

Ritmo Fetale



Agata Privitera

AOU Policlinico Catania

Cardiologia Pediatrica

Presidio San Marco

www.cardiologiapediatricact.com

Padova 22/02/2025

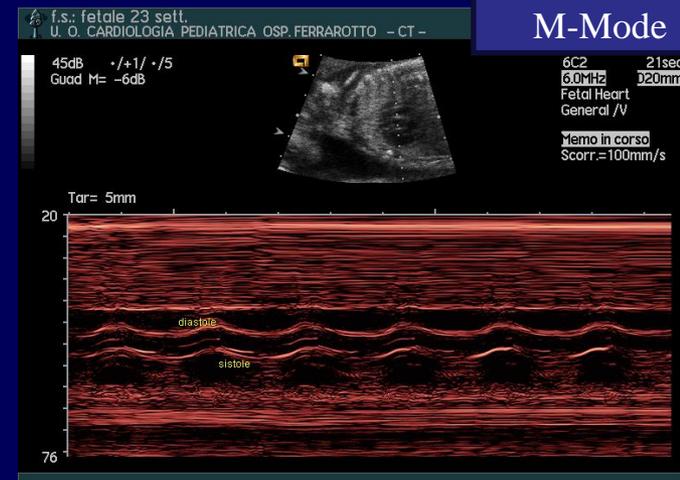
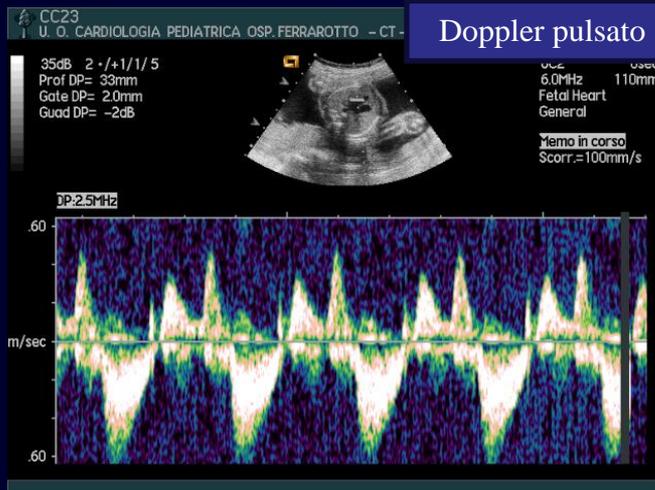
Ecocardiografia Fetale

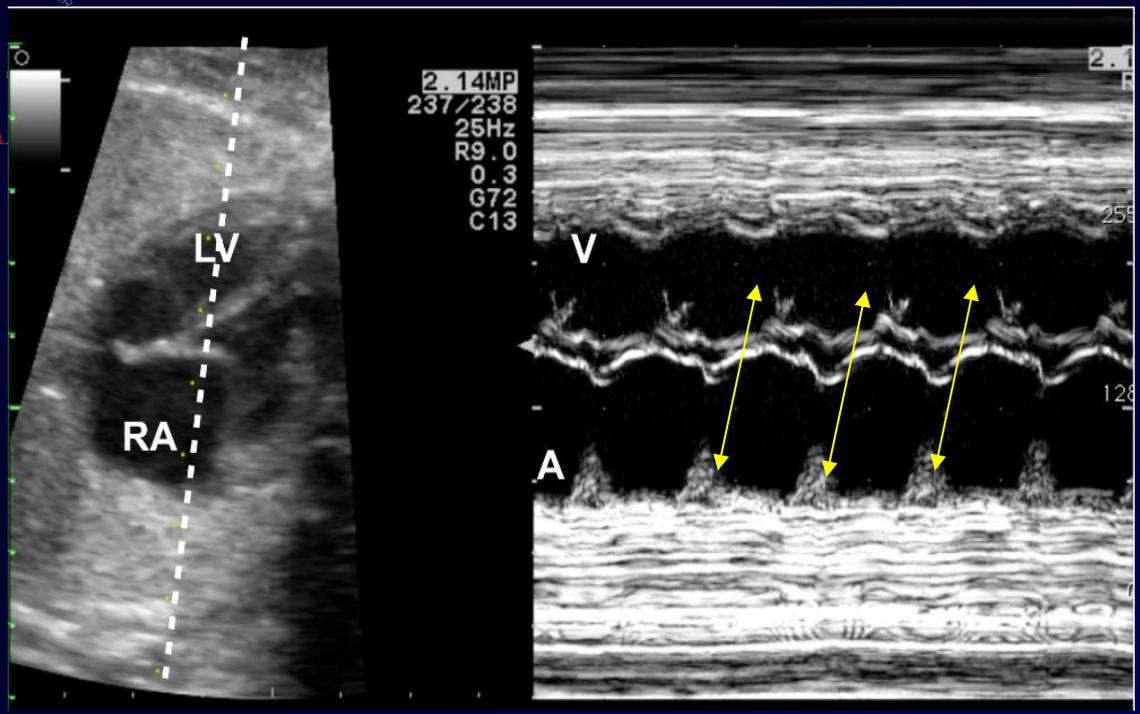
Valutazione Ritmo Cardiaco

Per l'alto potere di risoluzione temporale l'**M-Mode** ed il **Doppler Pulsato** vengono usati per lo studio del ritmo cardiaco



Frequenza cardiaca fetale normale 100-180 bpm



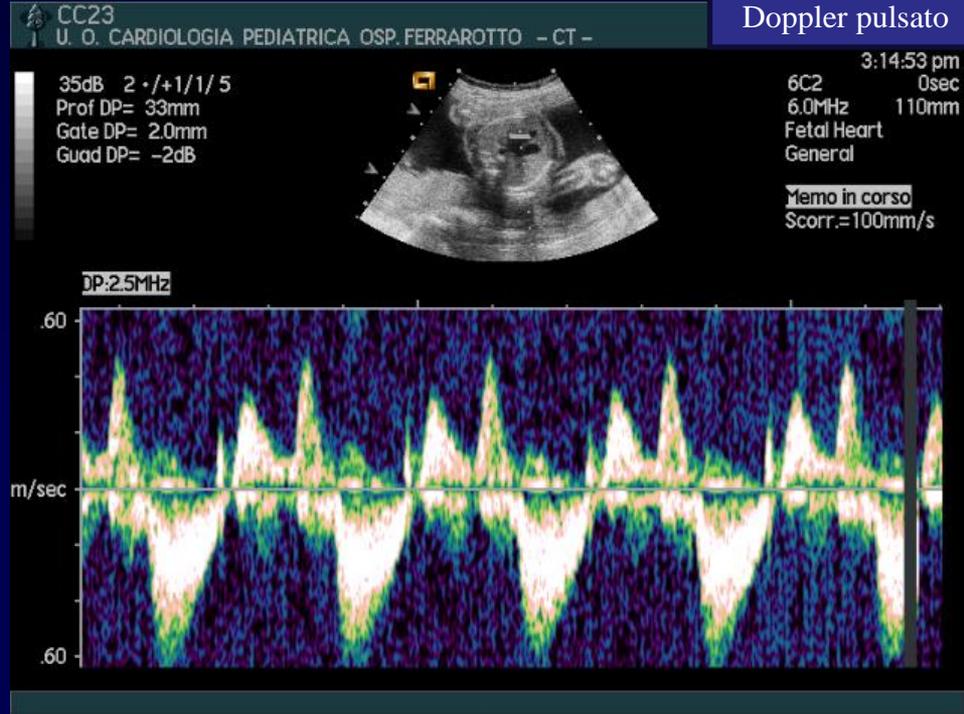


Frequenza cardiaca fetale
normale 100-180 bpm
con rapporto atrio A:V 1:1

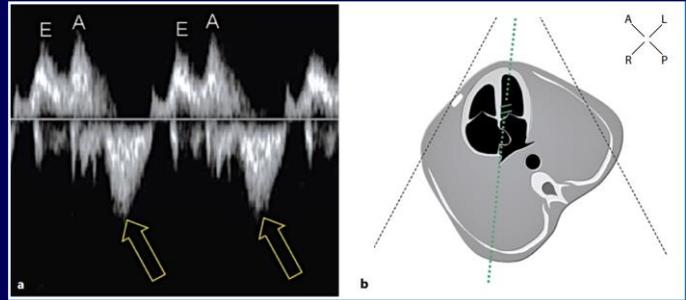


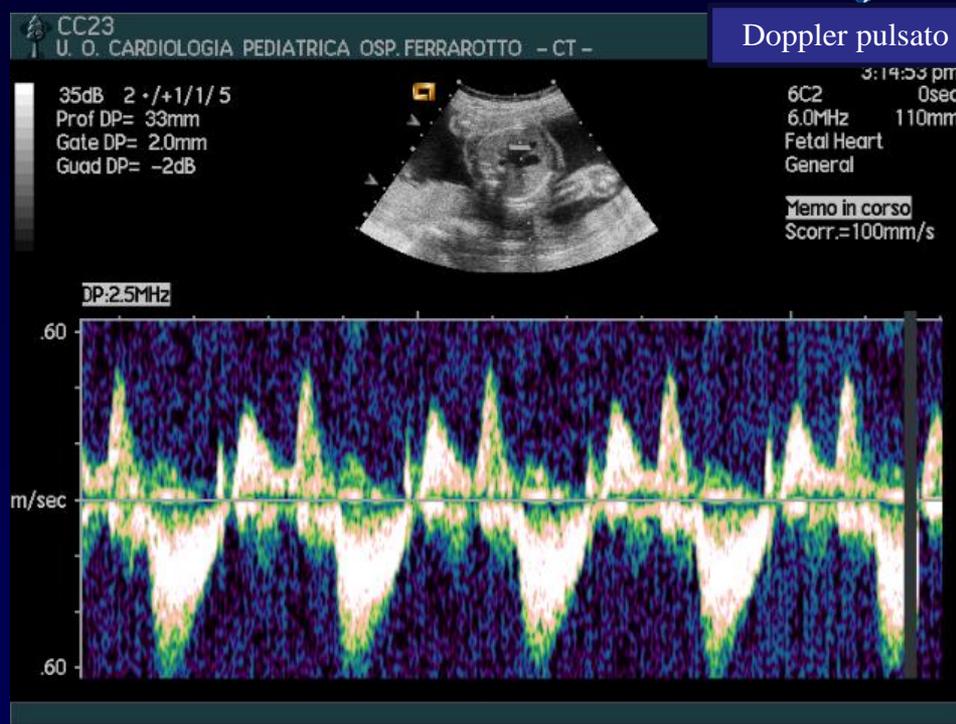
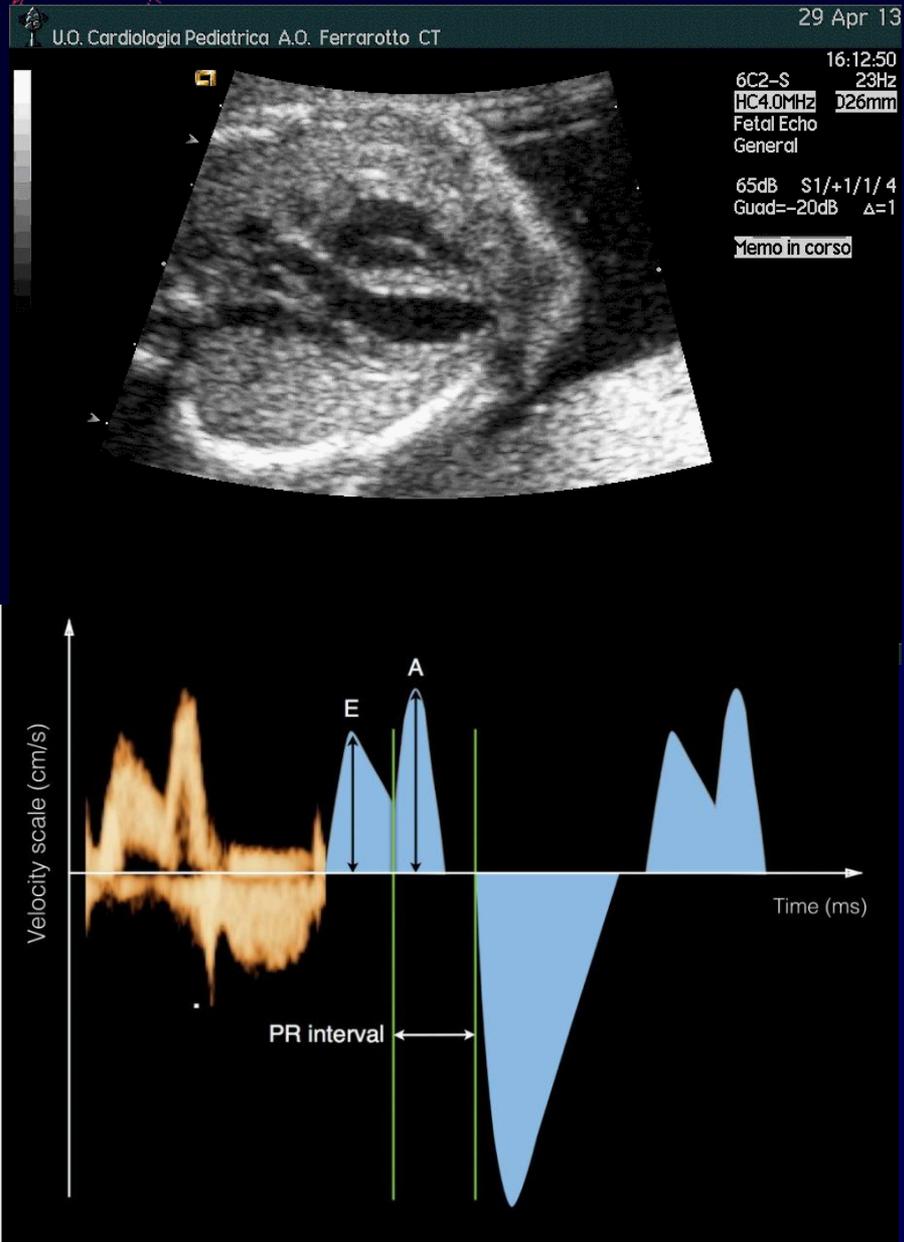
Frekuensi kardial fetal normal 100-180 bpm con A:V 1:1

Doppler pulsato



Frekuensi kardial fetal normal
 140±20 bpm sino all 20° Settimana
 130±20bpm vicino a temine
 gravidanza





PR 15a Settimana 90 msec
PR a termine 100 msec

Ecocardiografia Fetale

Ritmo Cardiaco Tratto PR

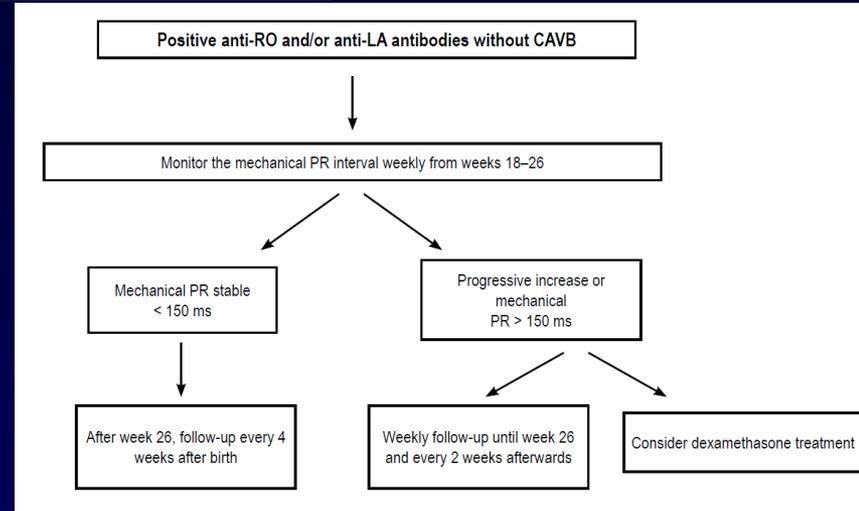
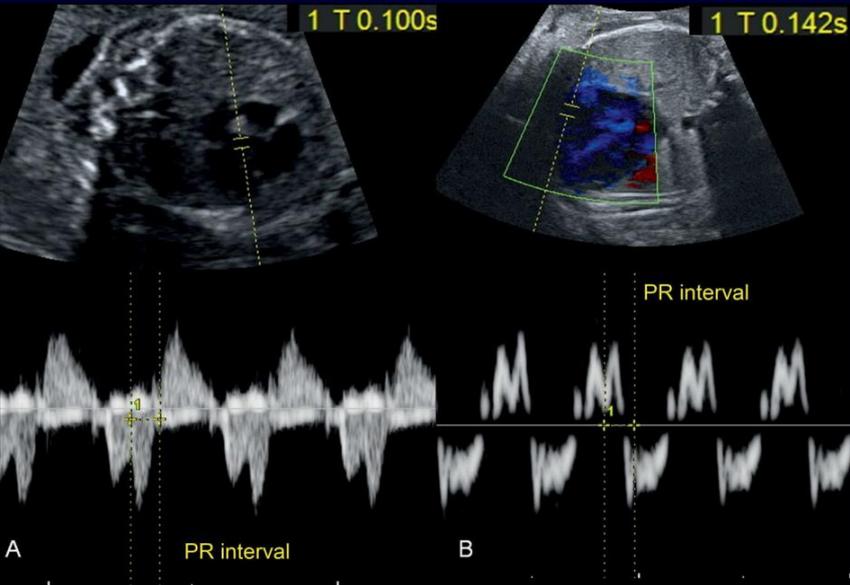
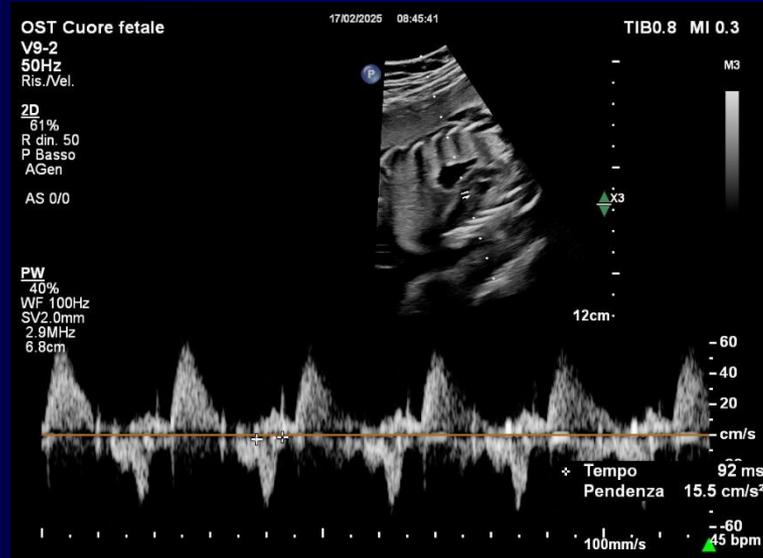
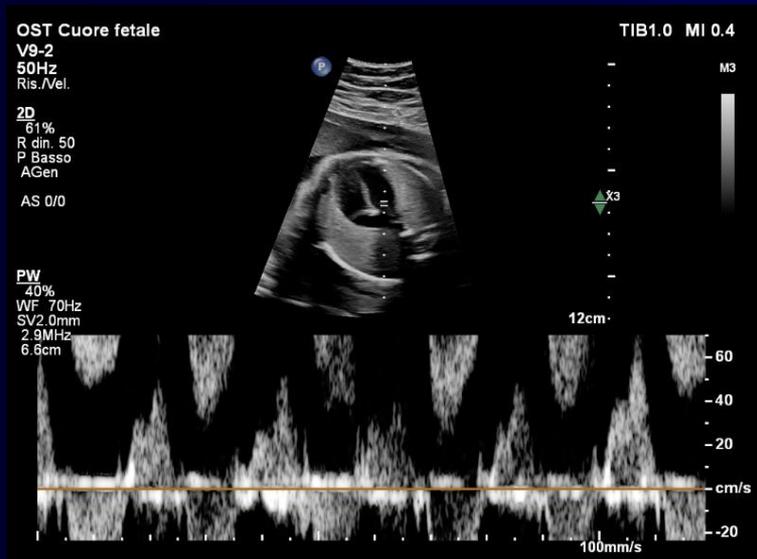
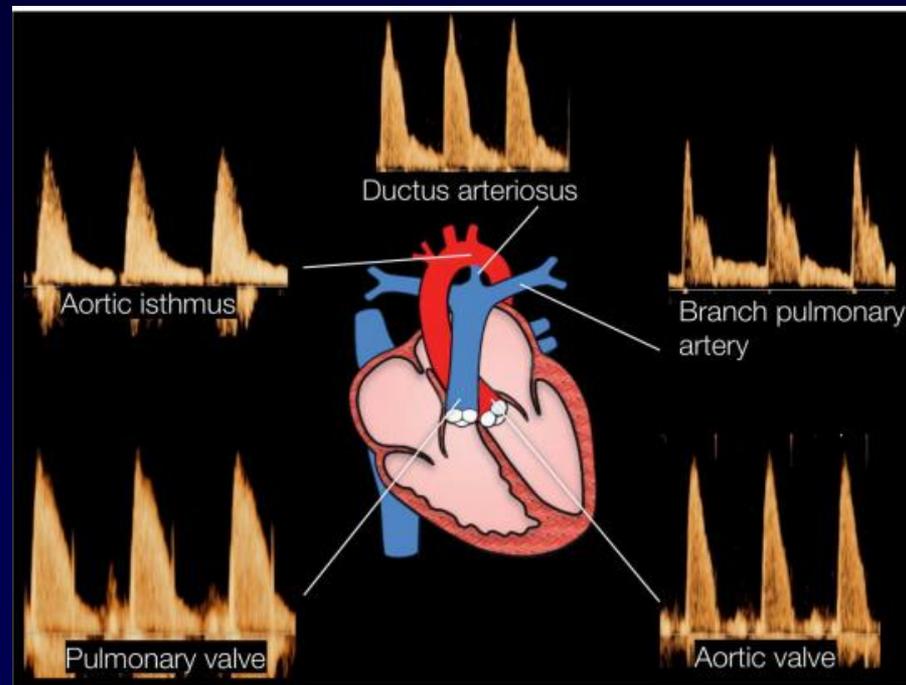
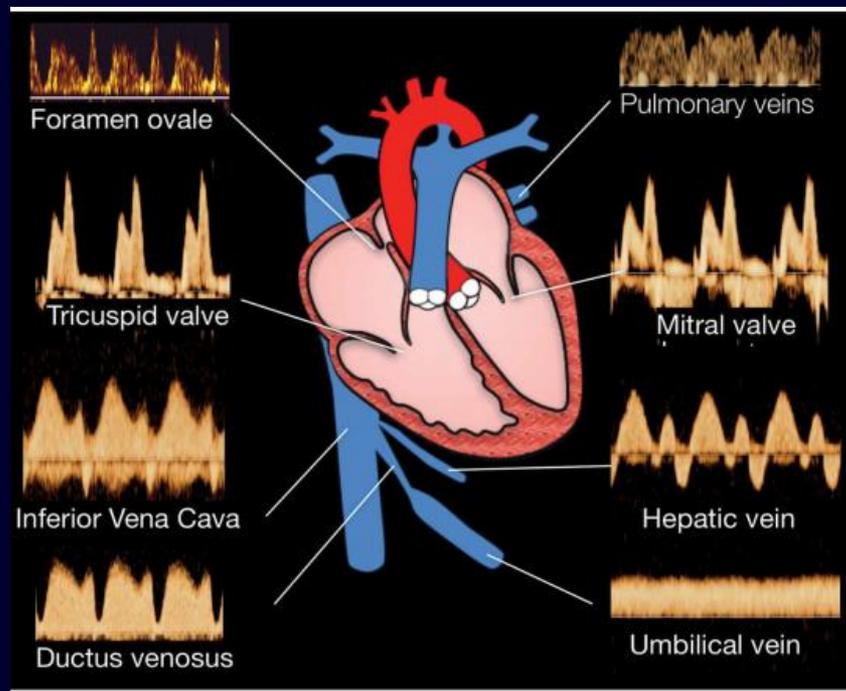


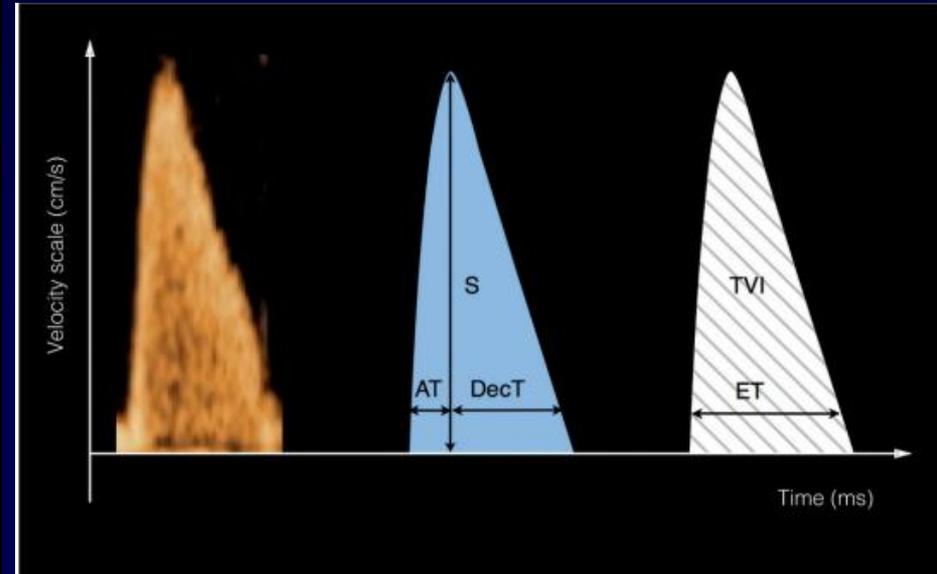
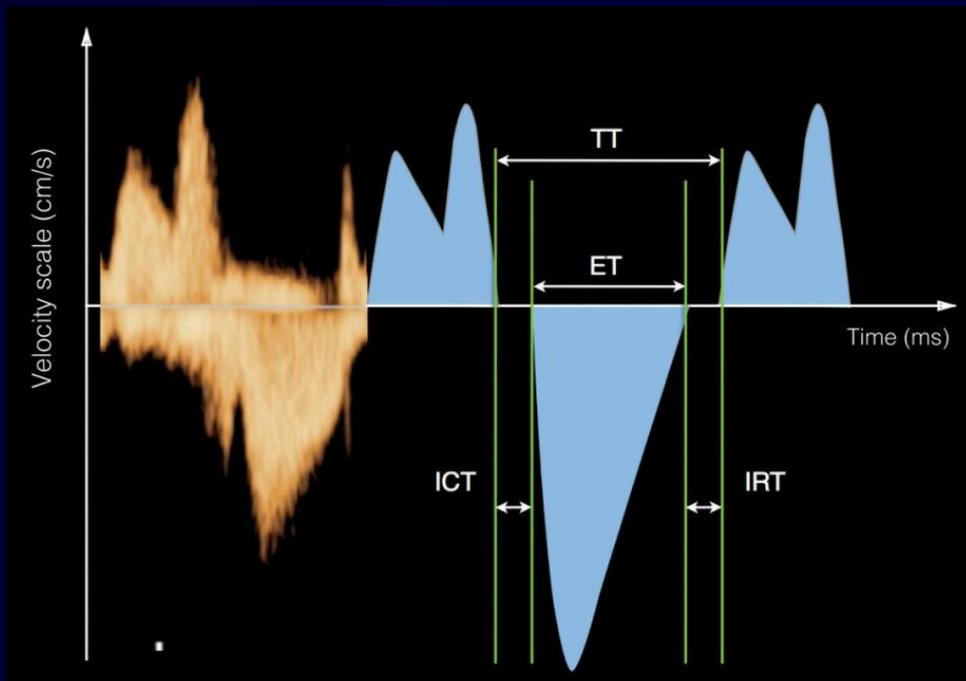
Figure 7.1 – Suggested approach for pregnant women with positive anti-RO and/or anti-LA antibodies without CAVB. **Brazilian Fetal Cardiology Guidelines – 2019**
CAVB: complete atrioventricular block; ms, milliseconds.



Valutazione Velocità



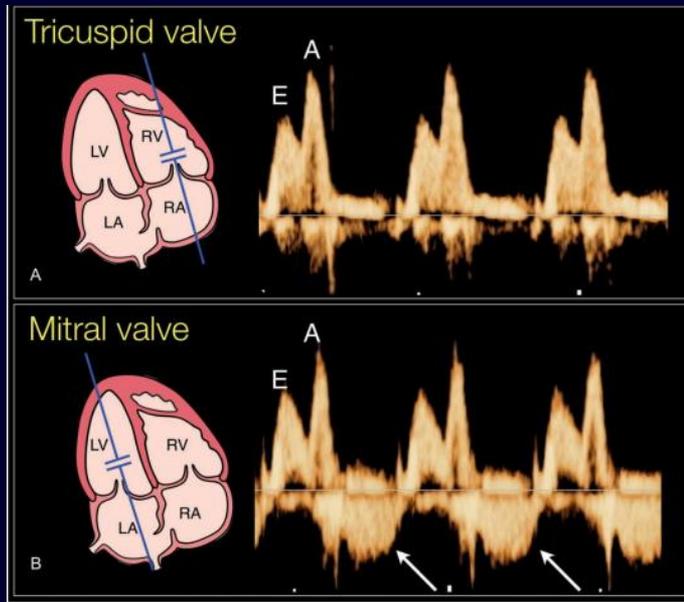
Indici di funzione sulla valvola mitrale ed efflusso sinistro



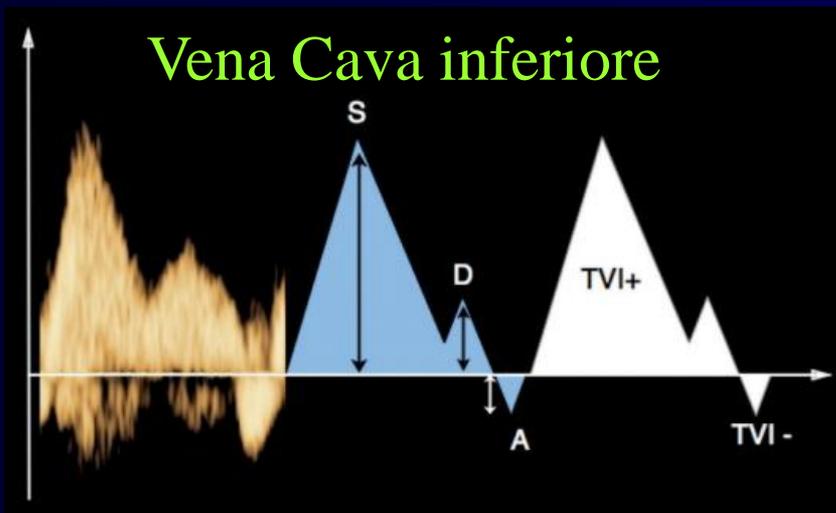
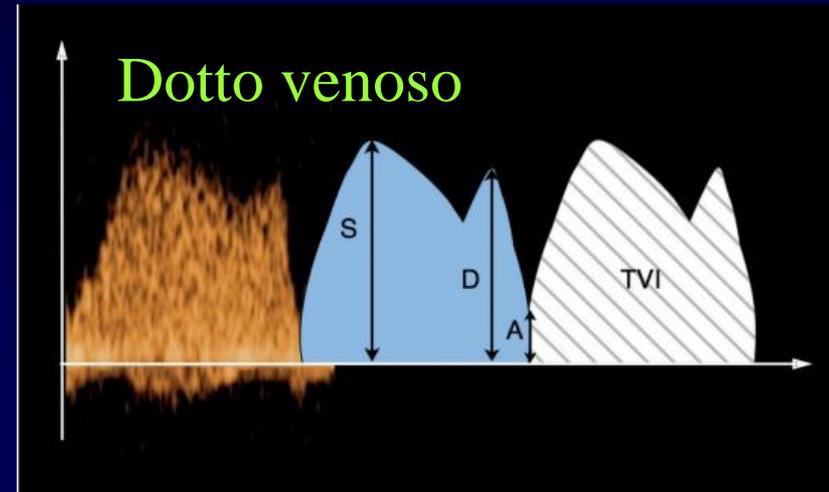
ET: tempo di eiezione sistolica, ICT: tempo di contrazione isovolumetrica, IRT: tempo di rilassamento isovolumetrico e TT è il tempo totale. $TT = ET + ICT + IRT$.

AT: tempo di accelerazione o velocità di picco, DecT: tempo di decelerazione. S è la velocità sistolica di picco. ET: tempo di eiezione sistolica. TVI: integrale tempo-velocità (area sotto la curva)

Indici di funzione diastolica



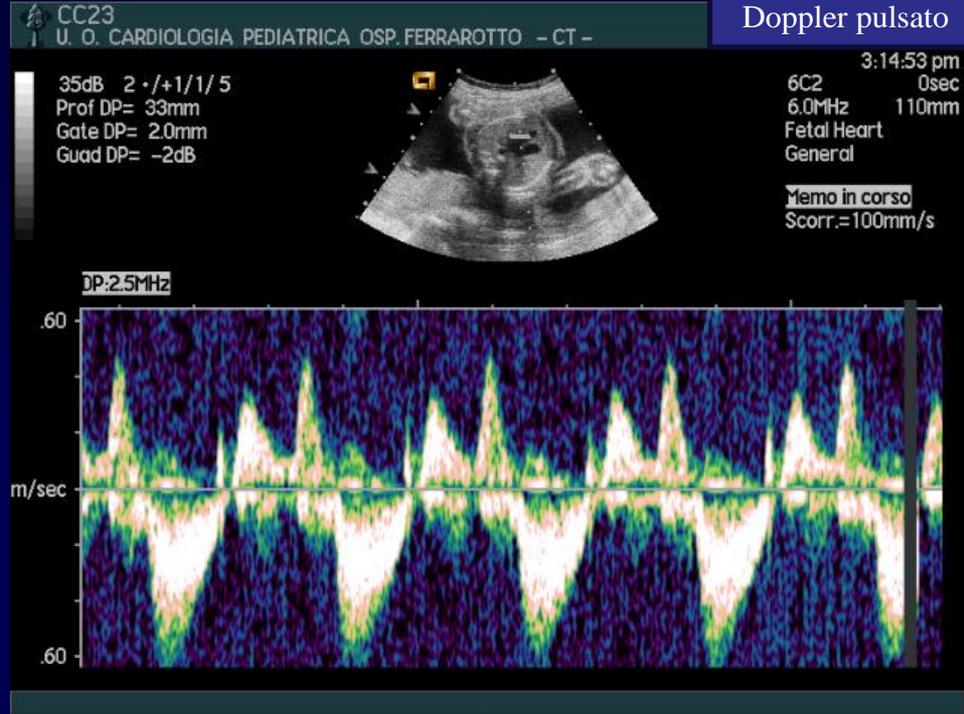
Dotto venoso S: velocità sistolica, D: velocità diastolica, A: velocità nadir durante la contrazione atriale, TVI integrale tempo-velocità (area sotto la curva).



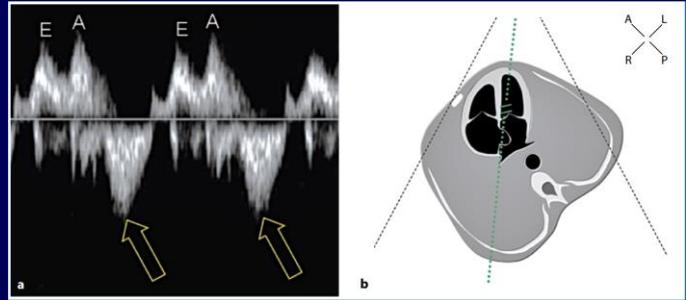
Flusso vena cava S: velocità massima sistolica, D: velocità massima diastolica, A: flusso di inversione atriale durante la contrazione atriale, TVI: integrale tempo-velocità (area sotto la curva).

Frekuensi kardiala fetal normal 100-180 bpm con A:V 1:1

Doppler pulsato



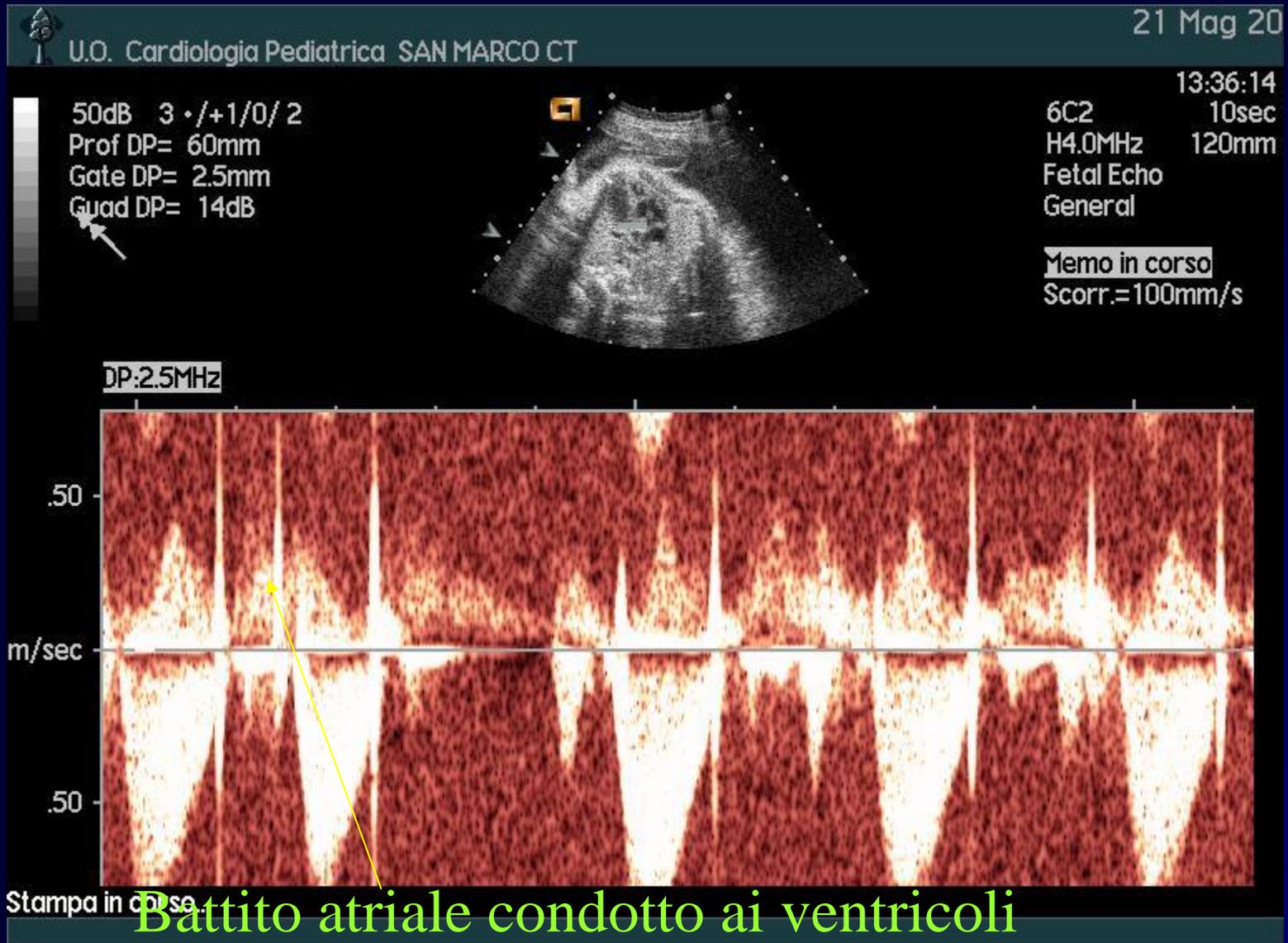
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 140±20 bpm sino all 20°
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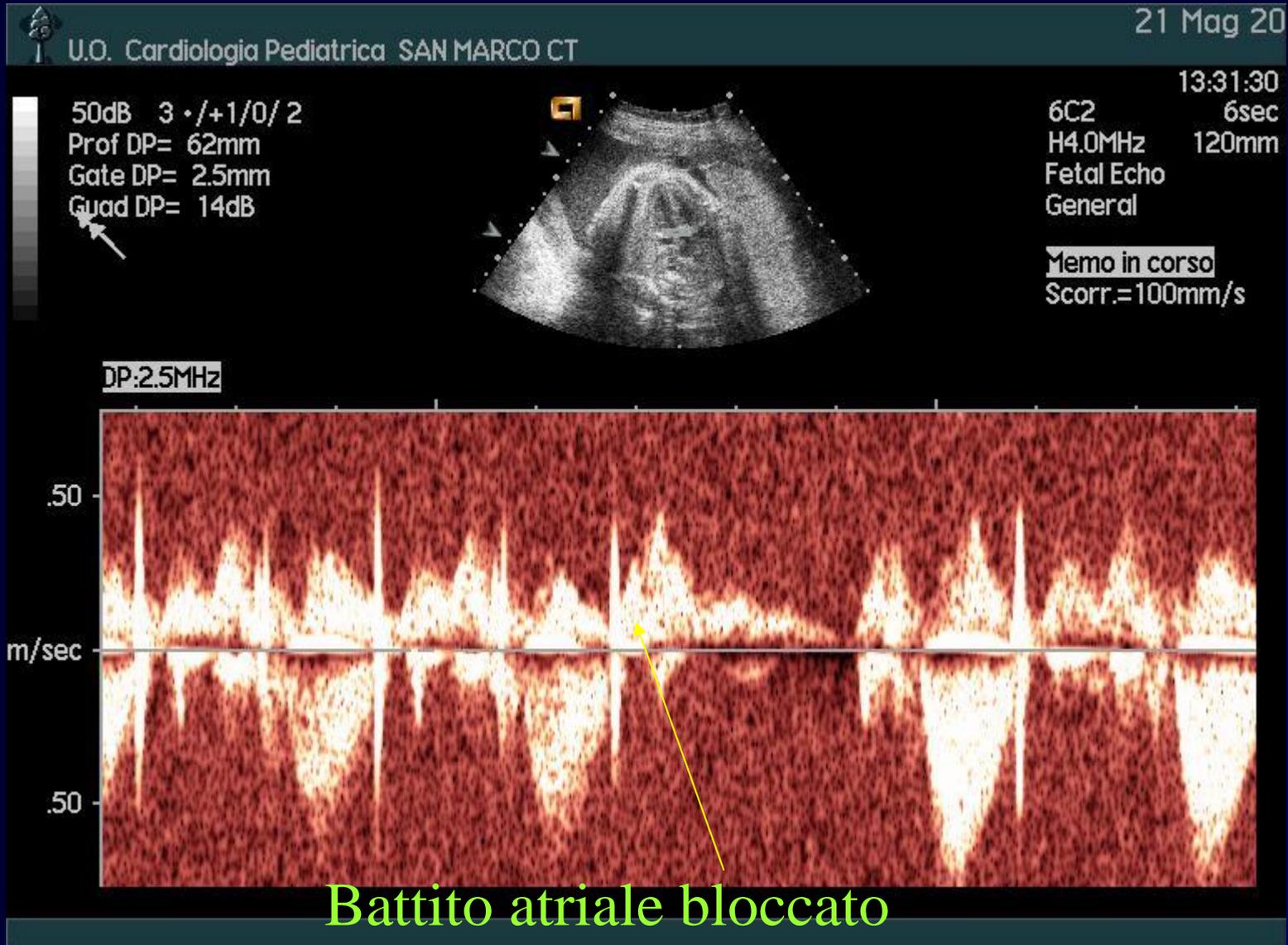
Irregolarità del Ritmo



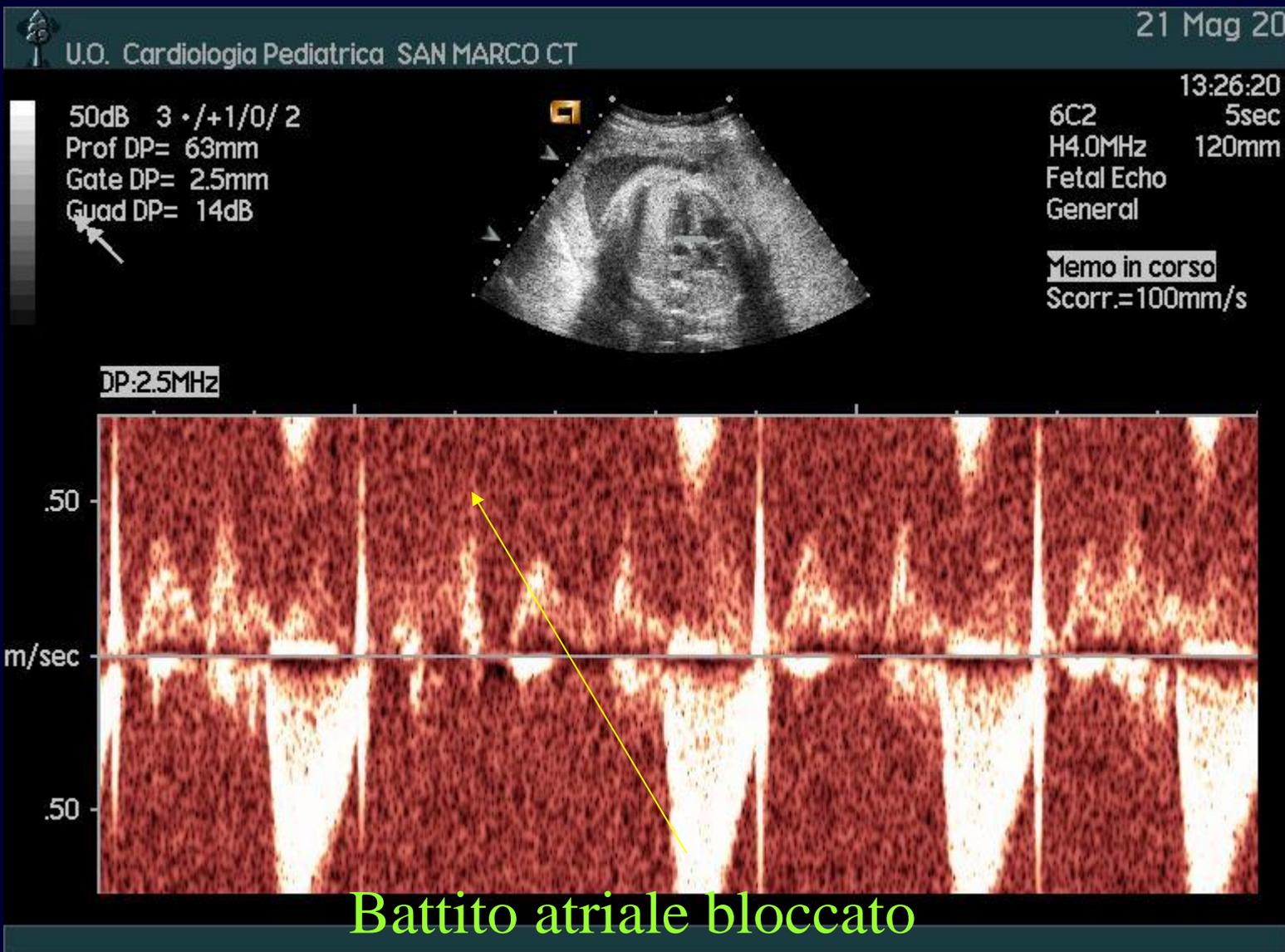
Irregolarità del Ritmo



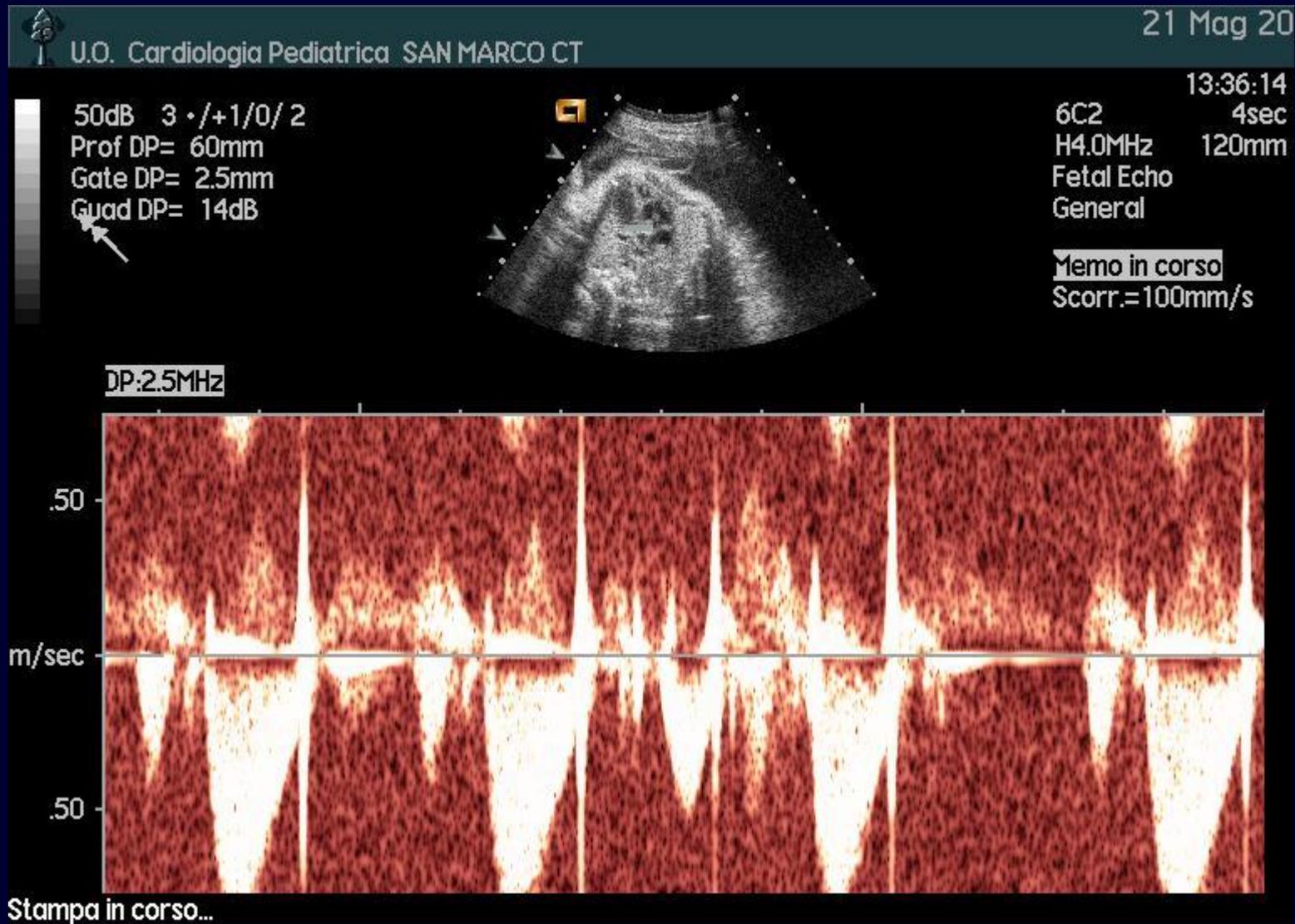
Irregolarità del Ritmo



Irregolarità del Ritmo



Irregolarità del Ritmo



Battito atriale interpolato

Ritmo Bradicardico

Table 32.1 Fetal bradydysrhythmia – possible causes

Sinus bradycardia

short episodes: vagal tone

Sustained sinus bradycardia

sinus node dysfunction

maternal hypothermia

long-QT syndrome

Frequently occurring blocked premature atrial contractions

Familial idiopathic atrial fibrillation with slow ventricular response

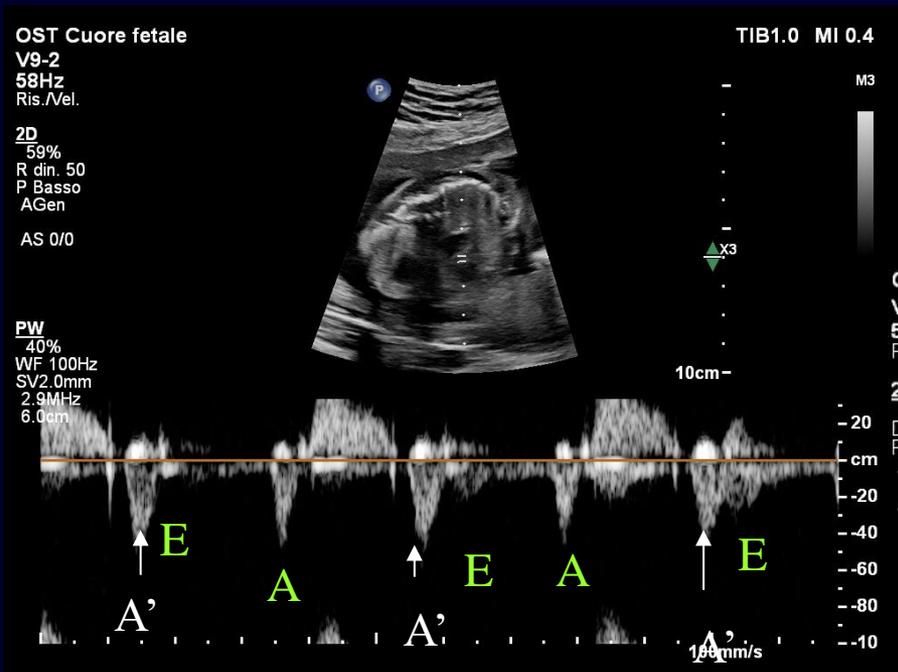
Second-degree atrioventricular block

Third-degree (complete) atrioventricular block



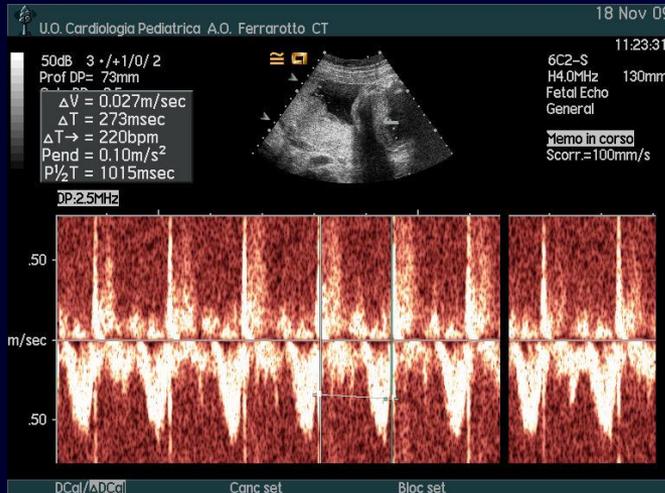
Fetal medical therapy with **sympathomimetics** is reasonable to consider for fetuses with AV block with ventricular rates **<55 bpm** or AV block at a higher ventricular rate with associated severe CHD or signs of fetal heart failure or hydrops fetalis (*Class IIa; Level of Evidence B*).

Ritmo Bradicardico



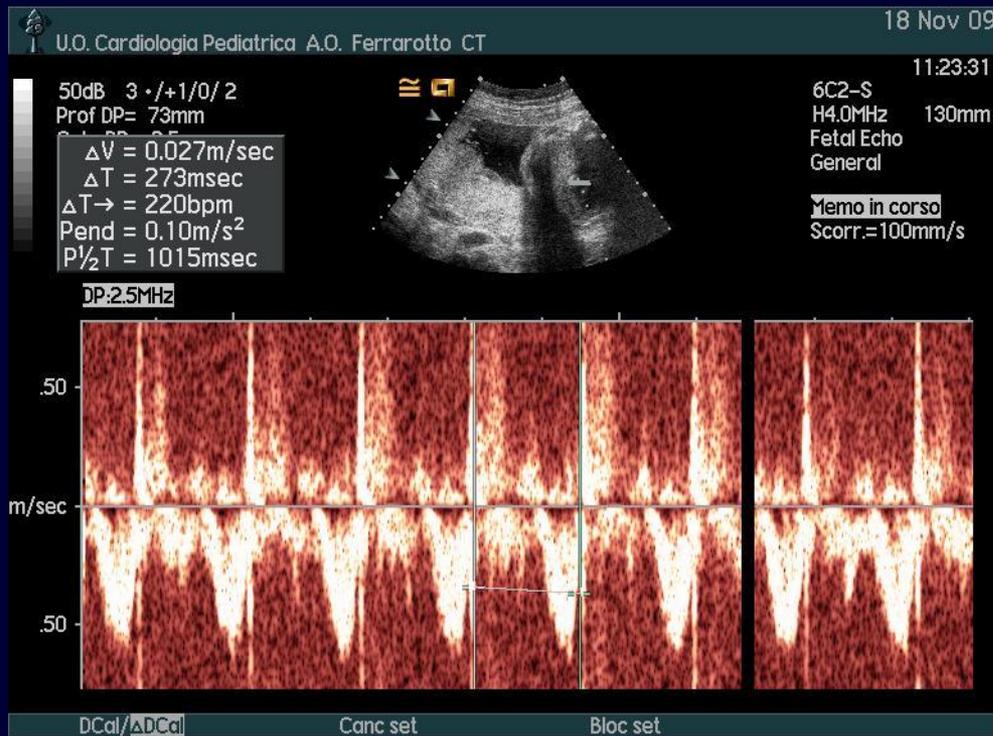
Battiti atriali bloccati
 tipo 2:1

Ritmo Tachicardico

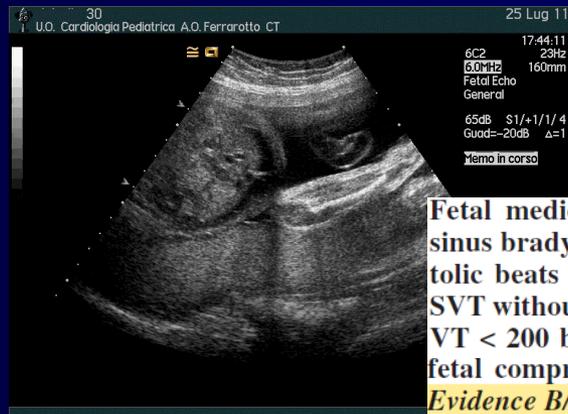


- Fetal tachycardia is defined by a sustained fetal ventricular heart rate of greater than 180 beats/min.
- Sinus tachycardia is characterized by equal atrial and ventricular rates in the range of 180 to 200 beats/min, one-to-one AV conduction, normal AV interval duration, and variability in the heart rate.
- SVT is the most common cause of fetal tachycardia and accounts for about 66% to 90% of all cases.
- In SVT, the tachycardia range is typically around 220 to 240 beats/min, there is 1:1 ratio of AV conduction, and the fetal heart rate is monotonous with lack of atrial or ventricular rate variability.
- Atrial flutter in the fetus is defined by a rapid regular atrial rate of 300 to 600 beats/min, accompanied by variable degrees of AV conduction block, resulting in a slower ventricular rate, typically around 220 to 240 beats/min.
- Ventricular tachycardia is rare and presents with ventricular rates of more than 180 beats/min in the setting of AV dissociation.
- Atrial fibrillation is a rare form of fetal tachycardia that involves a rapid and irregular atrial rate with a blocked AV conduction.

Ritmo Tachicardico



Fetali persistenti che evolvere in scompenso



Fetal medical therapy is of no benefit for fetuses with sinus bradycardia, irregular rhythms caused by extrasystolic beats (*Class III; Level of Evidence A*), intermittent SVT without fetal compromise or hydrops, or intermittent VT < 200 bpm (accelerated ventricular rhythm) without fetal compromise or hydrops fetalis (*Class III; Level of Evidence B/C*).

Fetal medical therapy should be offered for fetuses with sustained SVT or VT or sustained tachycardias including multifocal atrial tachycardia, atrial ectopic tachycardia, persistent junctional reciprocating tachycardia, or junctional ectopic tachycardia with average heart rates >200 bpm if the fetus is not near term, and hydropic fetuses with an arrhythmia believed to be the cause of the fetal compromise (*Class I; Level of Evidence A*).

Fetal medical therapy is reasonable to consider for fetuses with intermittent VT at rates >200 bpm (*Class IIa; Level of Evidence B*).

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GRAZIE!

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