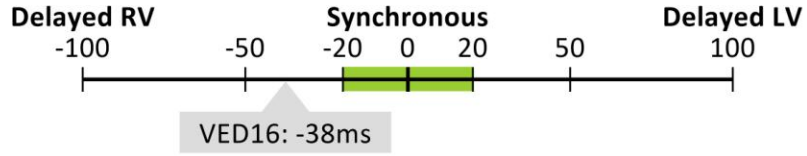
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

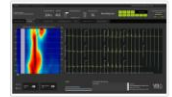


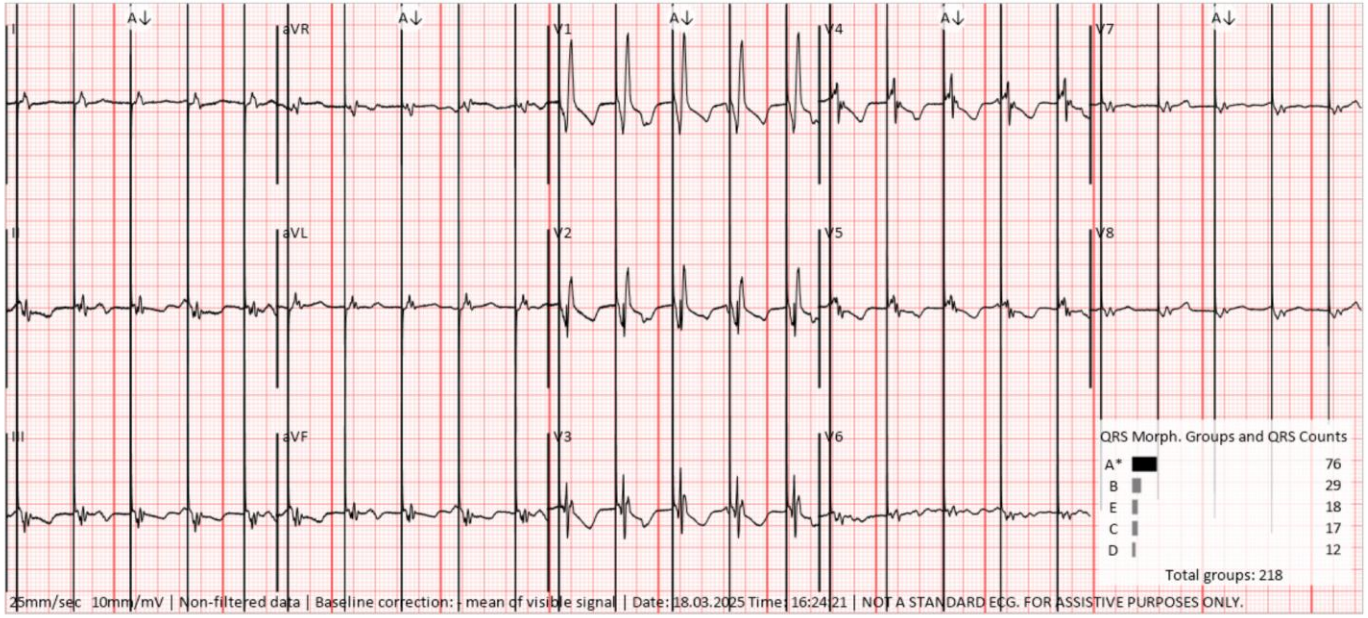


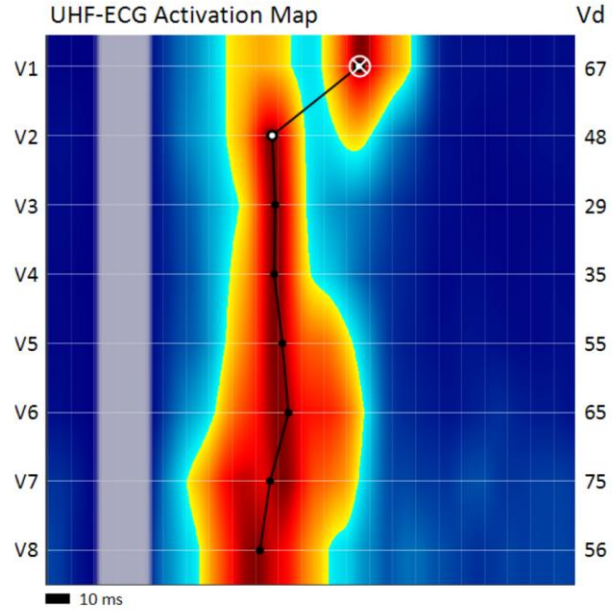
LOT CRT

Left Bundle Branch-optimized Cardiac Resynchronization, VD 50 ms



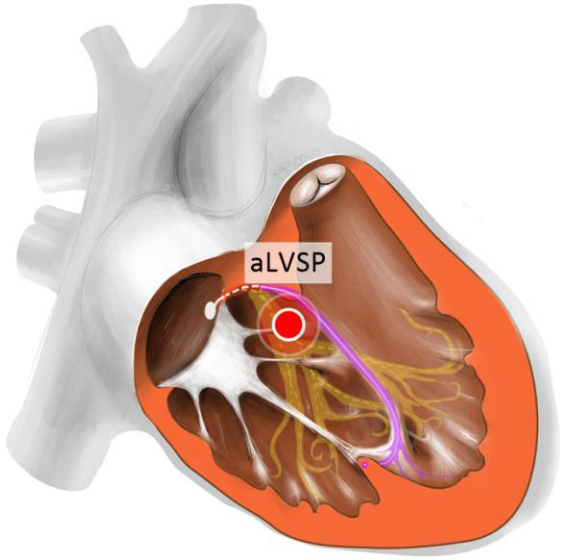


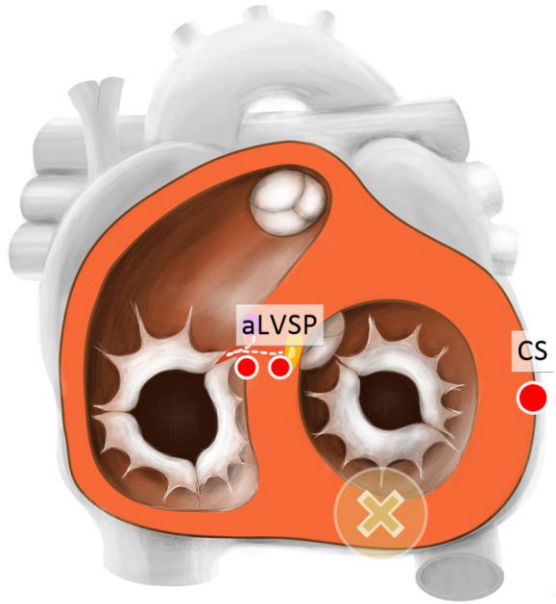




Collection 7: BiV CRT and CSP CRT in HF patient with IVCD (5/5)

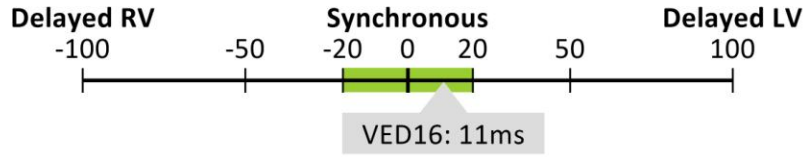
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

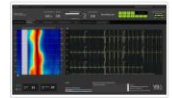


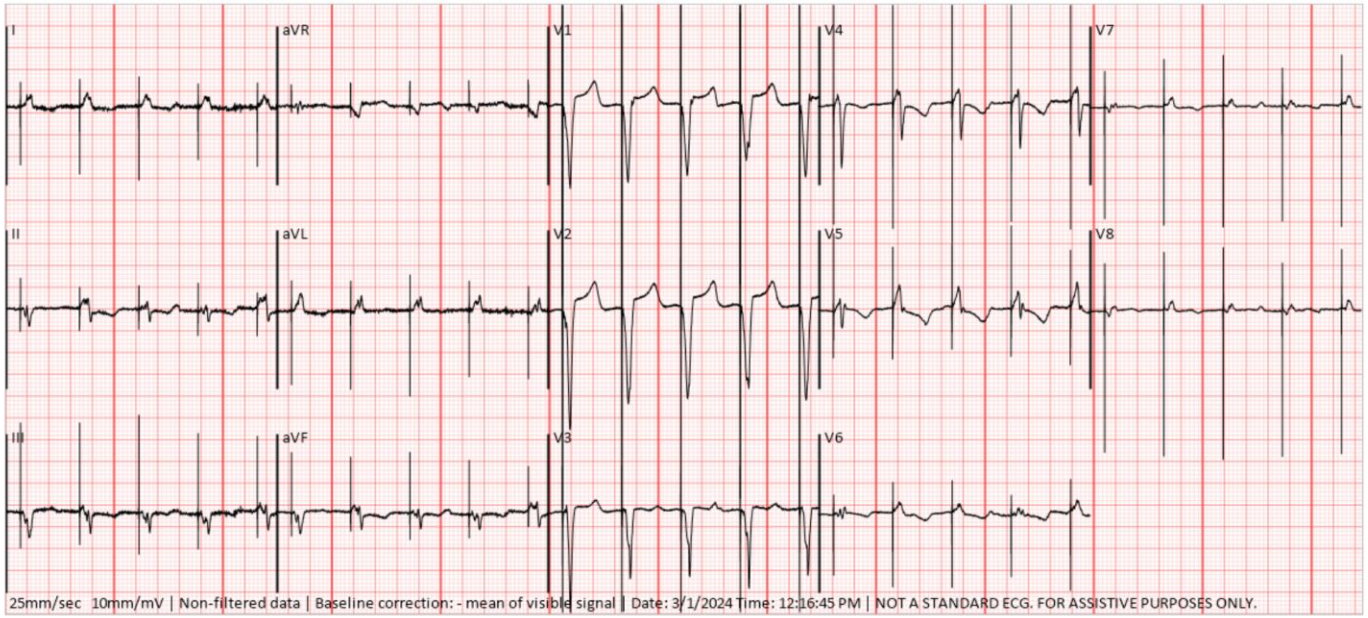


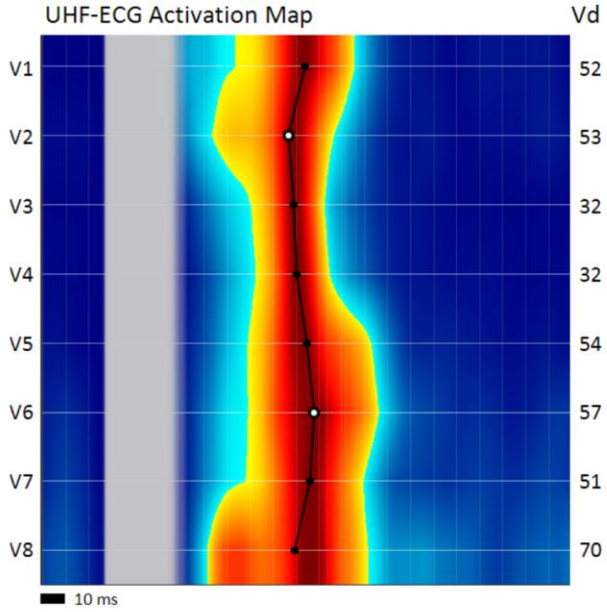
anodal LOT CRT

Left Bundle Branch-optimized Cardiac Resynchronization, VD 47 ms









VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

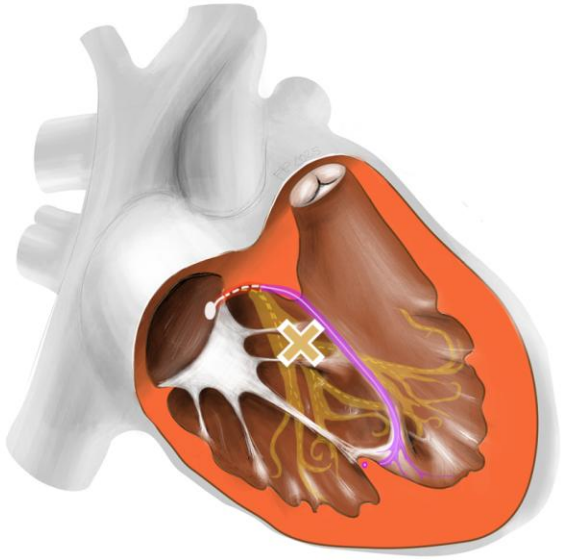
Collection 8

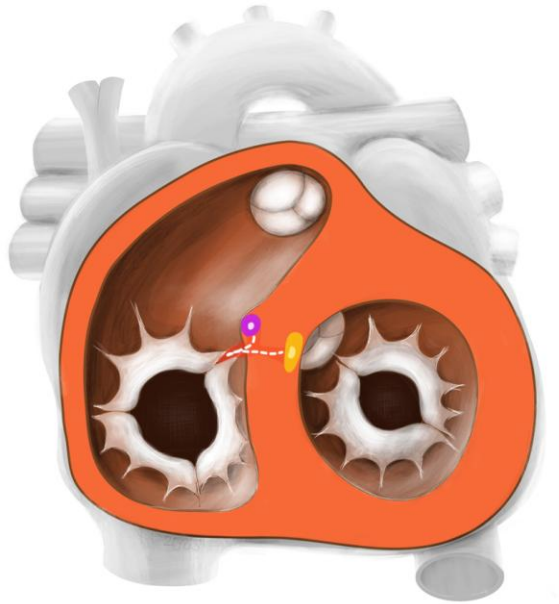
BiV CRT

HF patient with LBBB

Collection 8: BiV CRT in HF patient with LBBB (1/4)

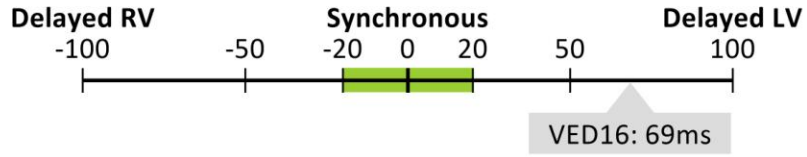
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

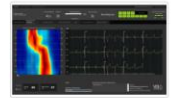


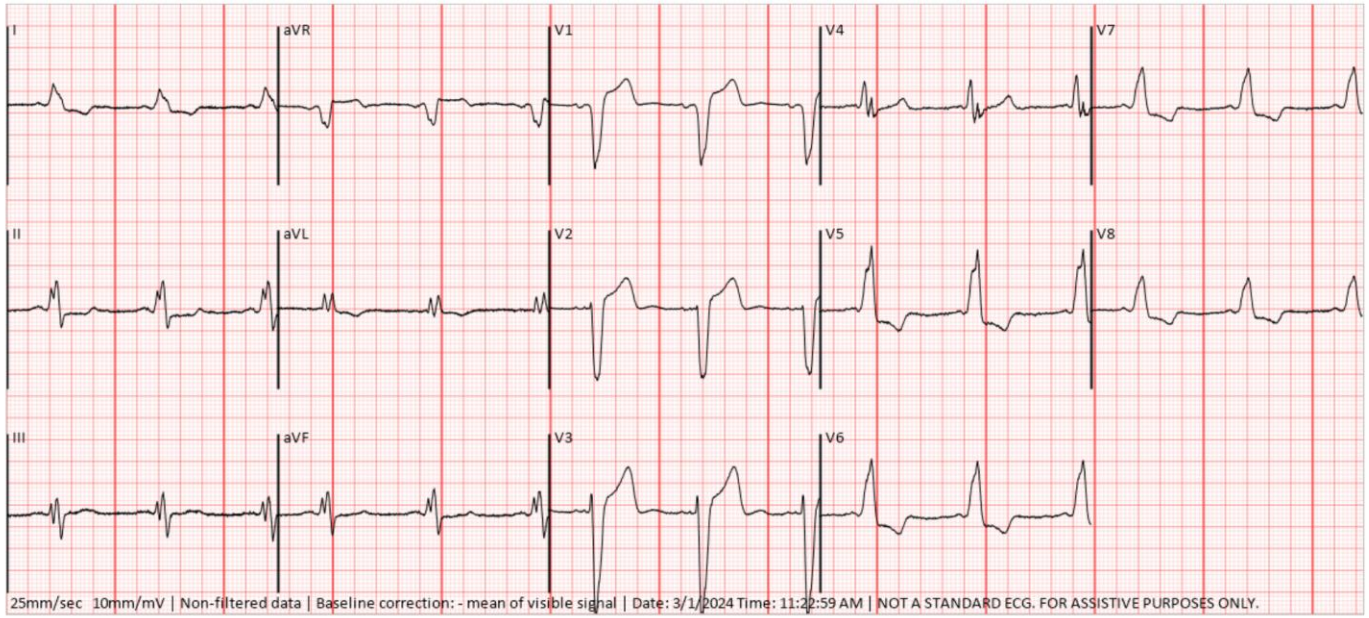


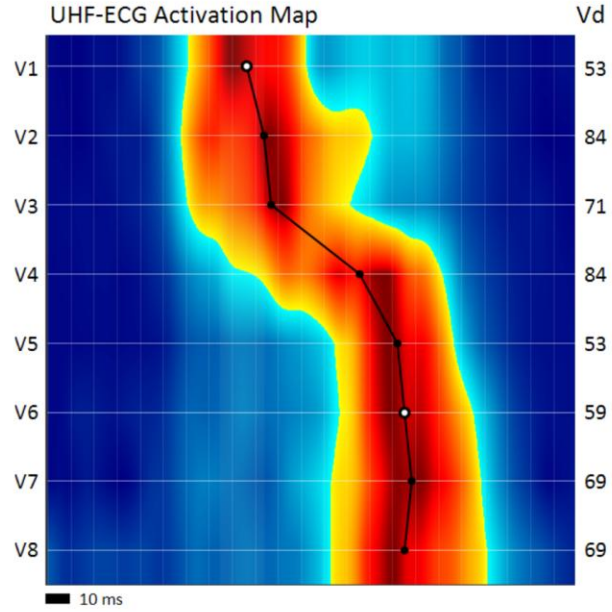
LBBB

Left Bundle Branch Block, VD 67 ms



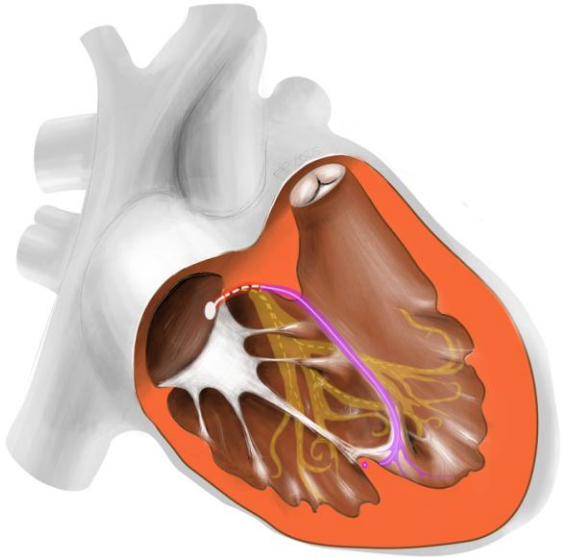


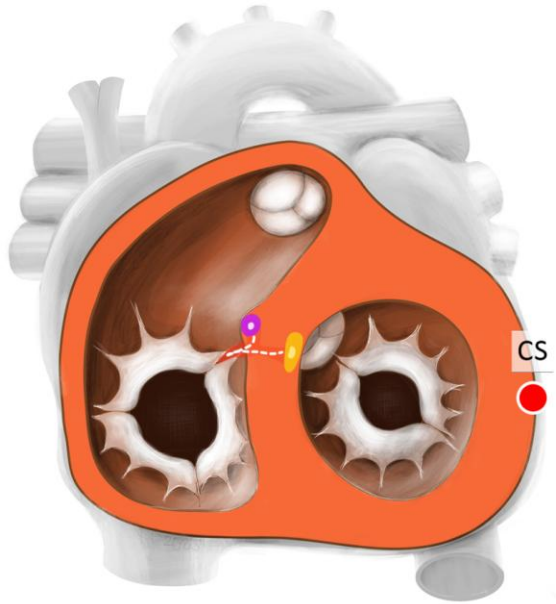




Collection 8: BiV CRT in HF patient with LBBB (2/4)

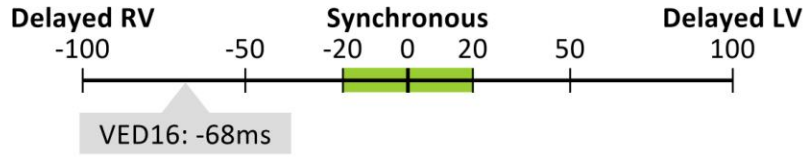
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

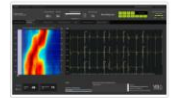


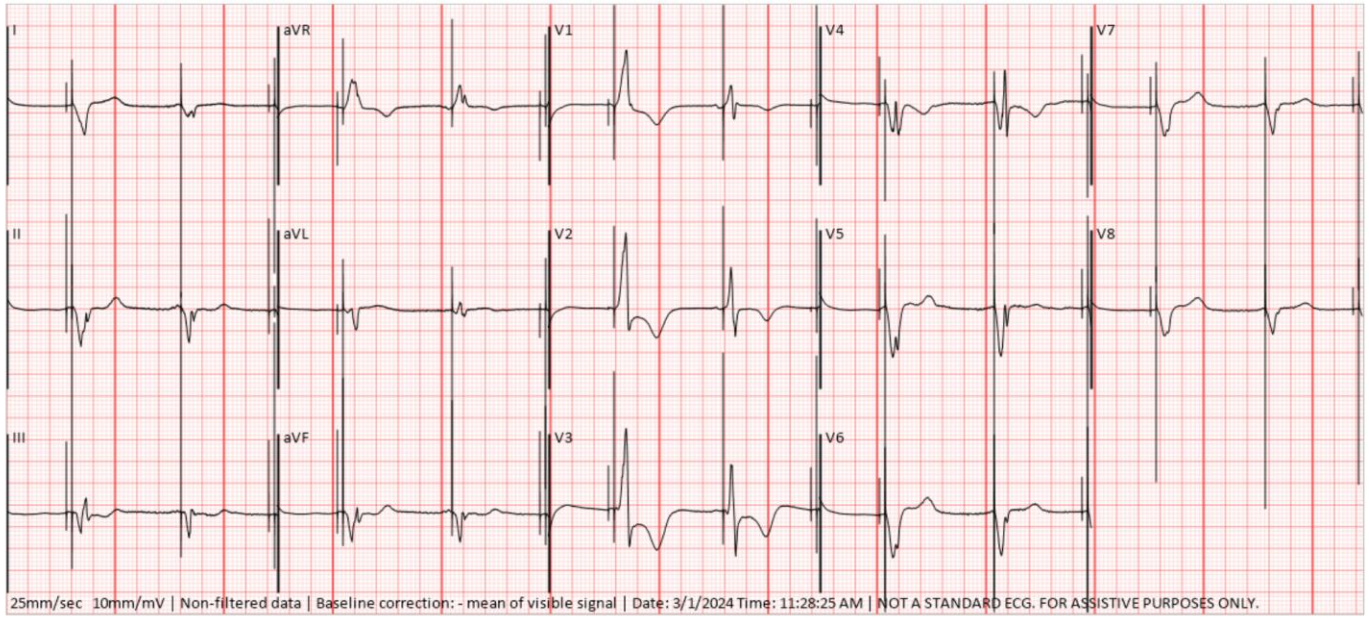


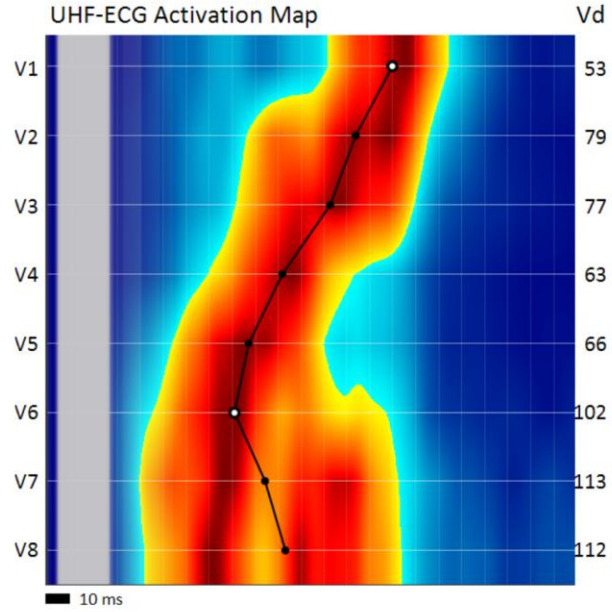
LV only

LV Coronary Sinus Pacing, VD 73 ms



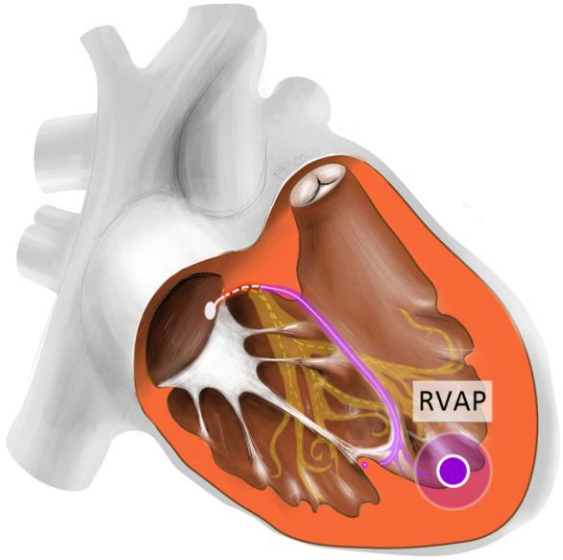


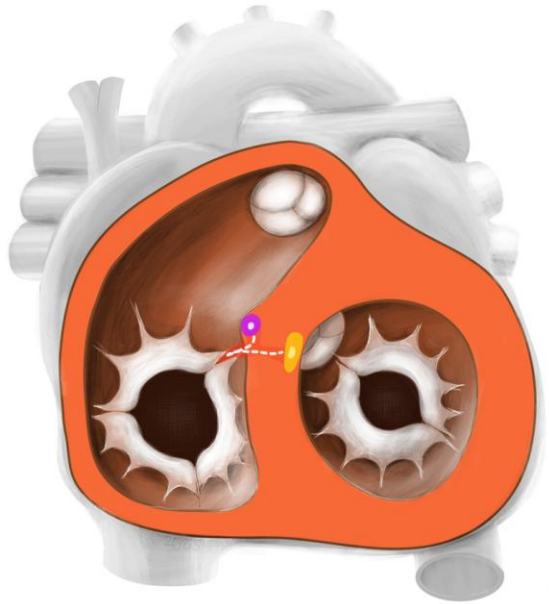




Collection 8: BiV CRT in HF patient with LBBB (3/4)

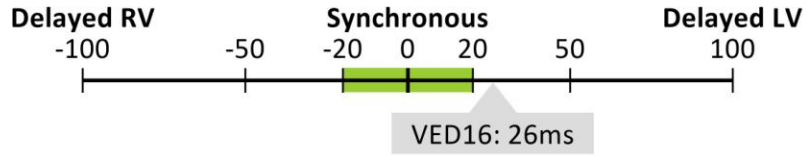
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

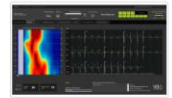


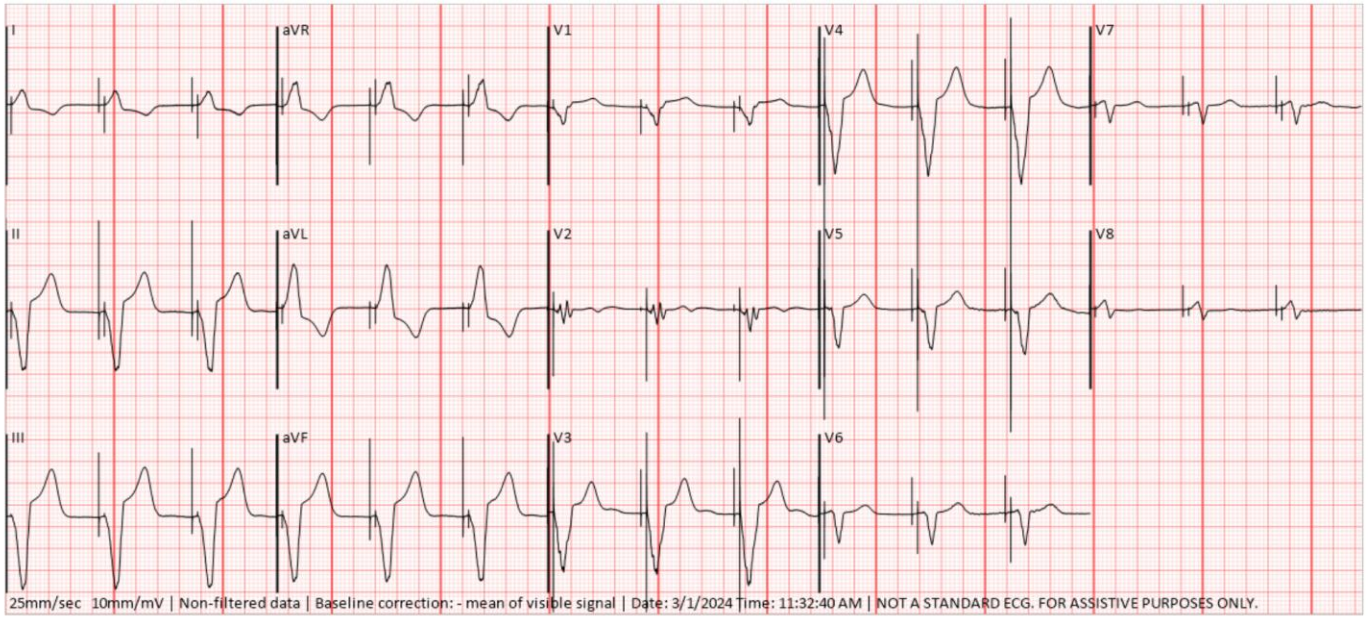


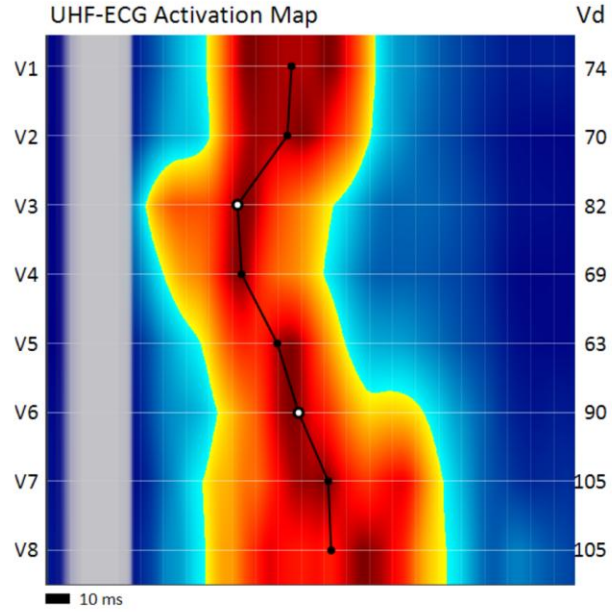
RV only - RVAP

Right Ventricular Apical Pacing, VD 75 ms



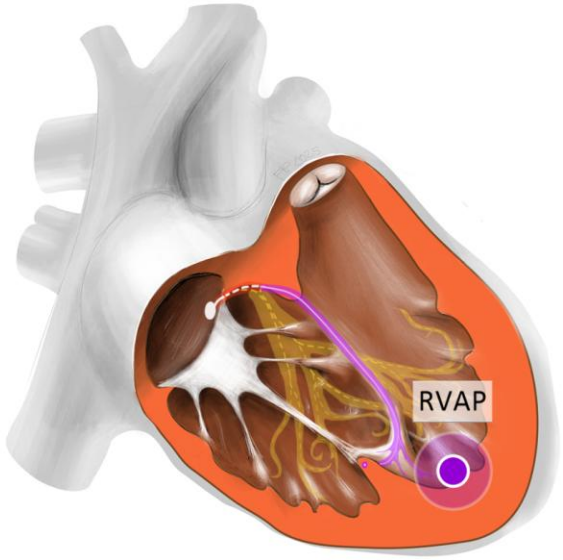


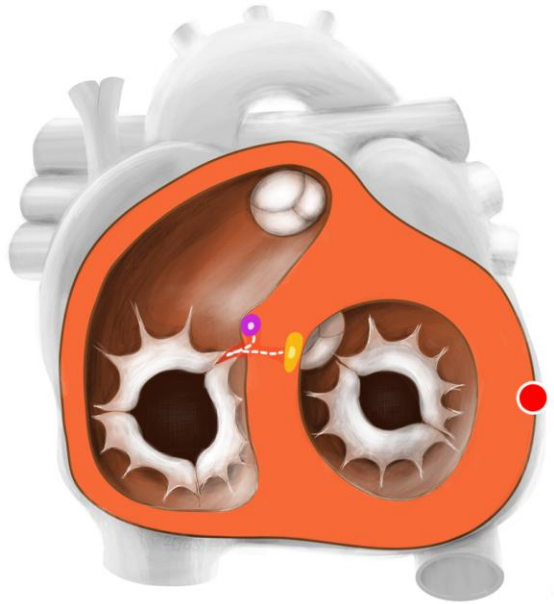




Collection 8: BiV CRT in HF patient with LBBB (4/4)

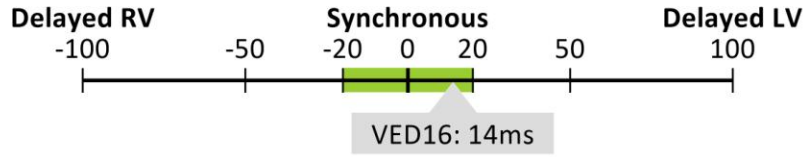
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

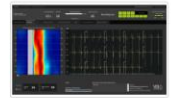


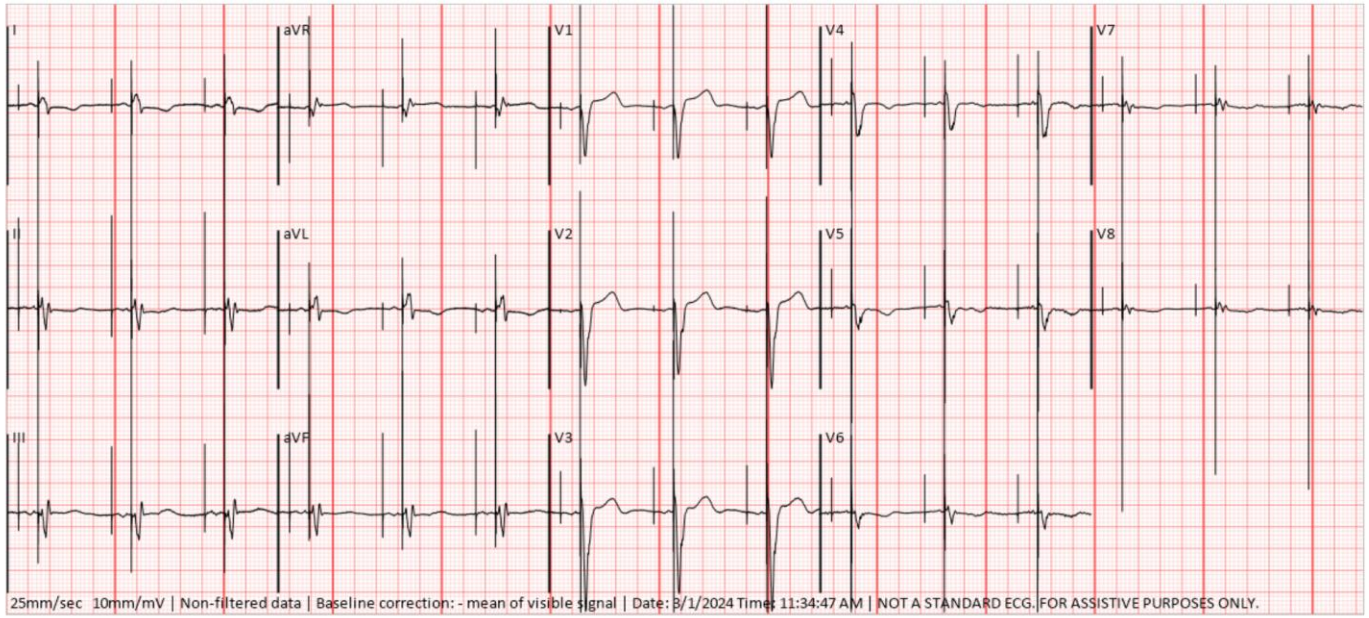


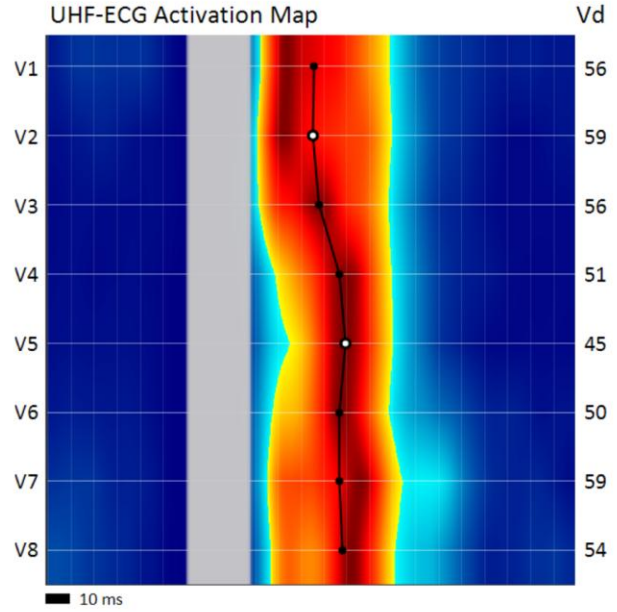
BiVP

Biventricular Pacing, VD 53 ms









VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

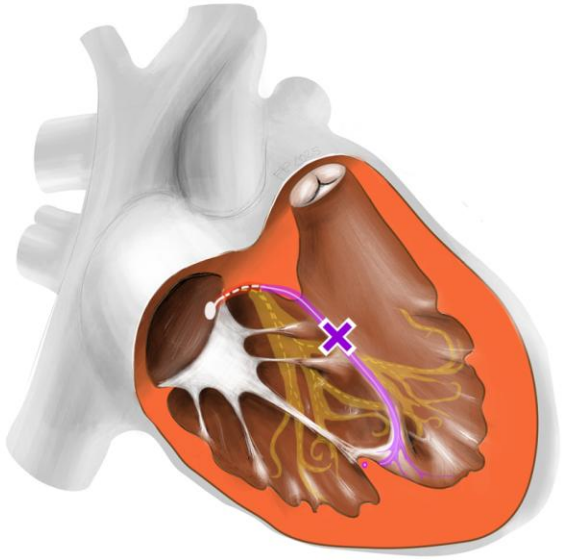
Collection 9

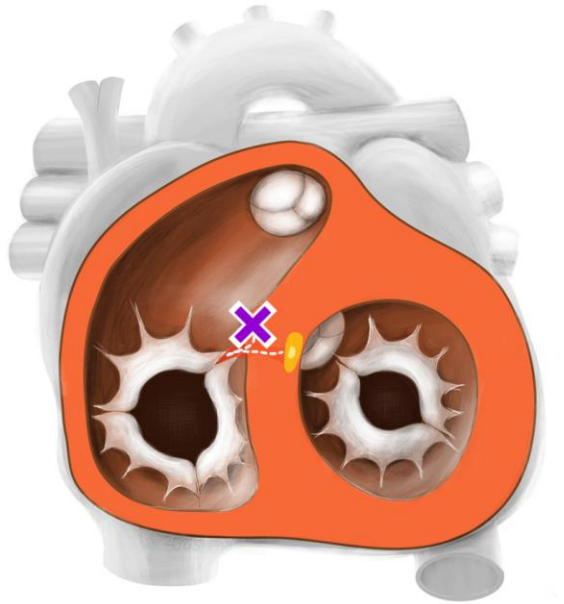
BiV CRT

RBBB patient

Collection 9: BiV CRT in RBBB patient (1/4)

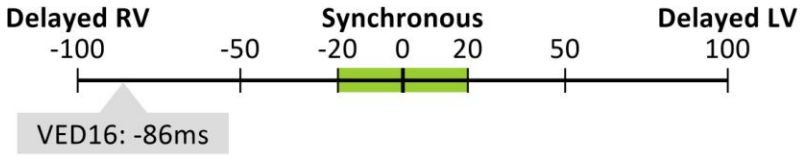
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

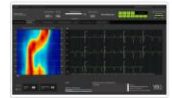


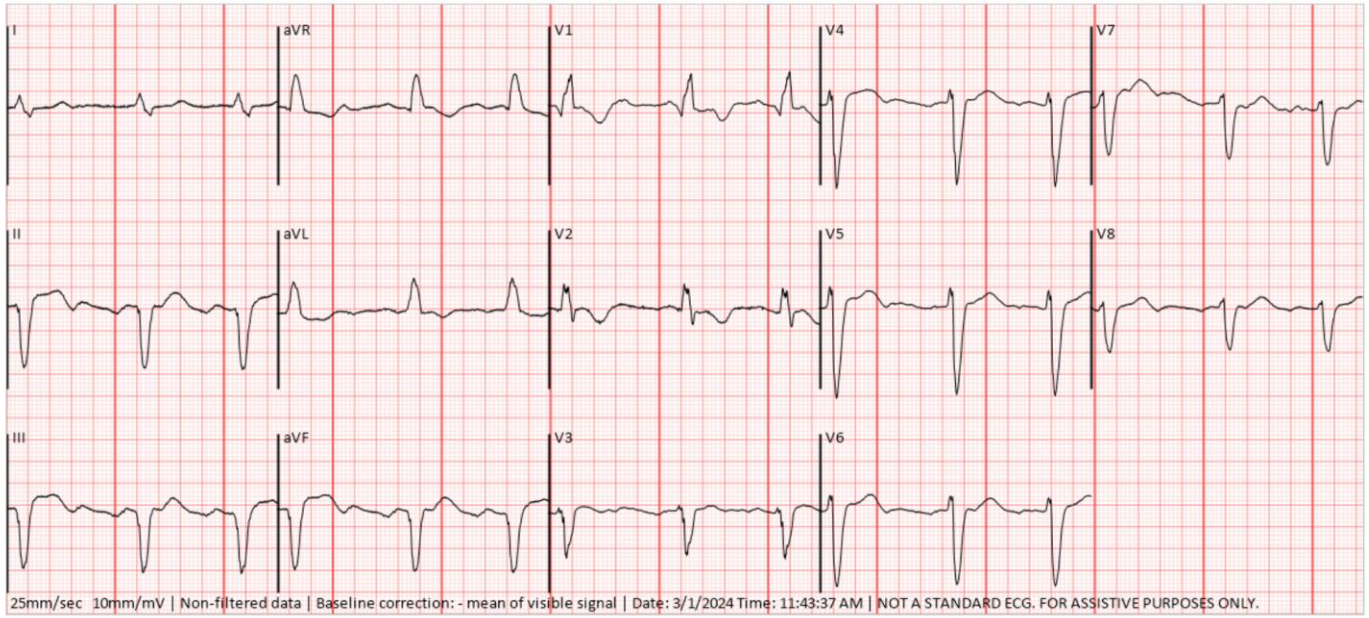


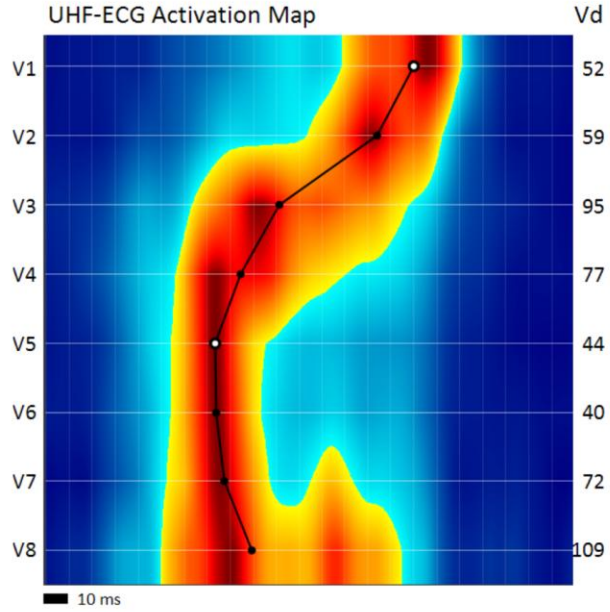
RBBB

Right Bundle Branch Block, VD 61 ms



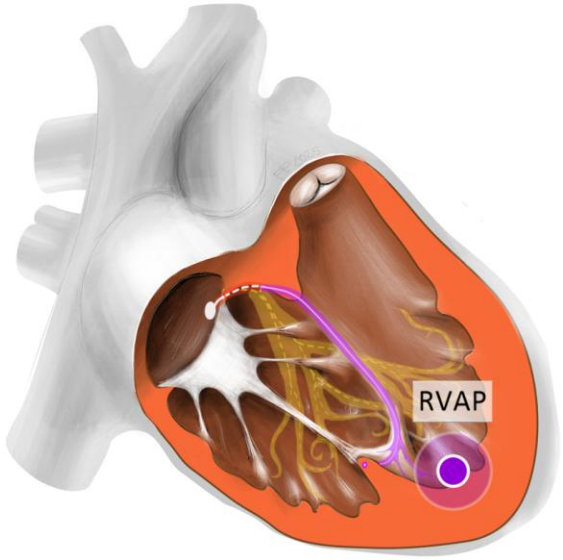


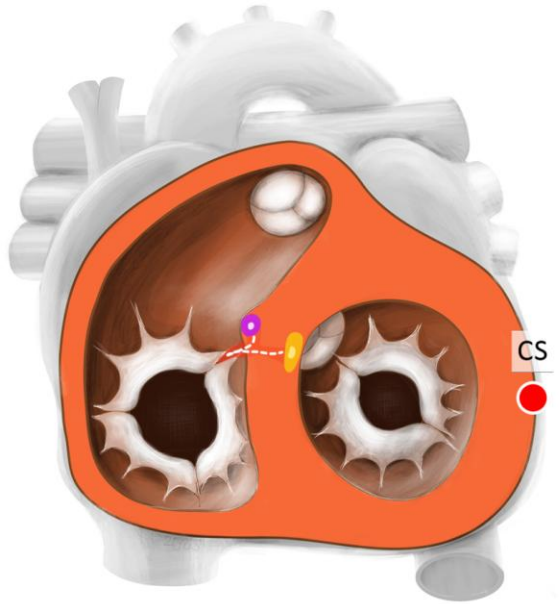




Collection 9: BiV CRT in RBBB patient (2/4)

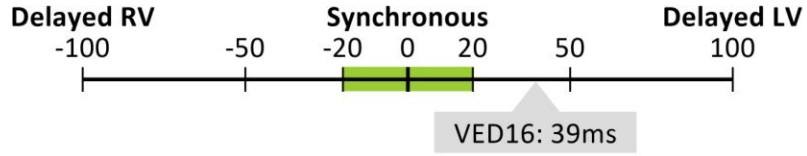
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

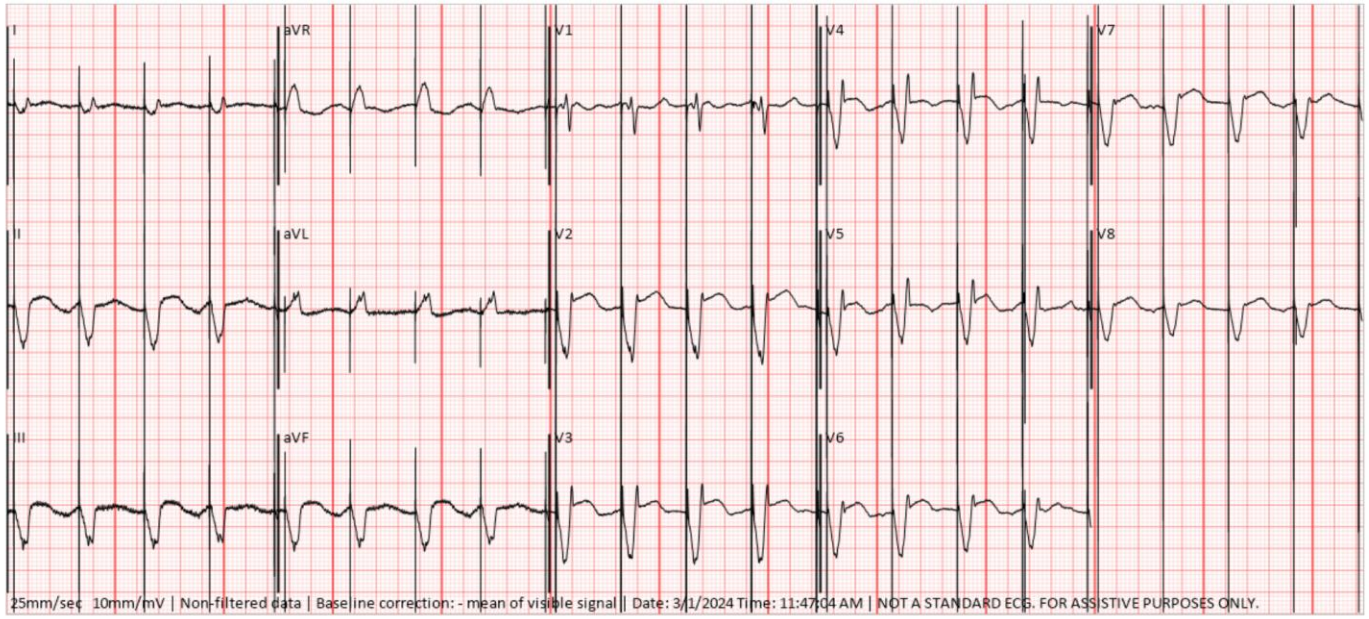


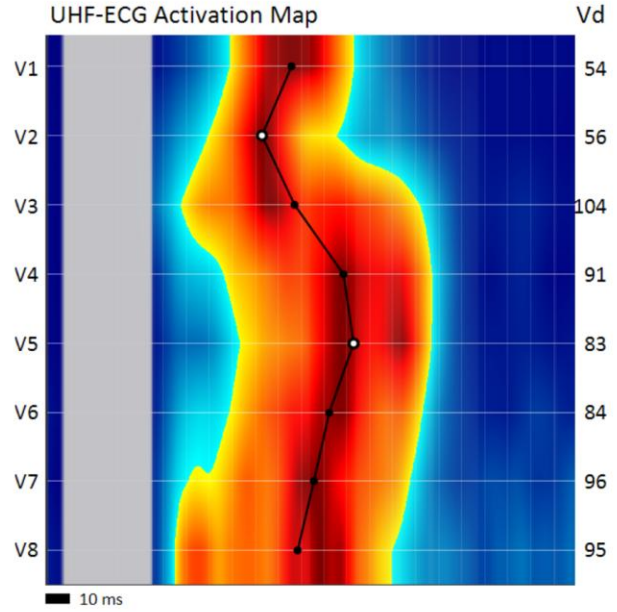


BiVP

Biventricular Pacing, VD 79 ms

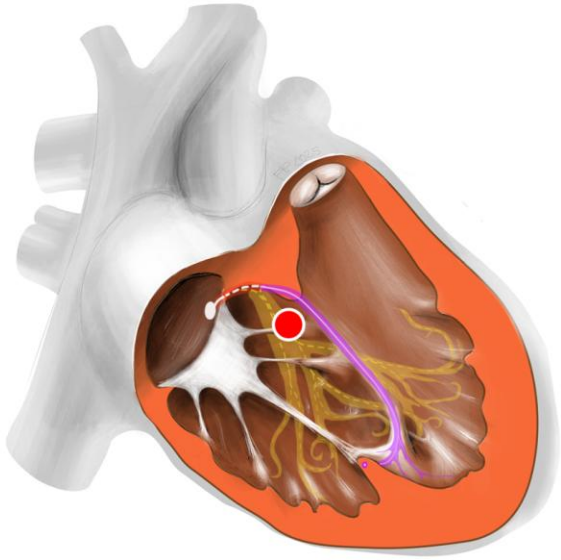


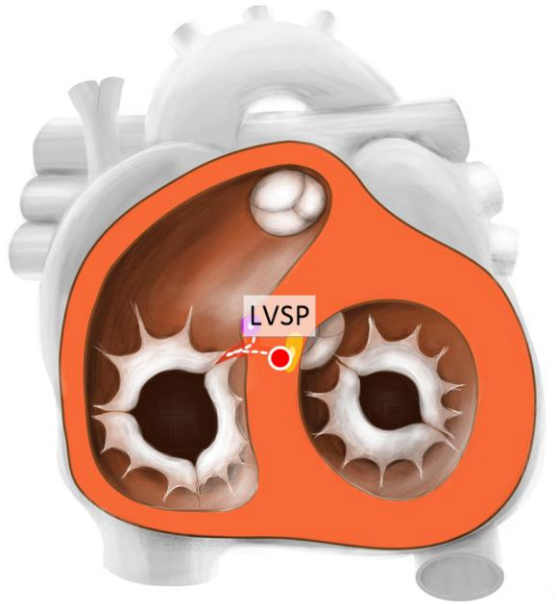




Collection 9: BiV CRT in RBBB patient (3/4)

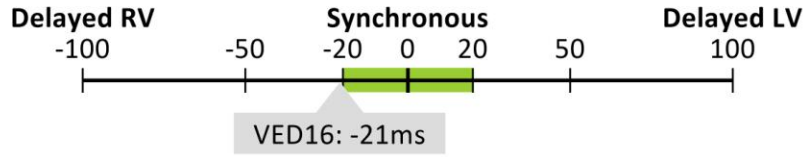
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

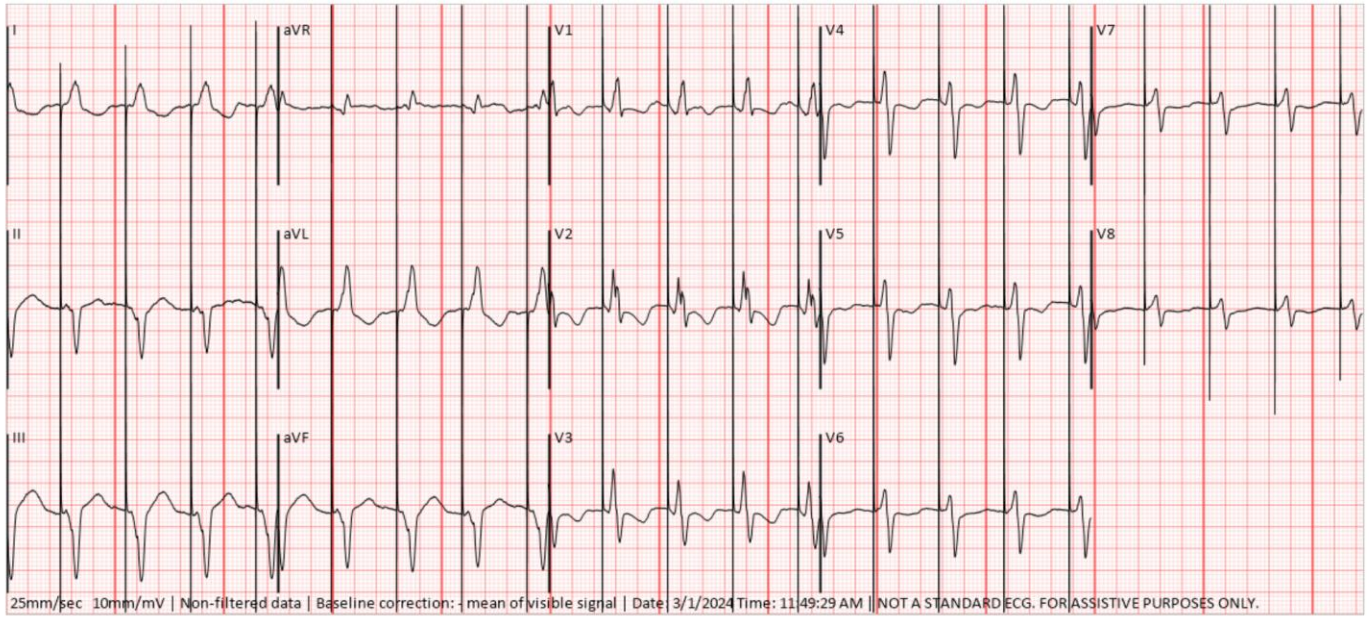


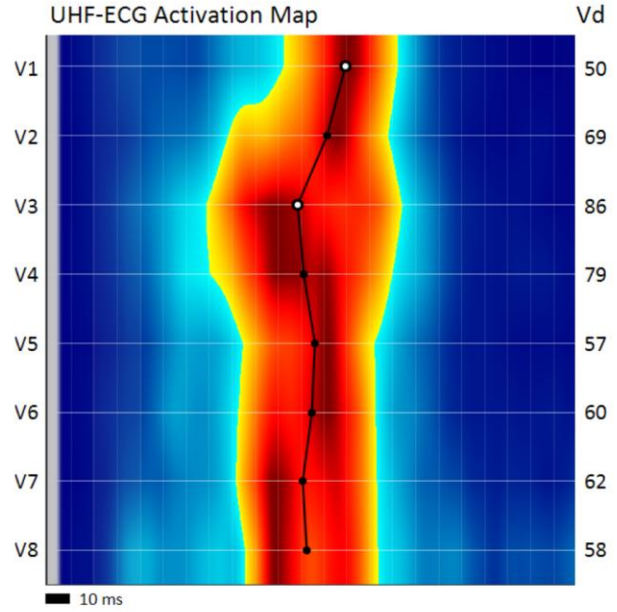


LVSP_1

Left Ventricular Septal Pacing, VD 67 ms

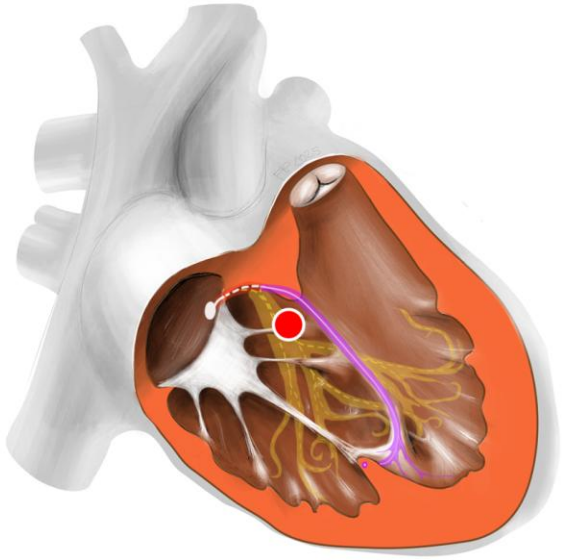


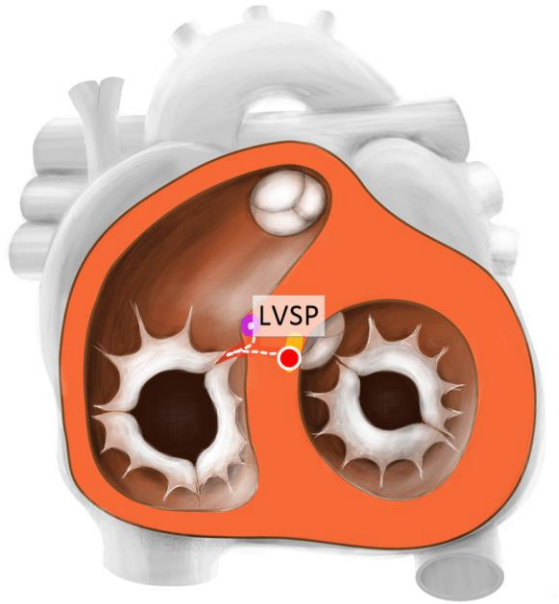




Collection 9: BiV CRT in RBBB patient (4/4)

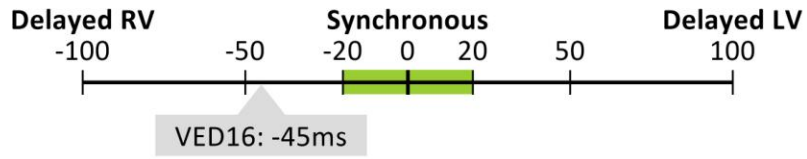
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

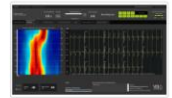


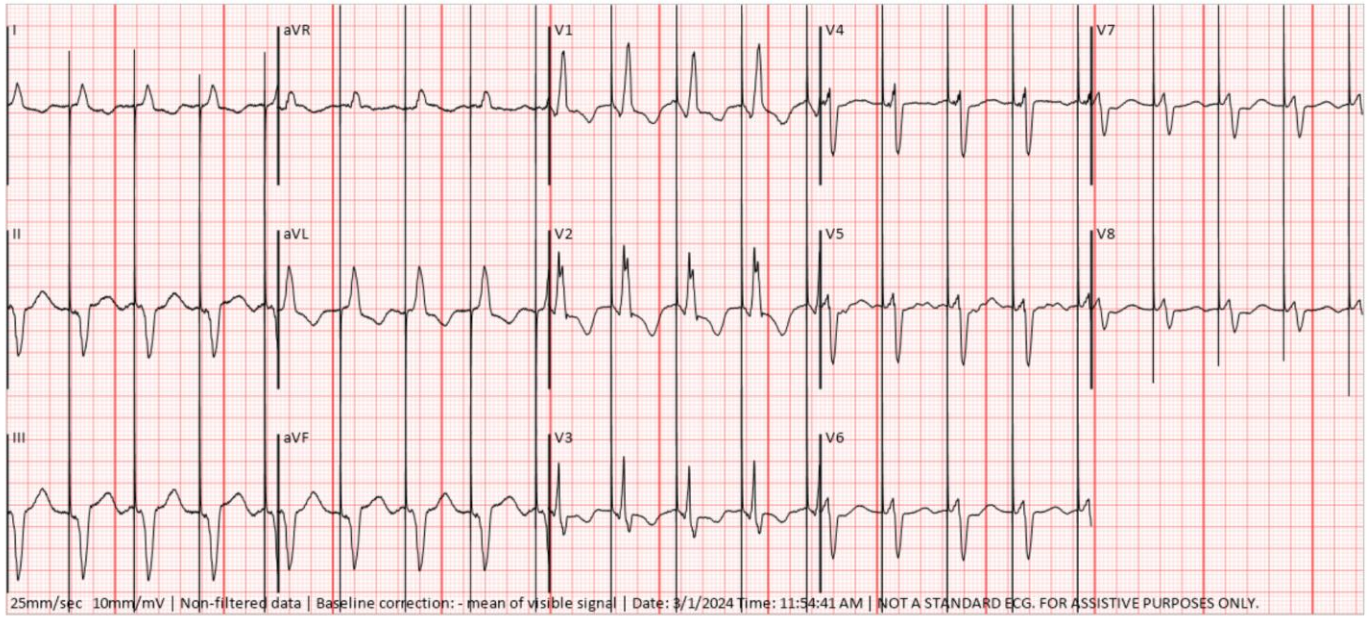


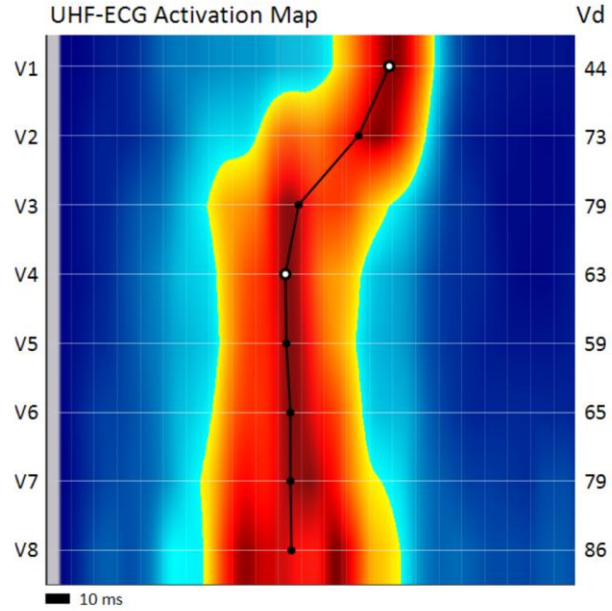
LVSP_2

Left Ventricular Septal Pacing, VD 64 ms









VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

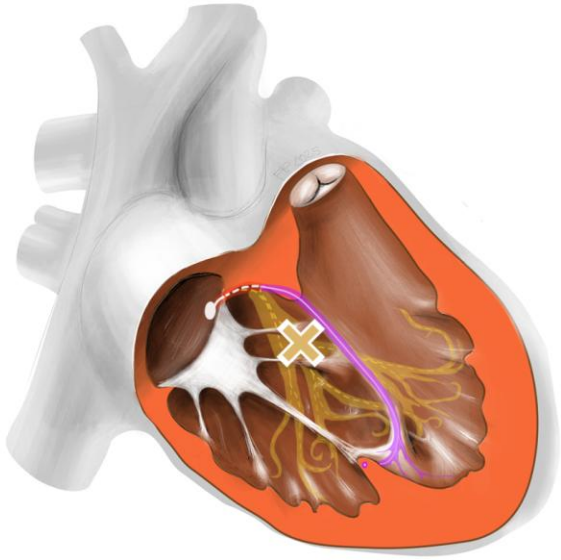
Collection 10

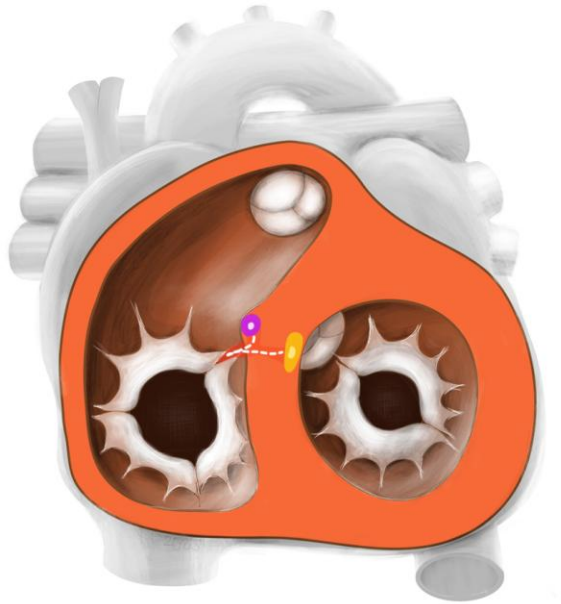
BiV CRT AV delay and VV delay Optimisation

Single patient

Collection 10: BiV AVD VVD Optimisation (1/7)

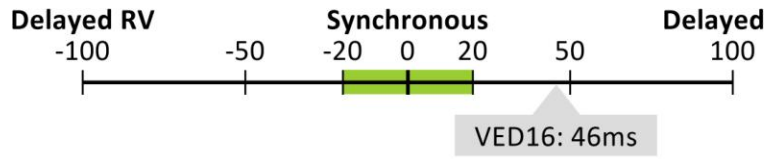
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

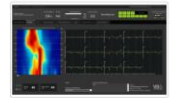


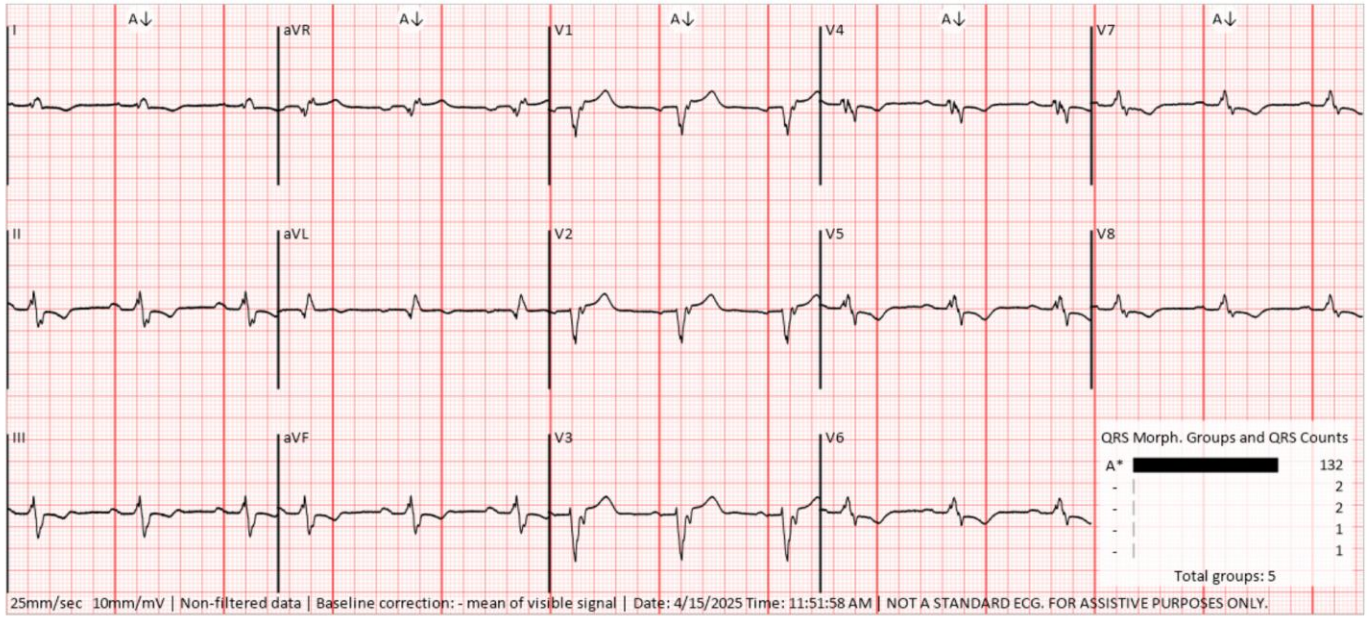


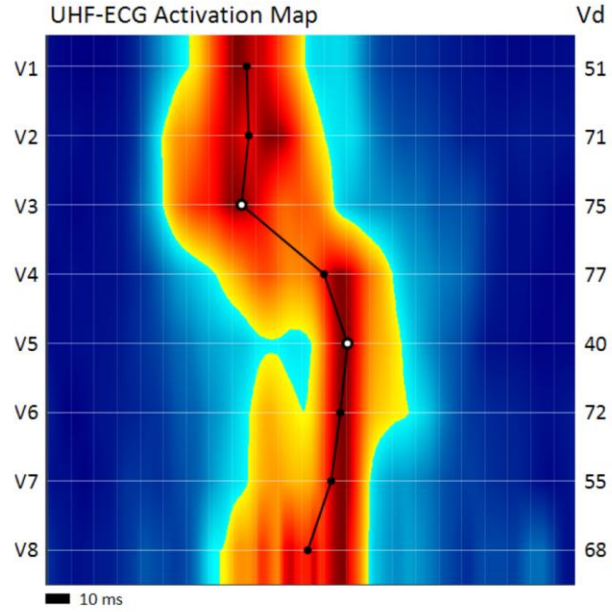
SPONT

Spontaneous activation, Mean VD16 64 ms



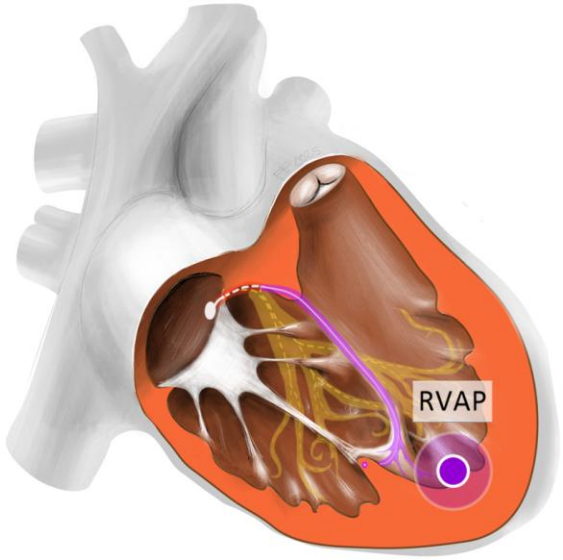


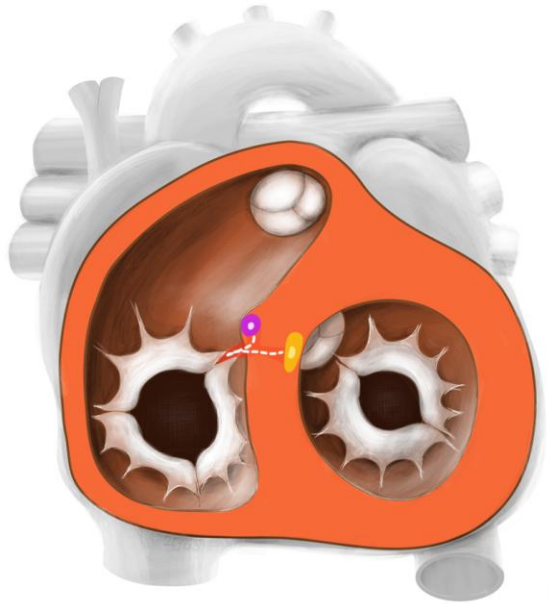




Collection 10: BiV AVD VVD Optimisation (2/7)

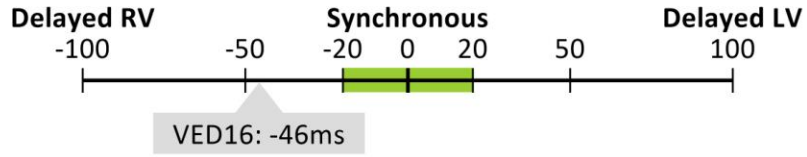
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

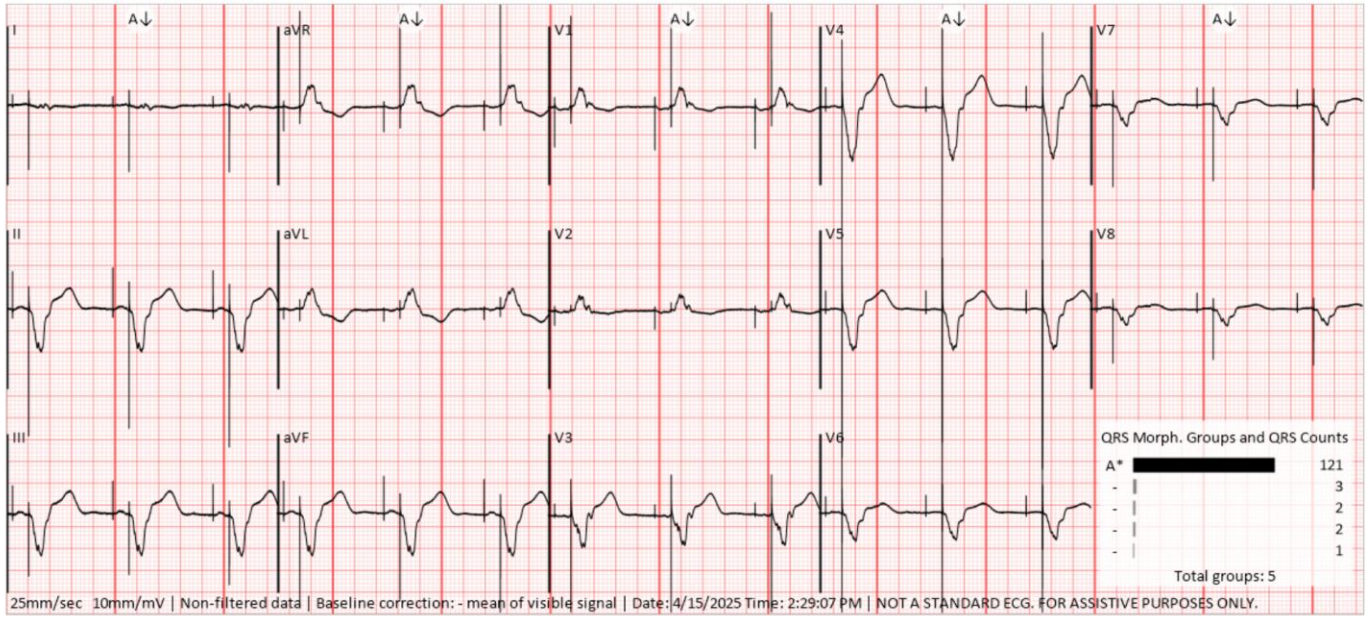


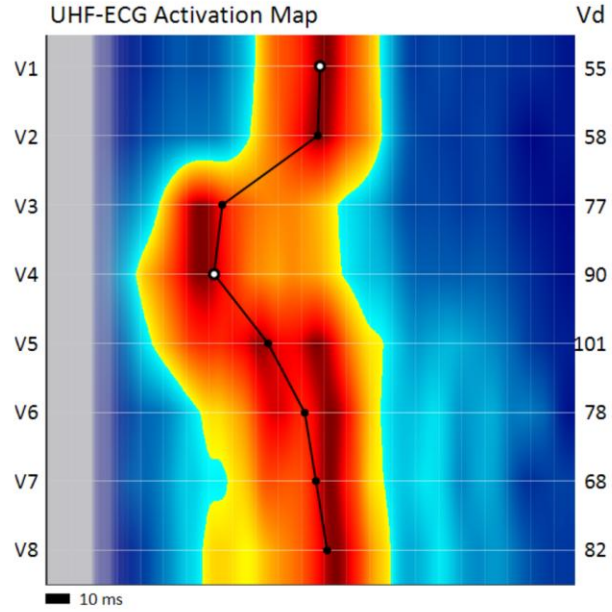


RV only - RVAP

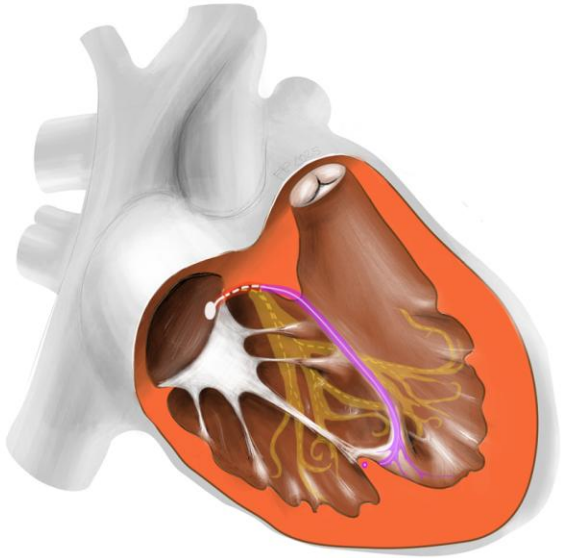
Right Ventricular Apical Pacing, Mean VD16 76 ms

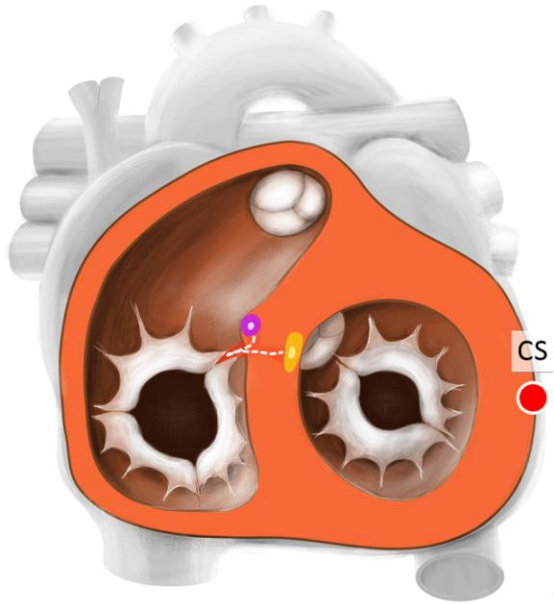






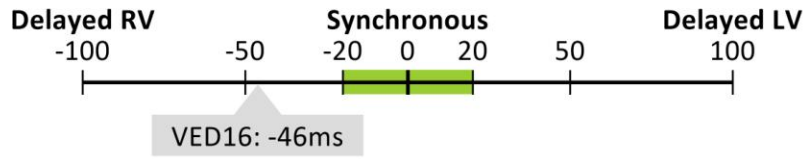
Collection 10: BiV AVD VVD Optimisation (3/7)

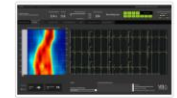


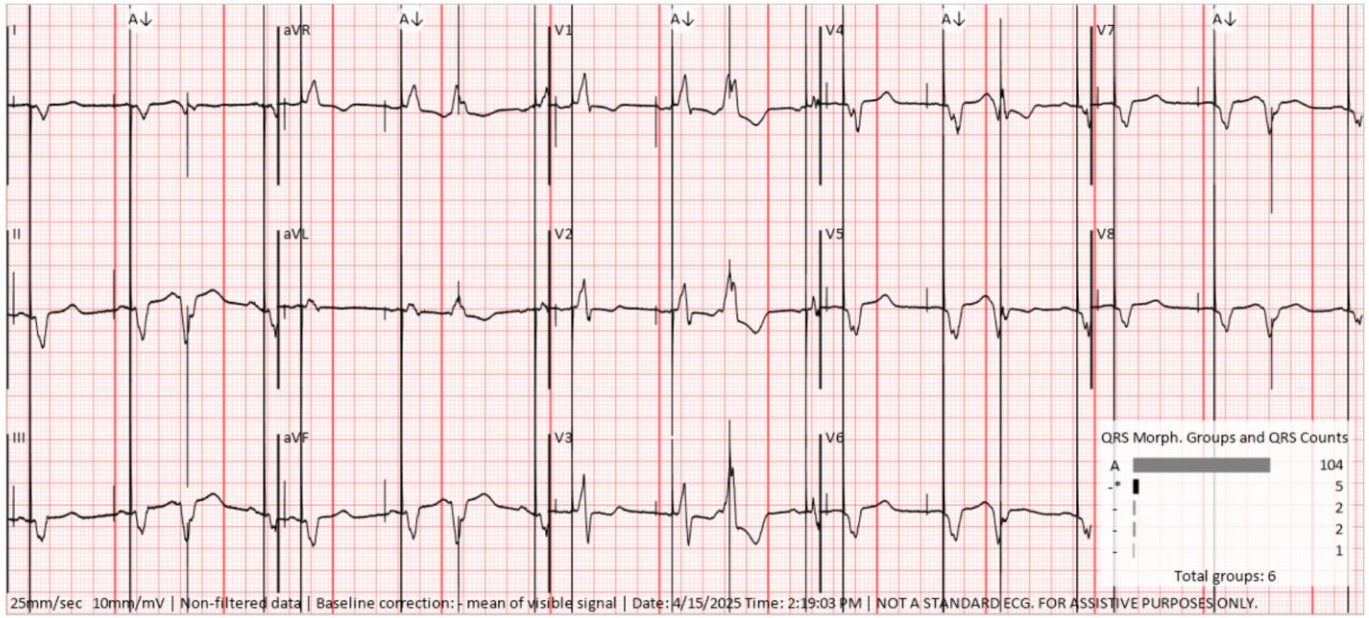


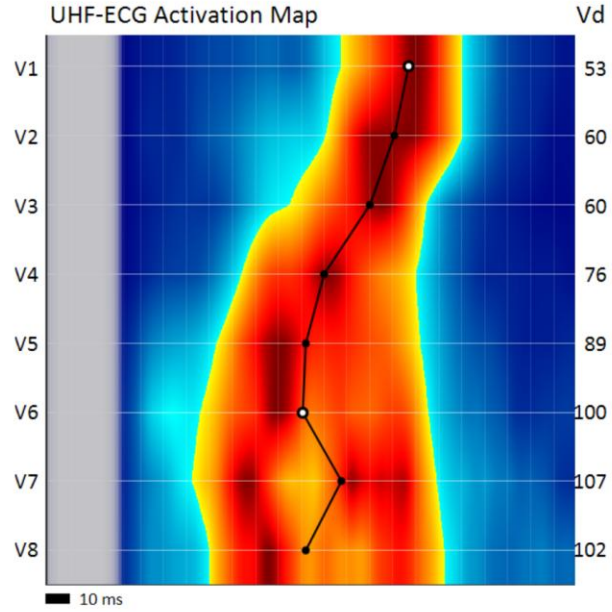
LV only

LV Coronary Sinus Pacing, Mean VD16 73 ms

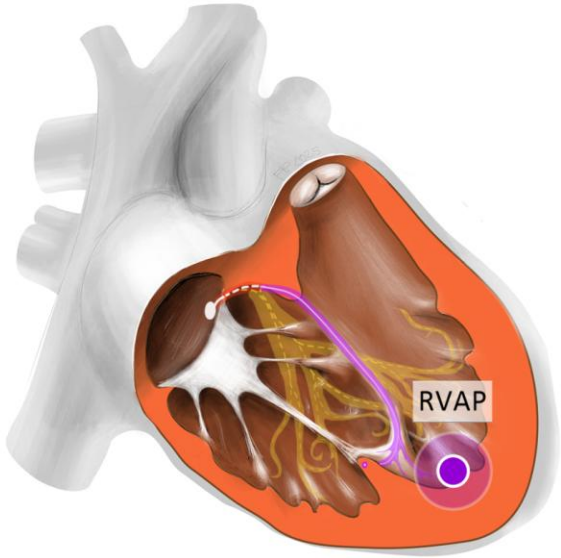


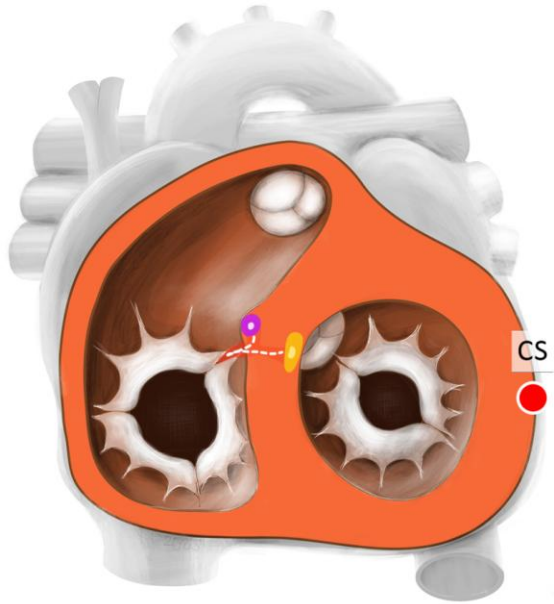






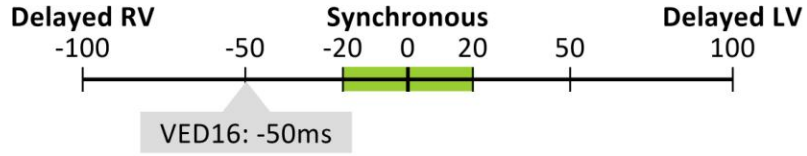
Collection 10: BiV AVD VVD Optimisation (4/7)

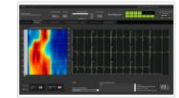


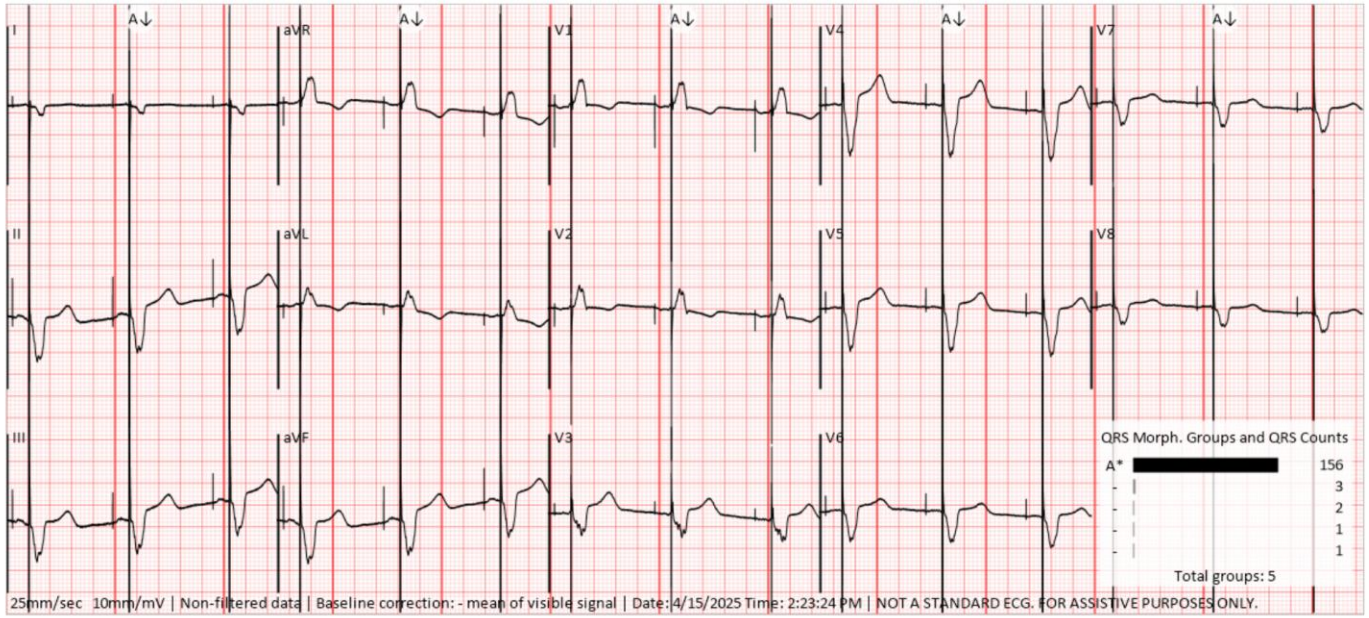


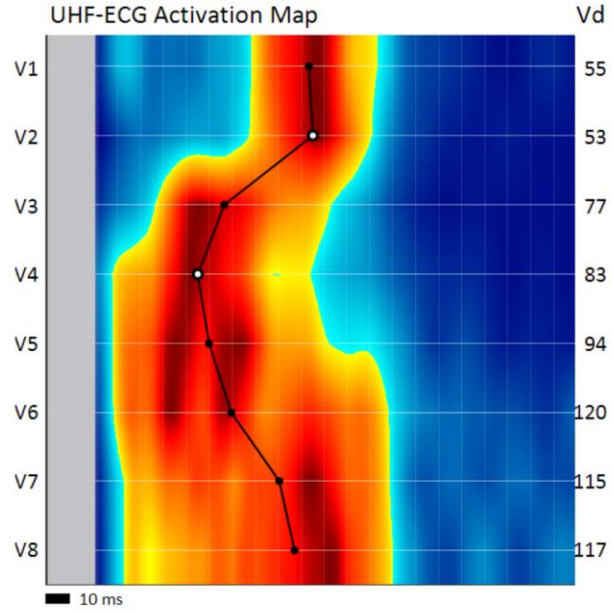
BiV

Biventricular Pacing, VV delay 0 ms, AV delay 150/120 ms. Mean VD16 80 ms



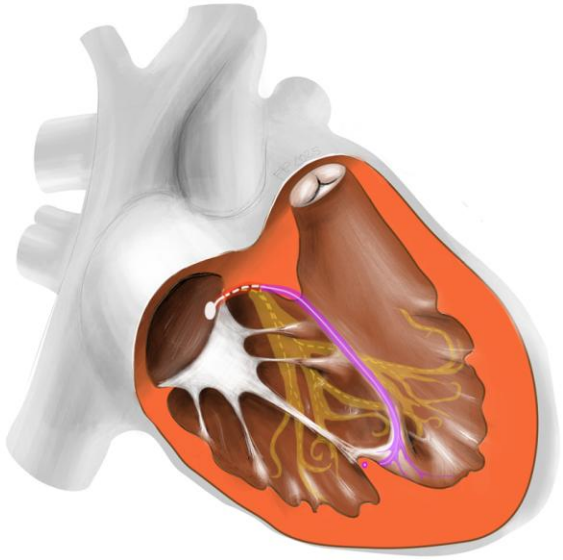


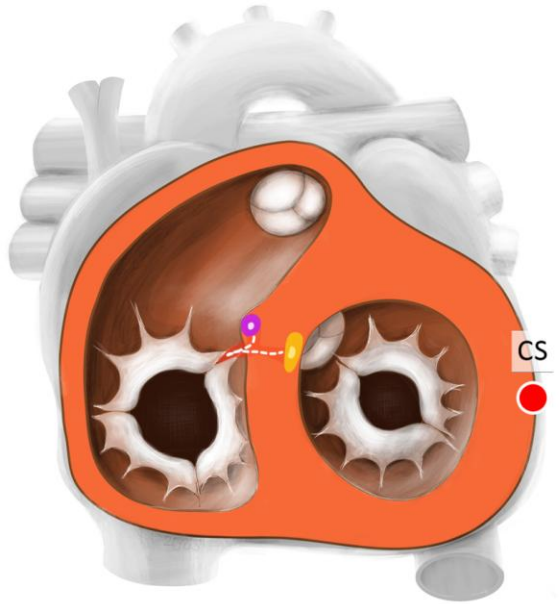




Collection 10: BiV AVD VVD Optimisation (5/7)

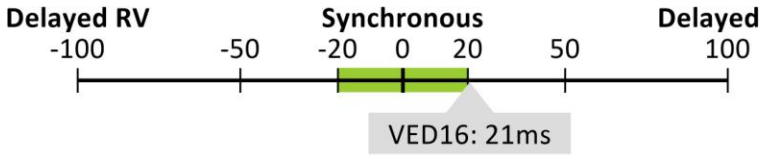
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

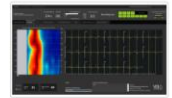


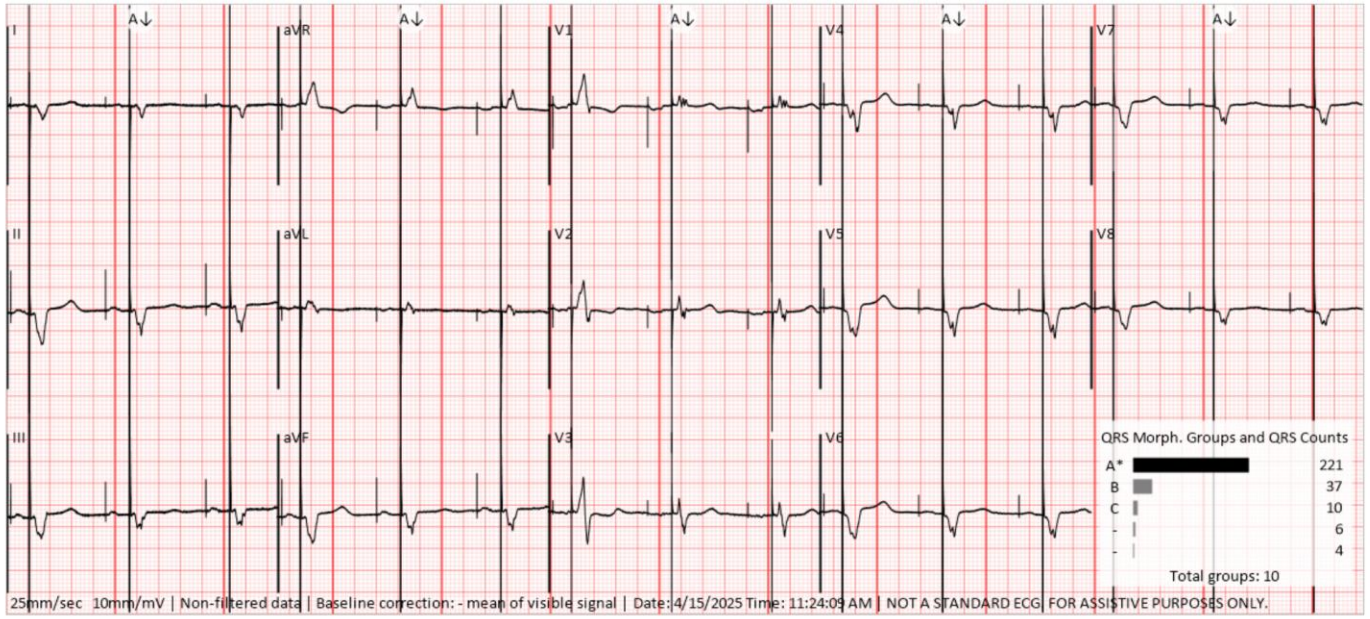


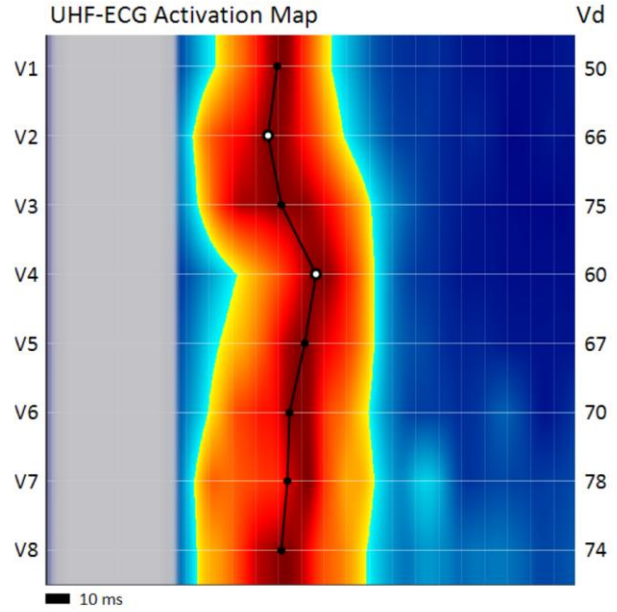
LV only fused

LV only pacing fused with spontaneous RV activation, AV delay 220/170, Mean VD16 65 ms

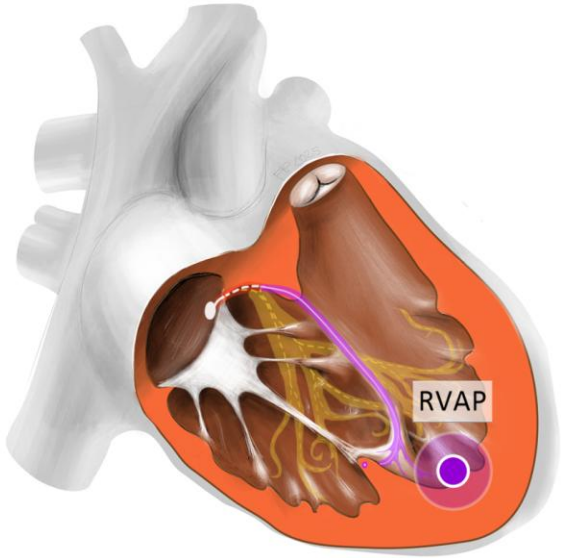


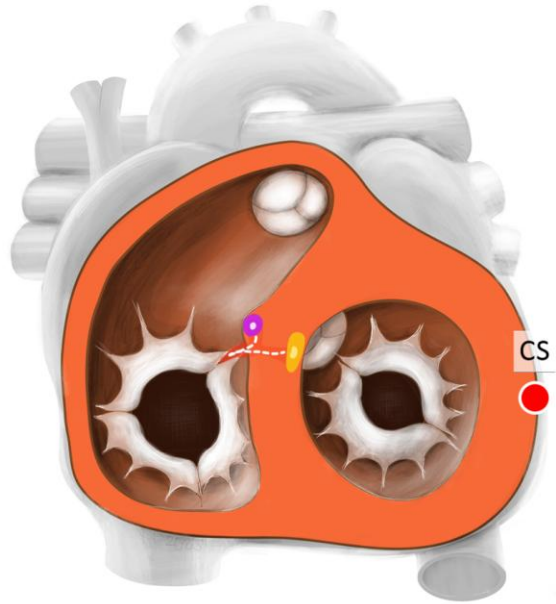






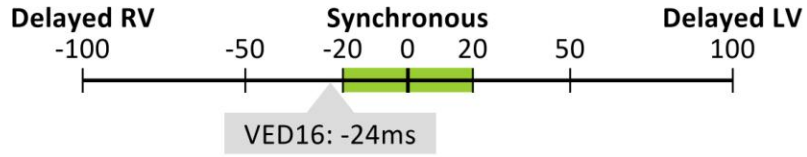
Collection 10: BiV AVD VVD Optimisation (6/7)

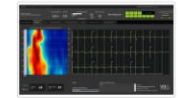


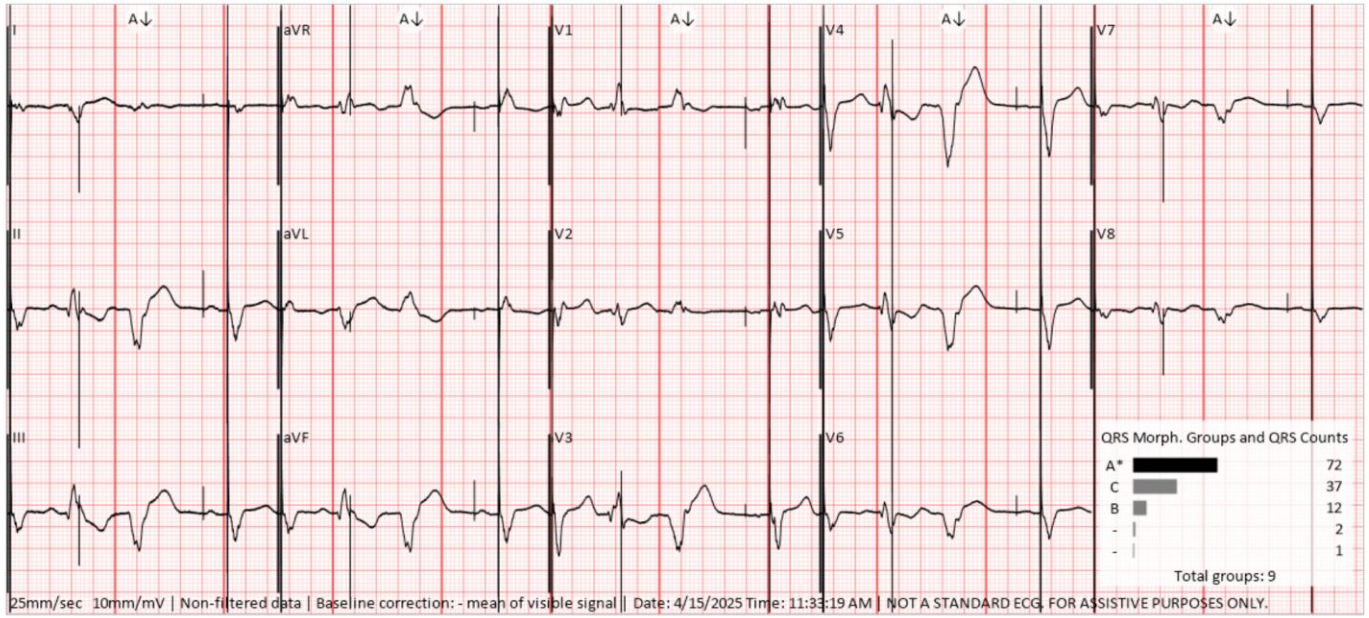


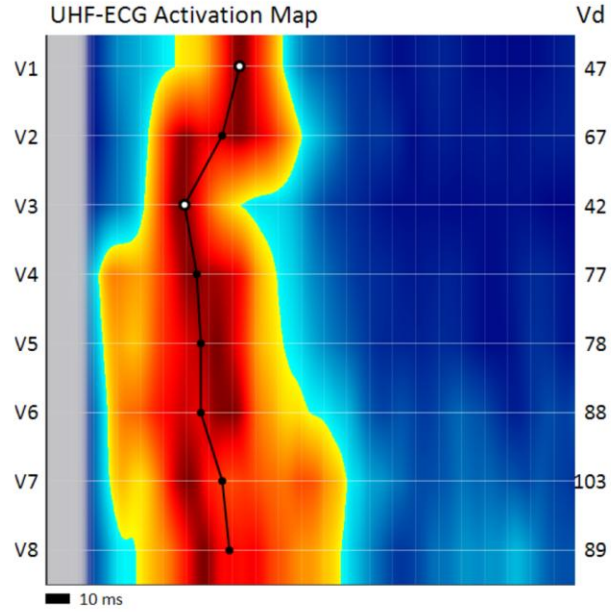
BiV Opt 1

Biventricular Pacing, VV delay 0 ms, AV optimisation 220/170 ms, Mean VD16 67 ms



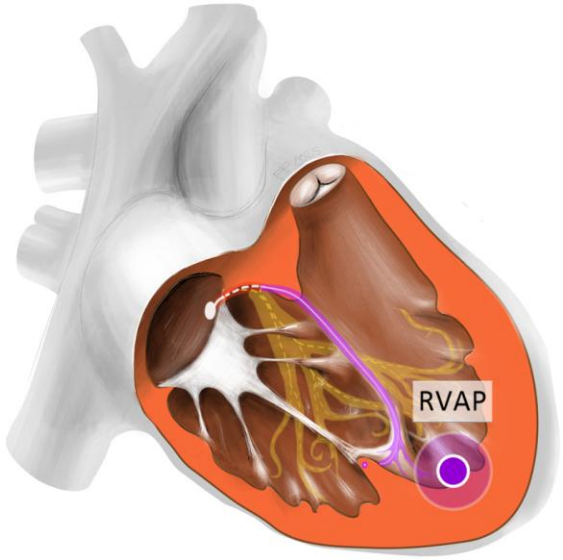


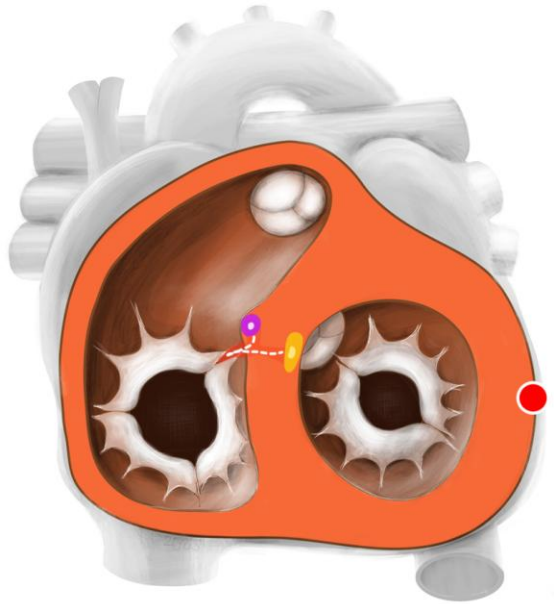




Collection 10: BiV AVD VVD Optimisation (7/7)

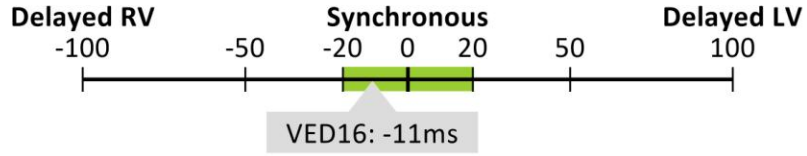
VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG TECHNOLOGIES

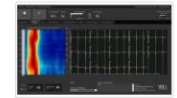


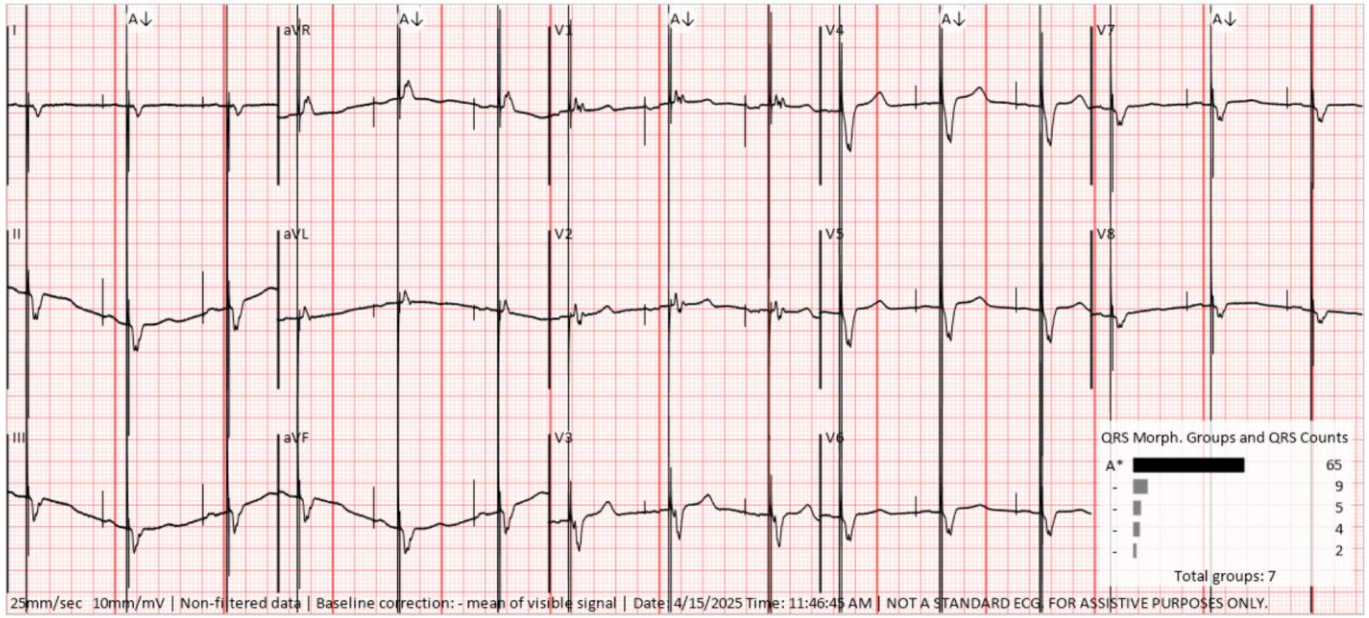


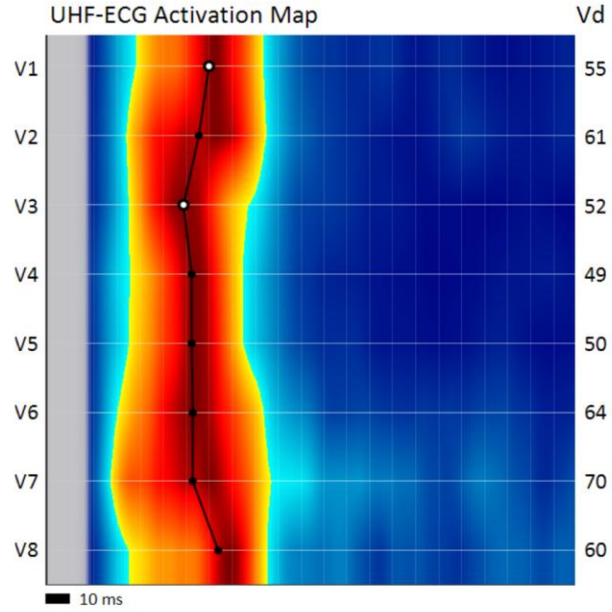
BiV Opt 2

Biventricular Pacing, VV delay -20 ms, AV optimisation 240/190 ms, Mean VD16 55 ms

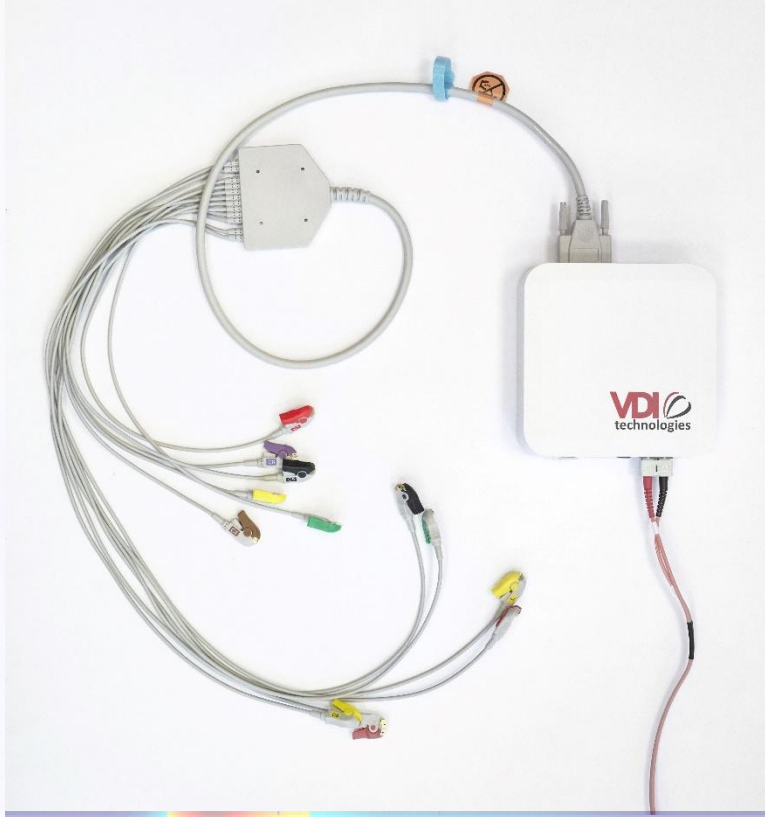


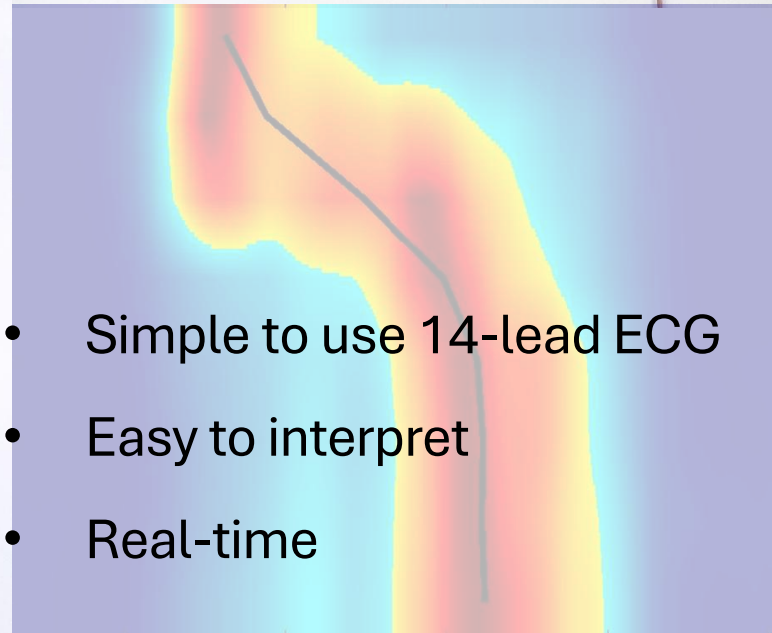






VENTRICULAR DYSSYNCHRONY IMAGING BY ULTRA-HIGH-FREQUENCY ECG
TECHNOLOGIES





- Simple to use 14-lead ECG
- Easy to interpret
- Real-time