



UNIUNEA EUROPEANĂ



GUVERNUL ROMÂNIEI



Fondul Social European
POSDRU 2007-2013



Instrumente Structurale
2007-2013



GUVERNUL ROMÂNIEI
MINISTERUL MUNCII, FAMILIEI,
PROTECȚIEI SOCIALE
ȘI PERSOANELOR VÂRSTNICE
DIRIGINDUR REGIUNEA CENTRU



UNIVERSITATEA DE MEDICINĂ ȘI
FARMACIE "CAROL DAVILA"
BUCUREȘTI

AD-COR Program inovativ de formare in domeniul cardiologiei pediatrice POSDRU/179/3.2/S/152012

Julie 2015

MODUL TEORETIC

EKG (2)

Continut documentat/ validat/ prezentat de:

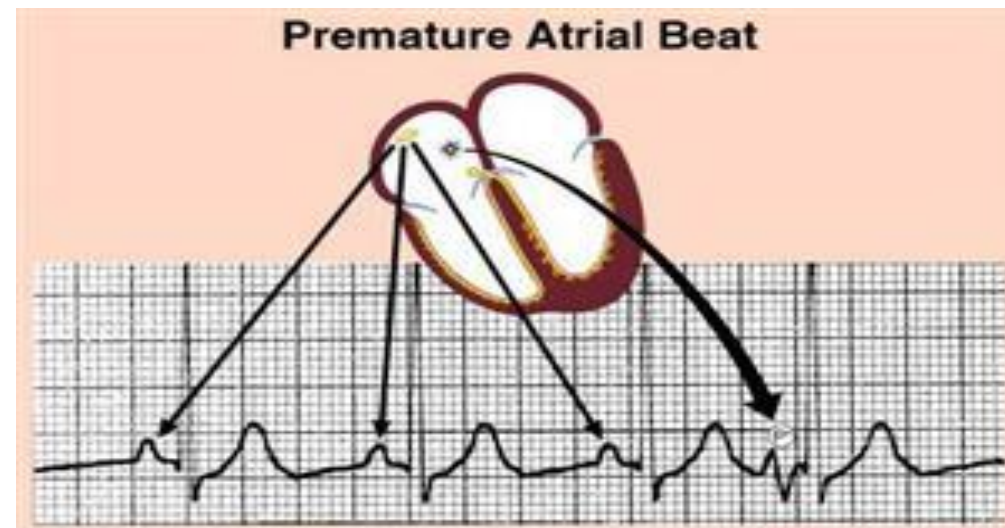
⇒xpert formare asistente: FILIP Cristina

A5 - Planificarea, organizarea si desfasurarea activitatilor de formare a asistentelor medicale in domeniul cardiologiei pediatrice

Extrasistolele supraventriculare

- Batai premature produse prin automatism ectopic la nivel atrial/junctional
- In cazuri rare, ExSv frecvente/ salve pot anunta instalarea unor tulburari de ritm sustinute

- QRS ingust!!



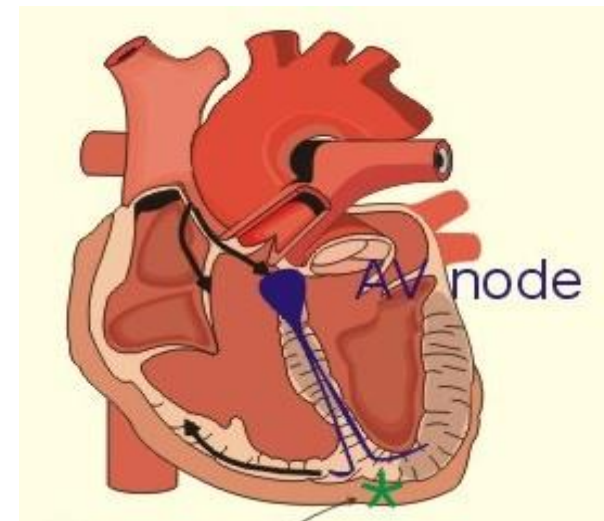
Extrasistole supraventriculare

- Uzual: pauza compensatorie post-Ex!
- De obicei benigne



Extrasistolele ventriculare

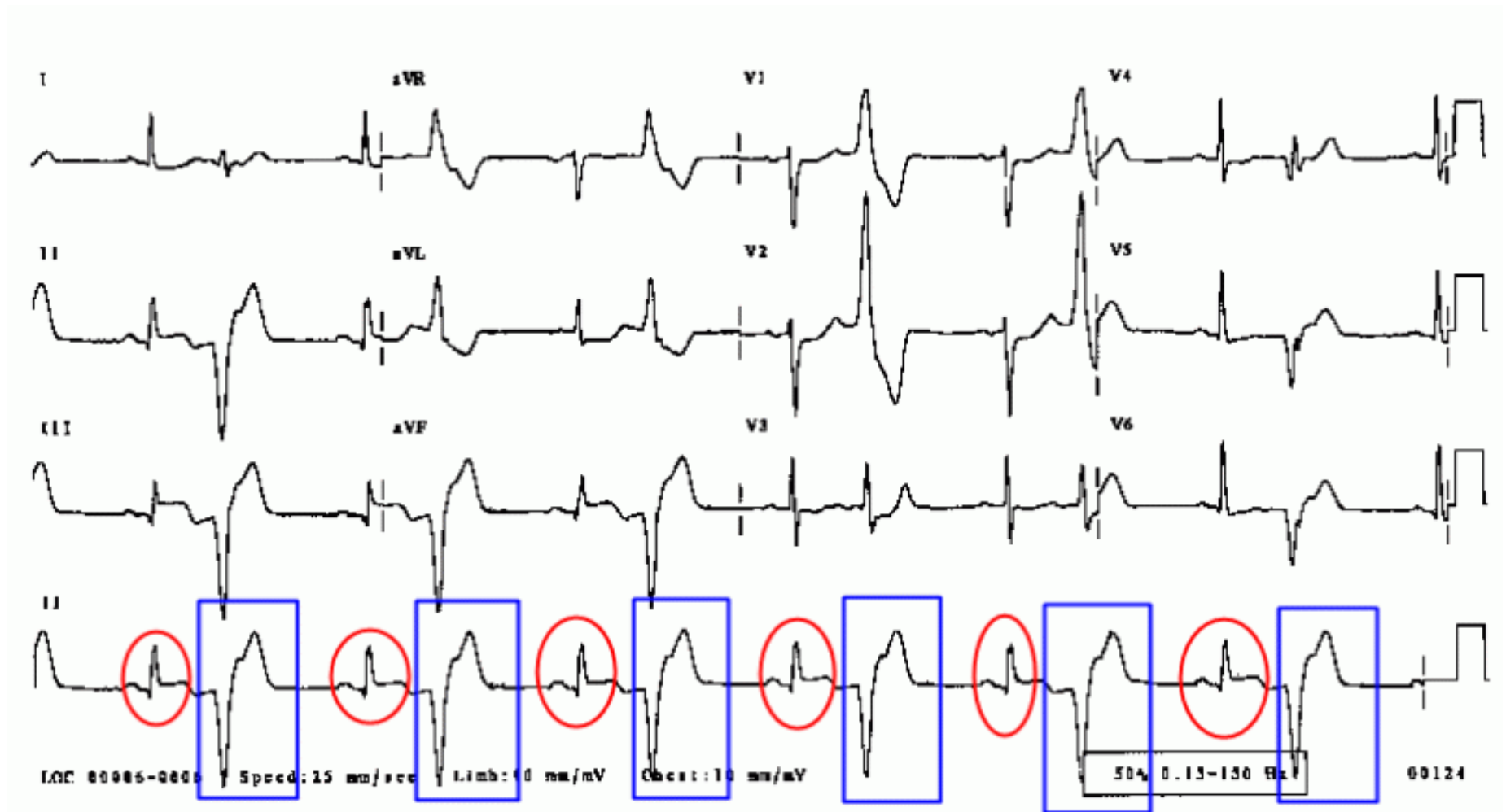
- Batai premature produse prin automatism ectopic la nivelul ventriculilor
- QRS larg (aspect de bloc de ramura stg/dr, functie de localizarea focarului)
- Uzual – pauza compensatorie



Extrasistolele V.

- Monofocale/Polifocale
- Nesistematizate (izolate)
- Sistematizate – bigeminism/trigeminism
 - cuplete/triplete

Bigeminism ventricular



Clinica ExV

- De obicei sunt benigne
- Se resimt ca palpitatii (frecvent se percepe pauza post-extrasistolica)
- Prezenta lor in numar redus/24 h (<200) este considerata normala
- Au valoare patologica in cazul unor boli subiacente (miocardita, sdr.WPW, sdr.QT lung, ischemie)

Cauze ExV

- Anxietate
- Medicamente (simpato-mimetice, beta-agonisti)
- Exces de cafeina
- [Hypokalaemia](#)
- [Hypomagnesaemia](#)
- Toxicitate digitalica
- Ischemie miocardica

Tratament Ex (V/SV)

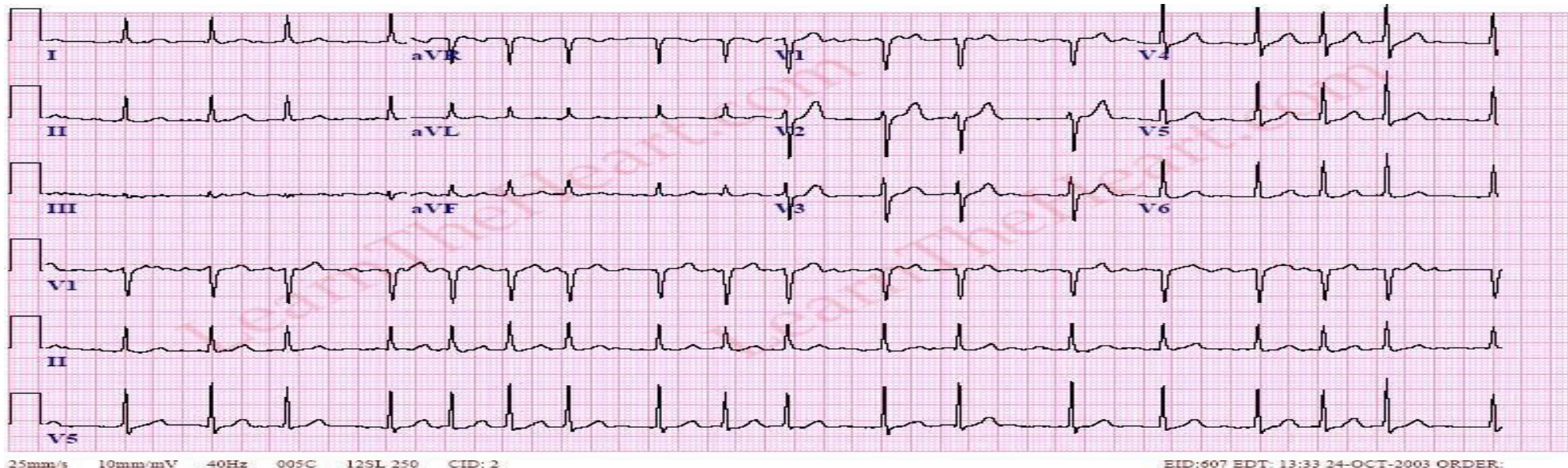
- Uzual nu necesita tratament
- Tratament se impune daca:
 - -exista boli subiacente (WPW, QT lung, ischemie,etc)
 - - sunt f.frecvente, sistematizate, cu risc de cardiomiopatie tahiaritmica in timp
 - Daca simptomele sunt foarte accentuate

Fibrilatie atriala

- Pe cord normal:
 - Extrem de rara la copii fara boala cardiaca structurala (-→ forma genetica)
 - Frecvent apare prin degenerarea TPSV in FiA
- Pe cord patologic
 - cel mai frecvent in cardiomiopatii, valvulopatii mitrale, dupa chirurgie cardiaca

Fibrilatie atriala

- Absenta undelor P (!!)
- Ritm neregulat
- Prezenta undelor f de FiA

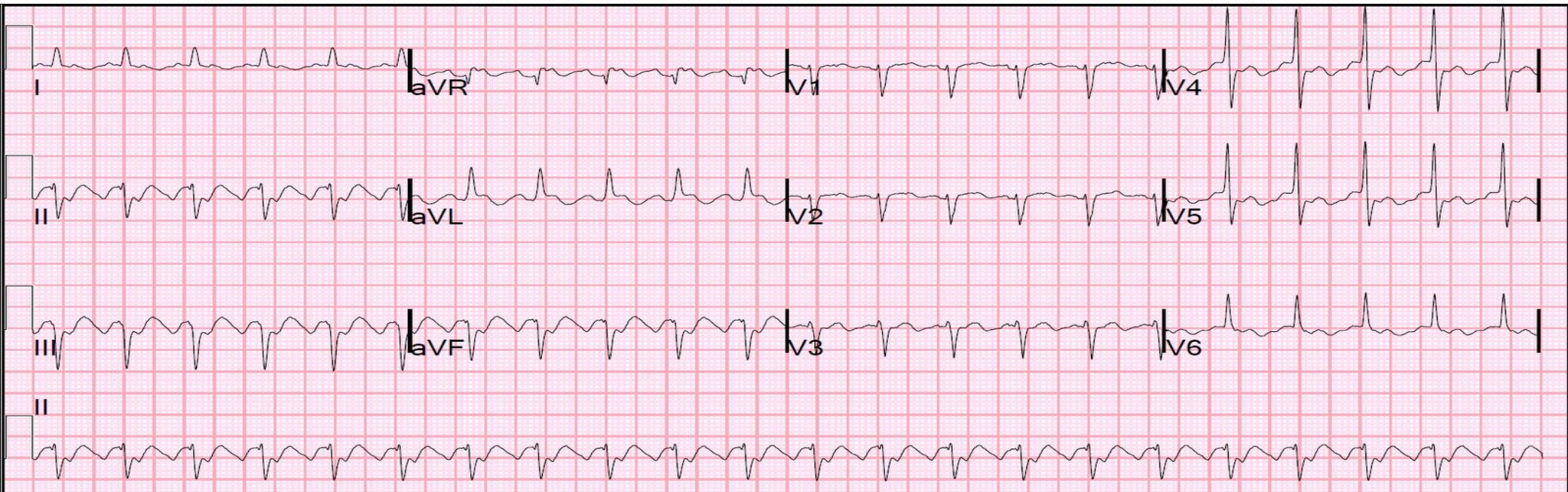


Flutter atrial

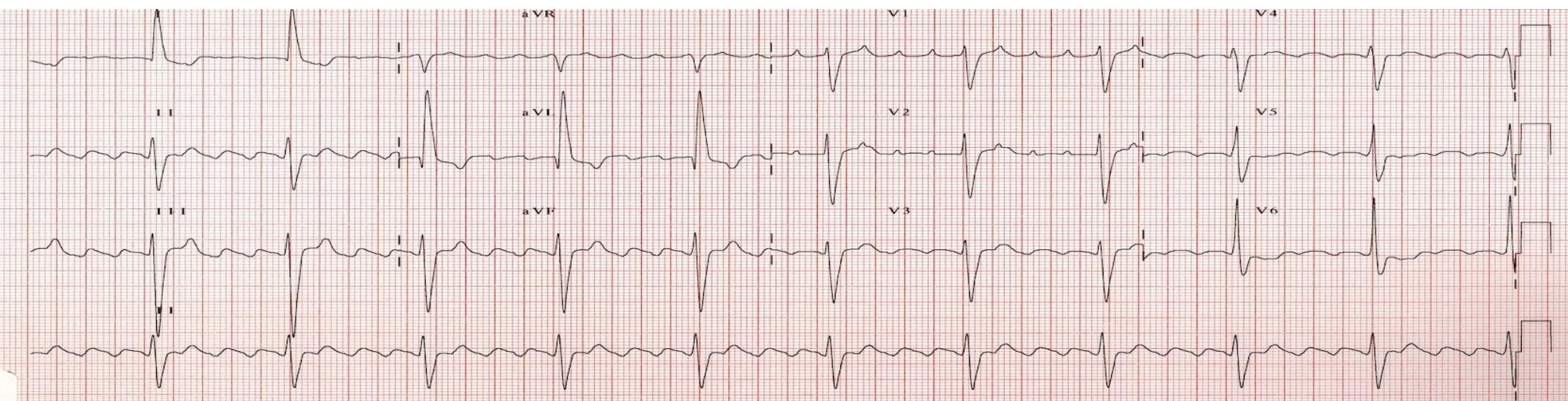
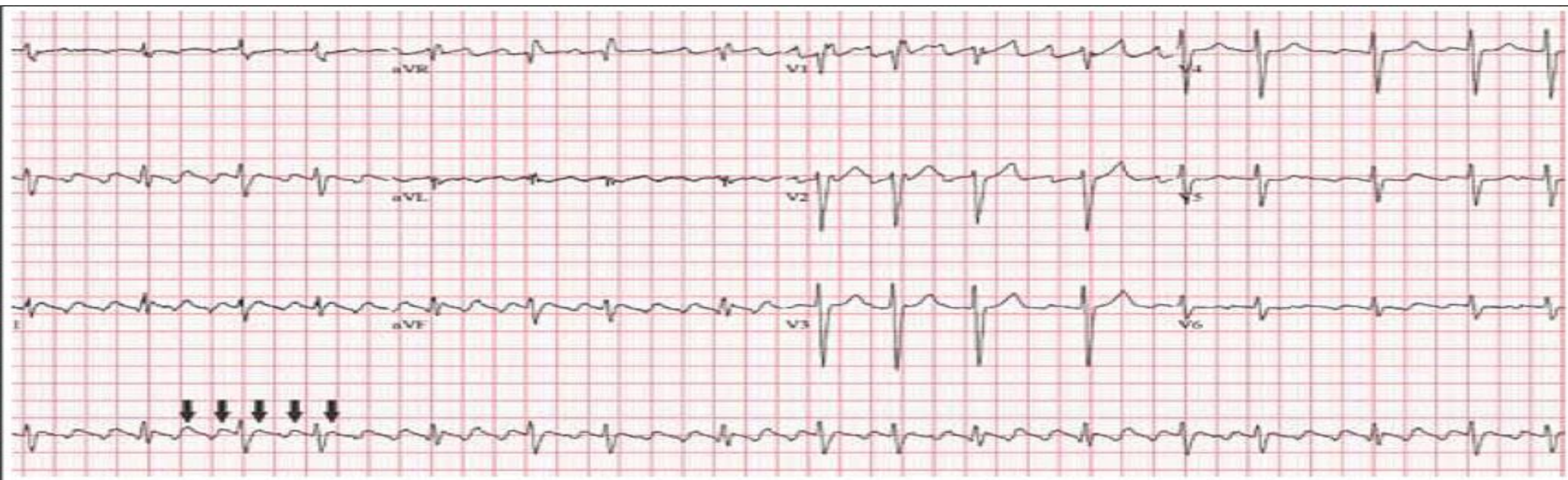
- Aritmie rara la copii
- Se poate intalni in perioada neonatala
- Conduita si tratament asemanator FiA
- Rata de conversie medicamentoasa la RS relativ scazuta

Flutter atrial

- Prezenta undelor F (“dinti de fierastrau”)
- Absenta undelor P
- Ritmul poate fi – regulat (bloc A-V fix)
 - neregulat (bloc A-V variabil)



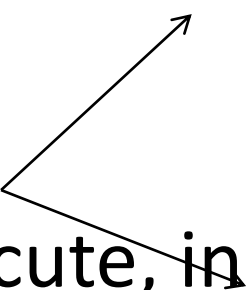
Flutter atrial



Tahicardie ventriculara (TV)

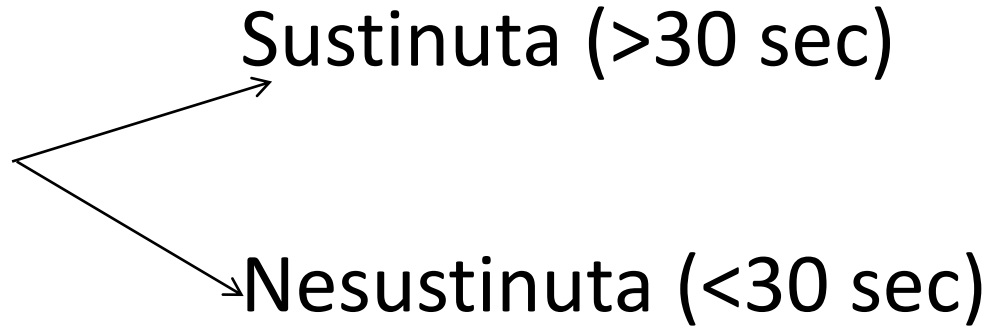
- Doar 5% din tahicardiile cu QRS larg la copii sunt TV!!
hemodinamic stabile

hemodinamic instabile (la frecvente crescute, în disfuncții preexistente VS)



Mecanism principal: reintrarea

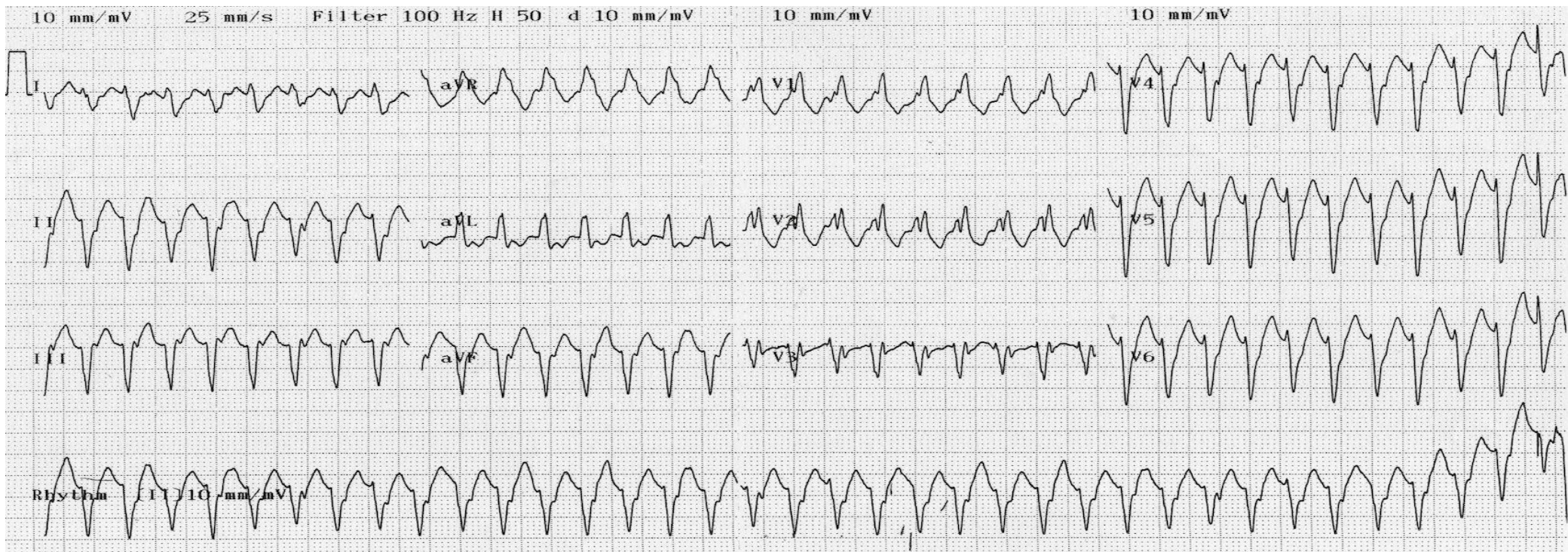
Tahicardie ventriculara



- Pe cord indemn
- Pe cord patologic (cardiomiopatii, ischemie, miocardita, etc)

Tahicardia ventriculara

- Tahicardie regulata cu QRS larg(frecv.150→300/min)
- Unde P vizibile cu dificultate, fara legatura cu QRS



Principii de tratament aritmii (1)

- Scopul tratamentului:
 - inlaturarea simptomelor
 - prevenirea complicatiilor (cardiomiopatia tahiaritmica, trombozele intracardiace)
- Tratament non-farmacologic – manevre vagale (in TPSV)
- Medicatia antiaritmica – pentru conversie
 - pentru preventie

Principii de tratament aritmii (2)

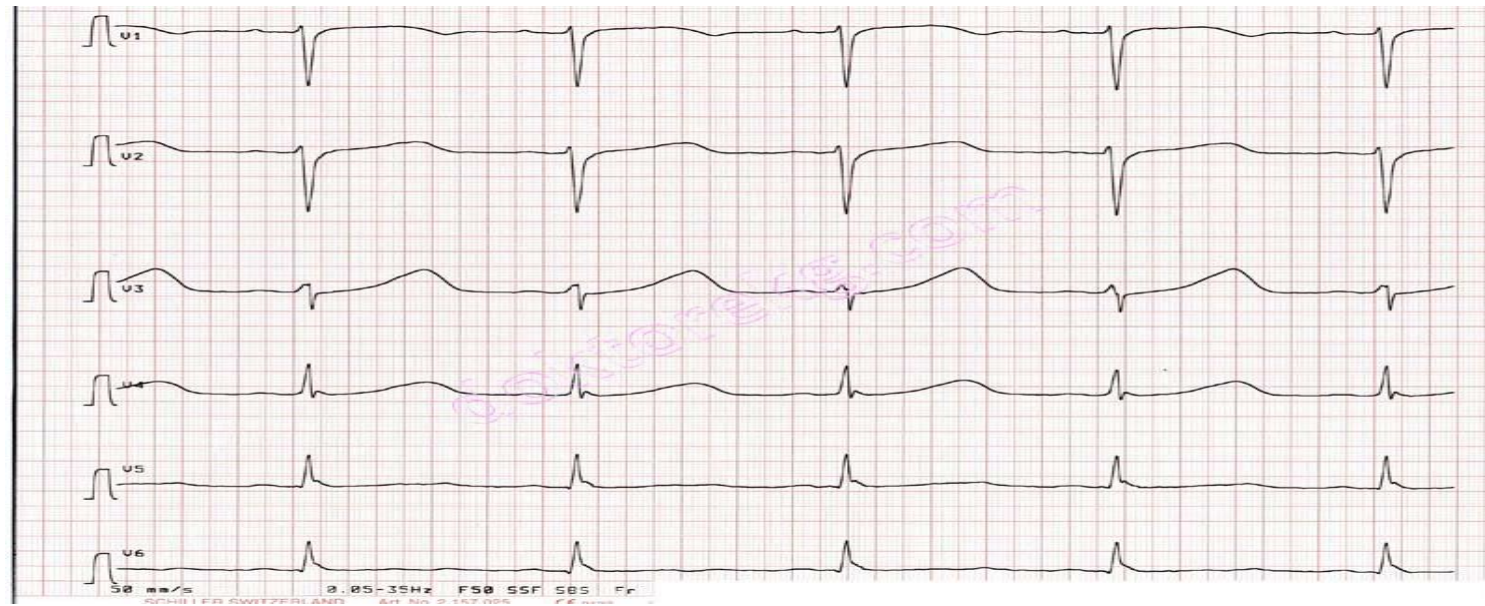
- *Soc electric extern* - aritmii prost tolerate hemodinamic
 - aritmii rezistente la tratament
- *Defibrilator implantabil* - dupa stop cardiac resuscitat de cauza aritmica
 - risc inalt de moarte subita aritmica
- *Ablatie prin radiofrecventa* (aritmii ventriculare si supraventriculare rezistente la tratament sau cu risc de moarte subita)
- *Tratament anticoagulant* – la pacienti selectati cu FiA/FIA

Sindrom de QT lung (1)

- Boala genetica
- Una din cauzele de moarte subita la copii si tineri
- Frecvent – istoric familial pozitiv (sincope/moarte subita la membrii ai familiei)
- Poate fi prezent in cadrul unor sindroame genetice cu surditate congetitala ---→ obligatoriu EKG!

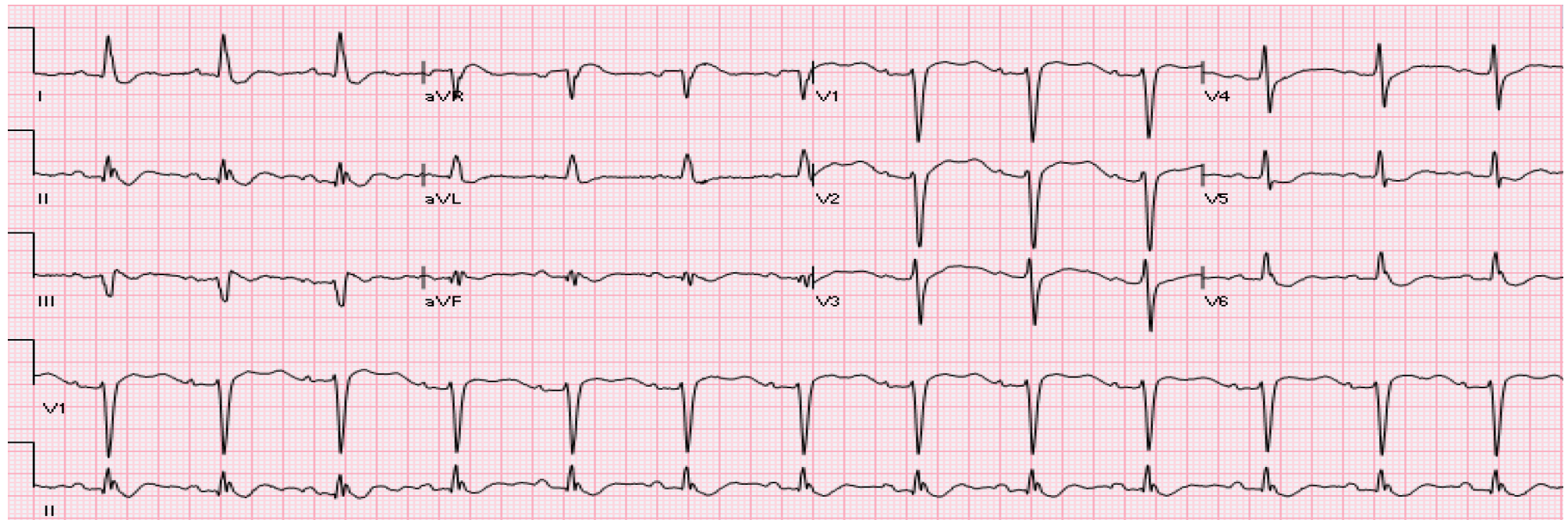
Sindrom de QT lung (2)

- Clinic: sincope inexplicabile/ crize convulsive/ moarte subita
- Tratament: beta- blocante/ defibrilator implantabil in cazuri selectionate



Diselectrolitemii

- HipoK ($<2,5$ mmol/l)
 - unda U proeminenta
 - QT/QU alungit
 - ST subdenivelat
 - unda T bifazica
 - risc de torsada varfurilor



Hiperpotasemia

>6 mmol/l

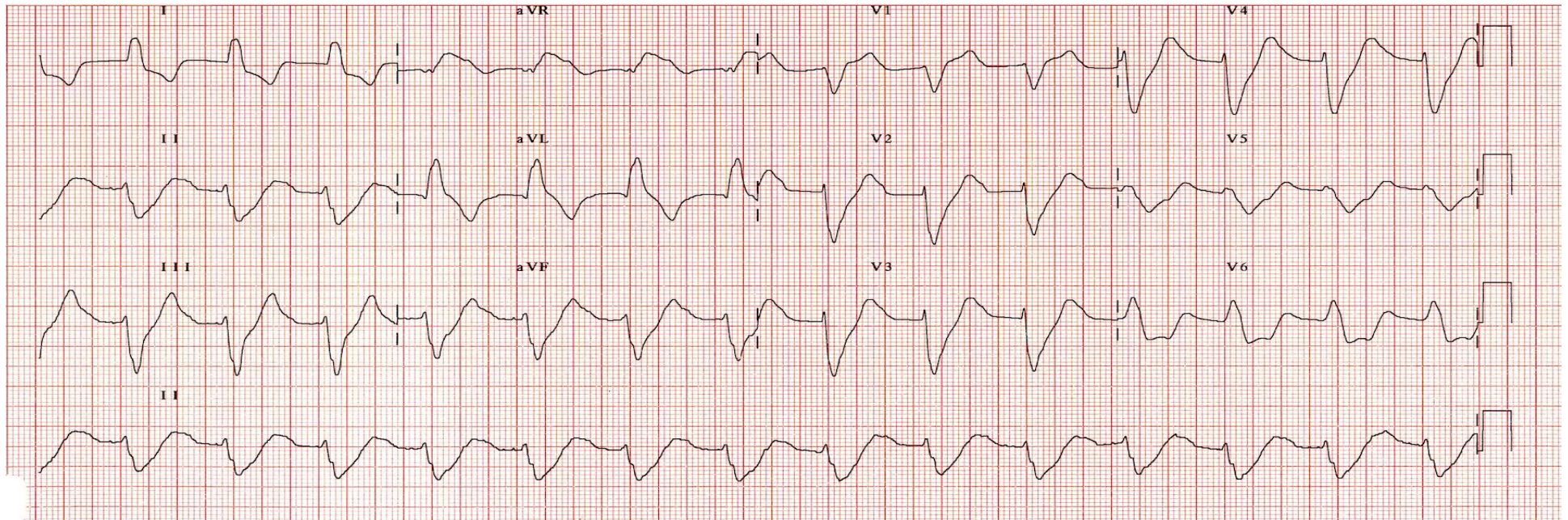
>7,5 mmol/l

- Unde T inalte, ascutite
- Largire QRS
- Alungire PR

Disparitia undelor P

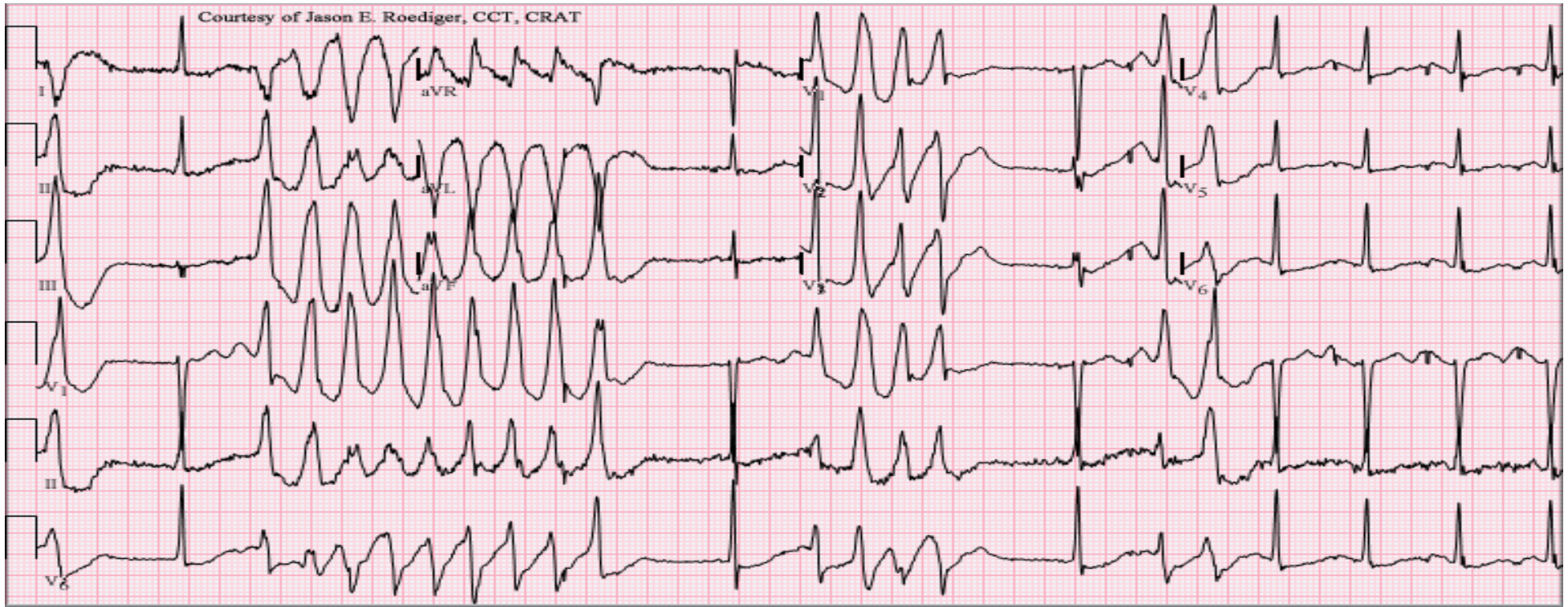
QRS larg, bifazic, bizar

Asistola



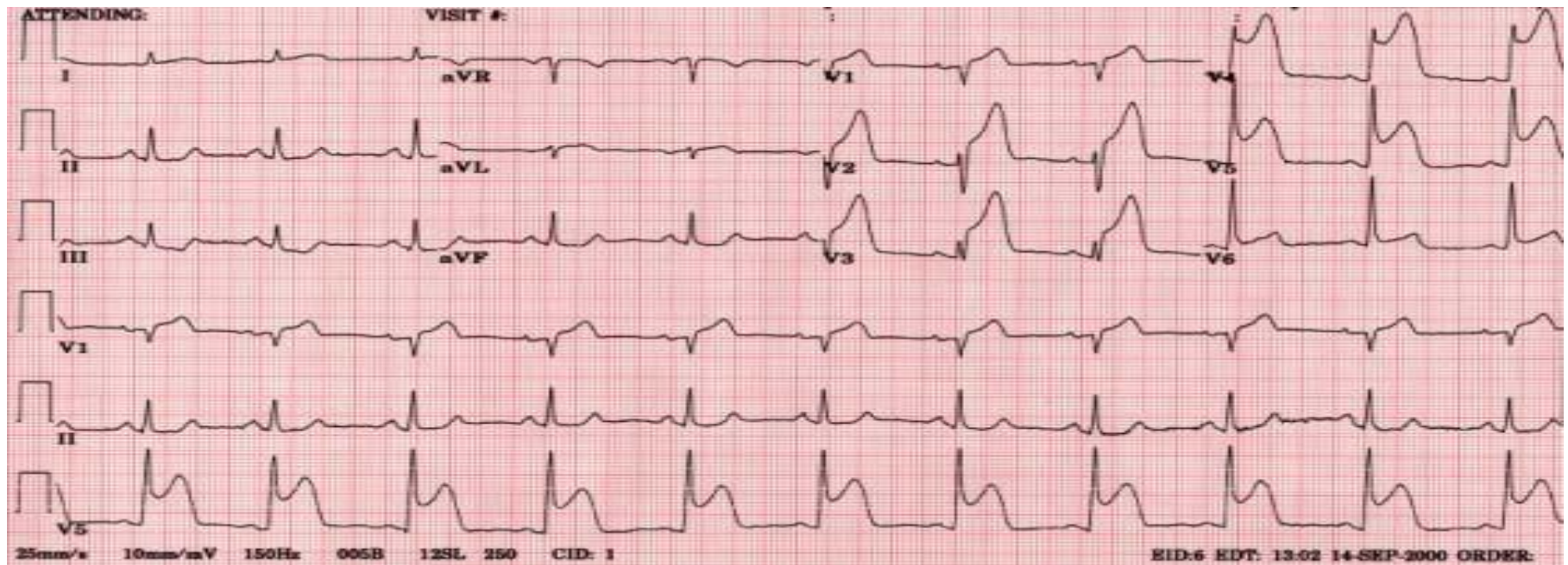
Torsada varfurilor

- Cauze frecvente: hipok, sindrom de QT lung
- Se poate remite spontan sau poate degenera in FV



Infarct miocardic acut

- Semnul EKG patognomonic: supradenivelare segment ST
- Diagnostic diferential: miocardita/pericardita



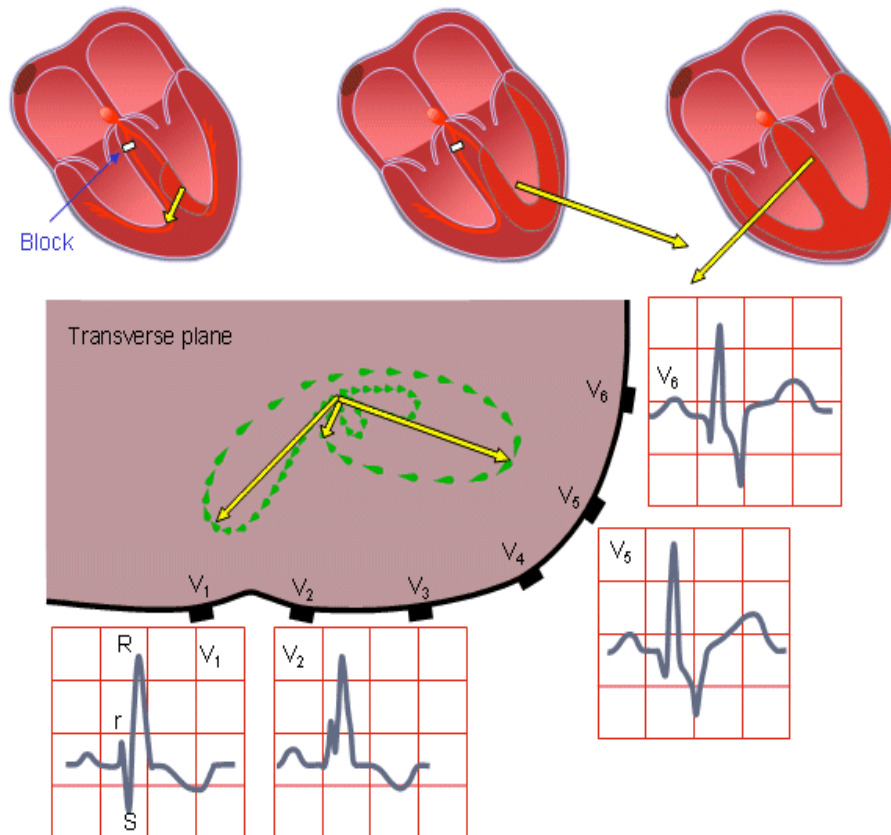
Bloc major de ramura

Dreapta

Stanga

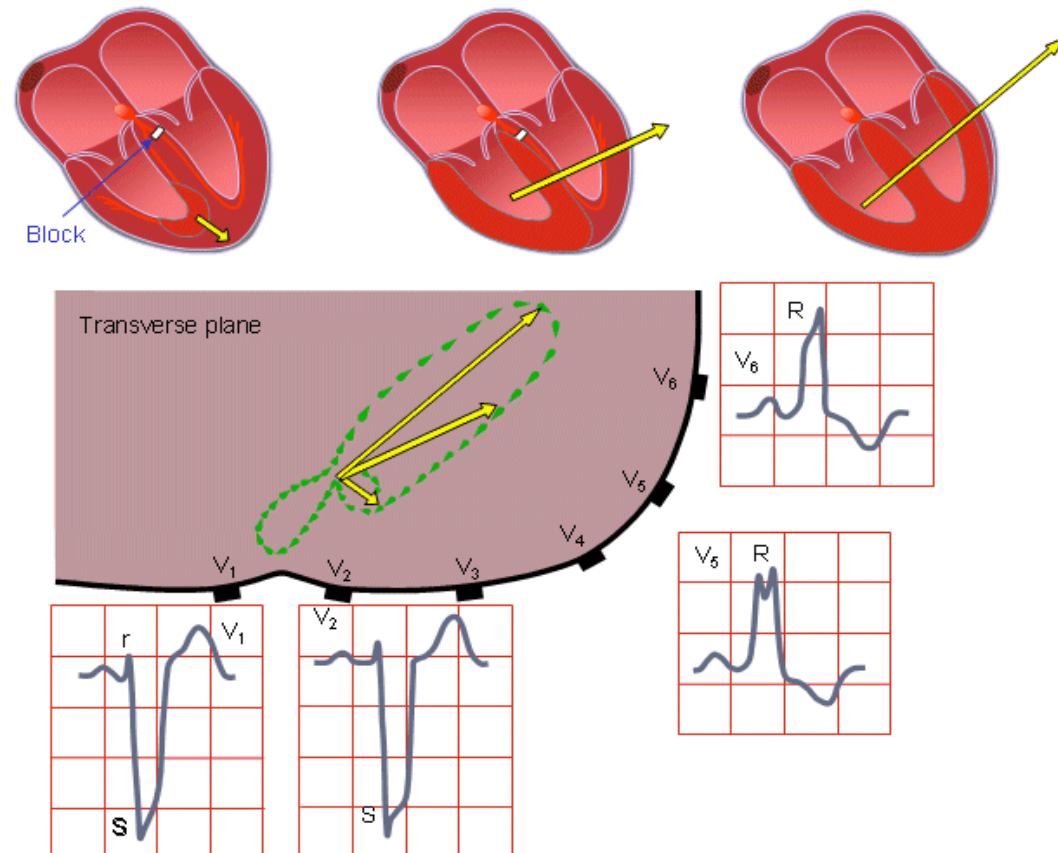
RIGHT BUNDLE-BRANCH BLOCK

QRS duration greater than 0.12 s
Wide S wave in leads I, V5, and V6



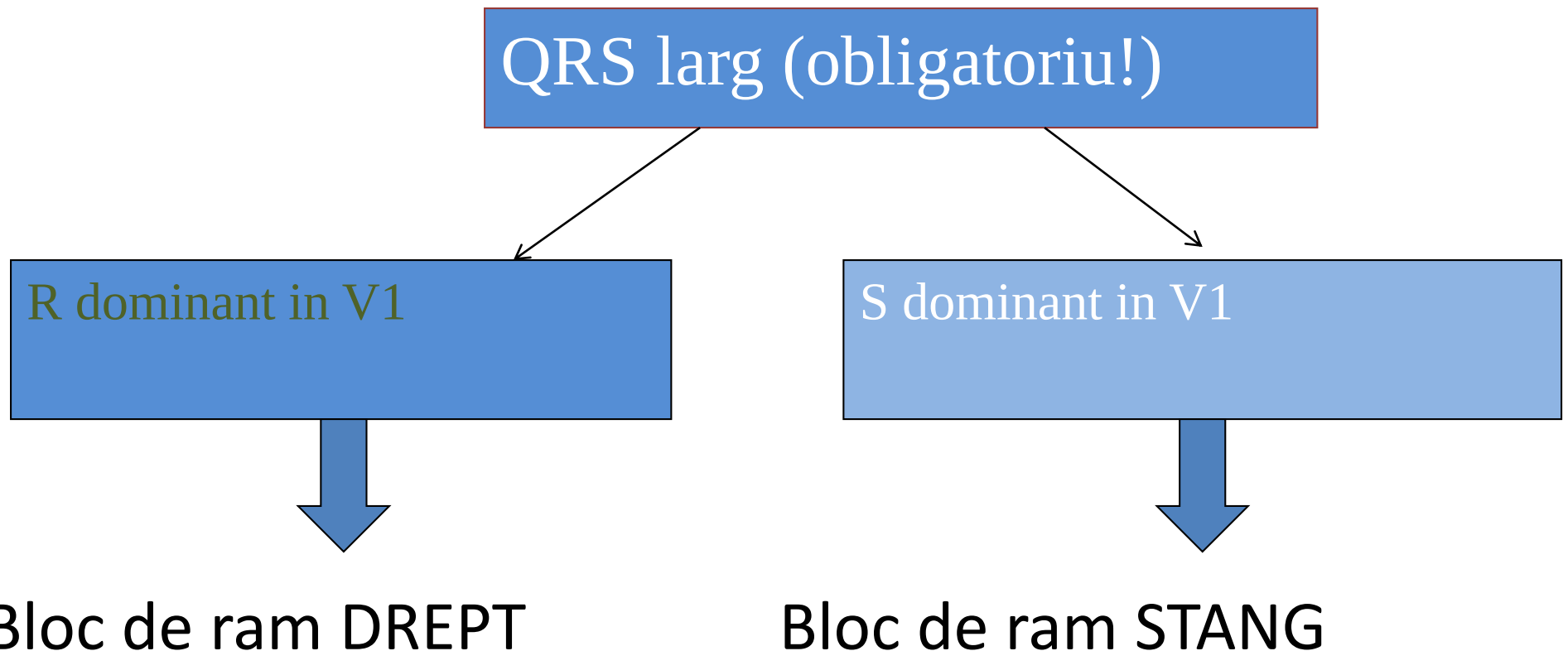
LEFT BUNDLE-BRANCH BLOCK

QRS duration greater than 0.12 s
Wide S wave in leads V1 and V2, wide R wave in V5 and V6



Bloc major de ramura

- Principiu orientativ:



Bradycardia sinusala

- 0 – 3 years: <100 bpm
- 3 – 9 years: < 60 bpm
- 9 – 16years: < 50 bpm

Bradycardia sinusala

- Cauze:
 - non- cardiace - reactii adverse medicamentoase
(A!! Toate antiaritmicele pot da bradicardie!)
 - tonus vagal crescut
 - hipotiroidie
 - afectiuni cerebrale
 - hiper K

Bradycardia sinusala

Cauze cardiace: - afectiuni ale sistemului de conducere

- miocardite

- dupa chirurgie cardiaca

- ischemie miocardica

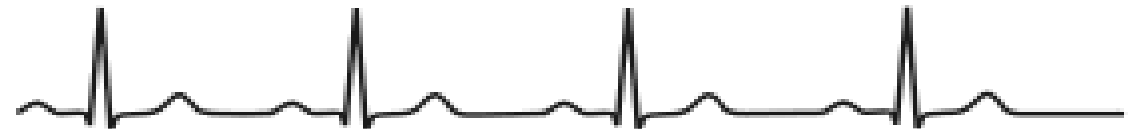
Blocurile atrio-ventriculare

- Intarzierea/blocarea impulsului electric la nivelul sistemului de conducere



Normal

- Grad I
- Grad II



First-Degree AV Block

- tip 1

- tip 2



Second-Degree AV Block (2:1)

Grad III (complet)



Third-Degree AV Block

BAV grad I

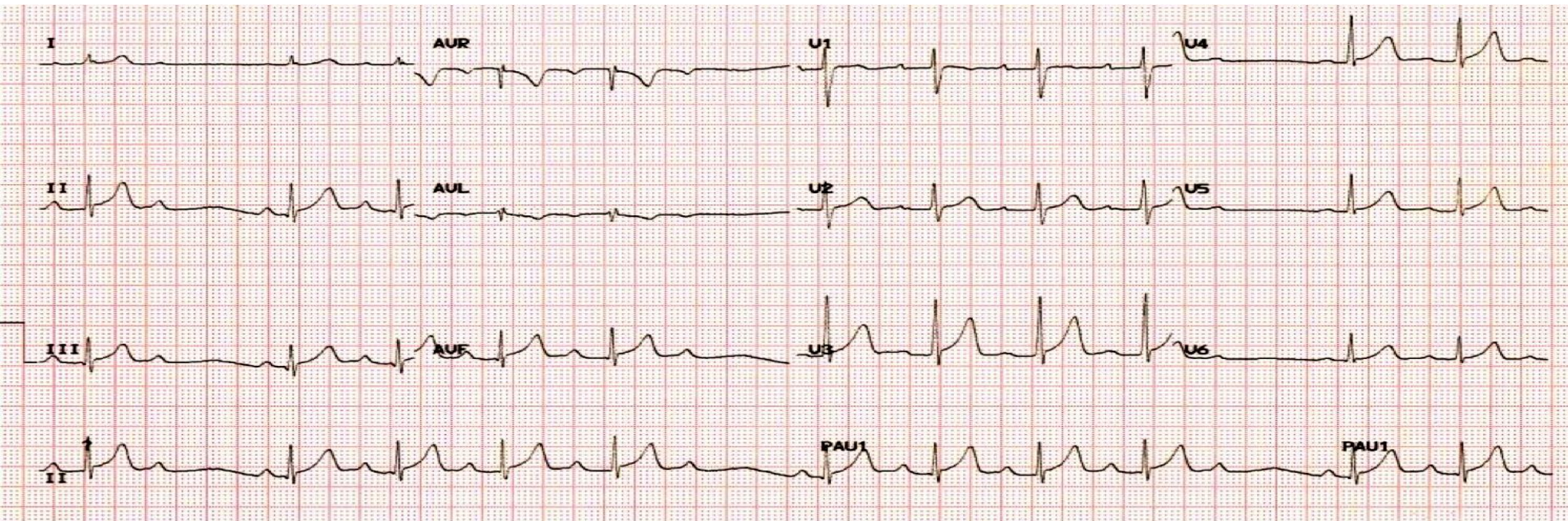
- Interval PR peste limita superioara a normalului pentru varsta
- Poate fi o varianta de normal (tonus vagal crescut, sportivi)
- Frecvent in hiper K, tratamente antiaritmice (B-blocant, digoxin)
- Fara simptomatologie
- Nu necesita tratament



Bloc atrioventricular gr.II

Tip 1 (Wenckebach)

- alungirea progresiva a intervalului PR, pana la blocarea unei unde P (cu posibilitatea reluarii ciclului)

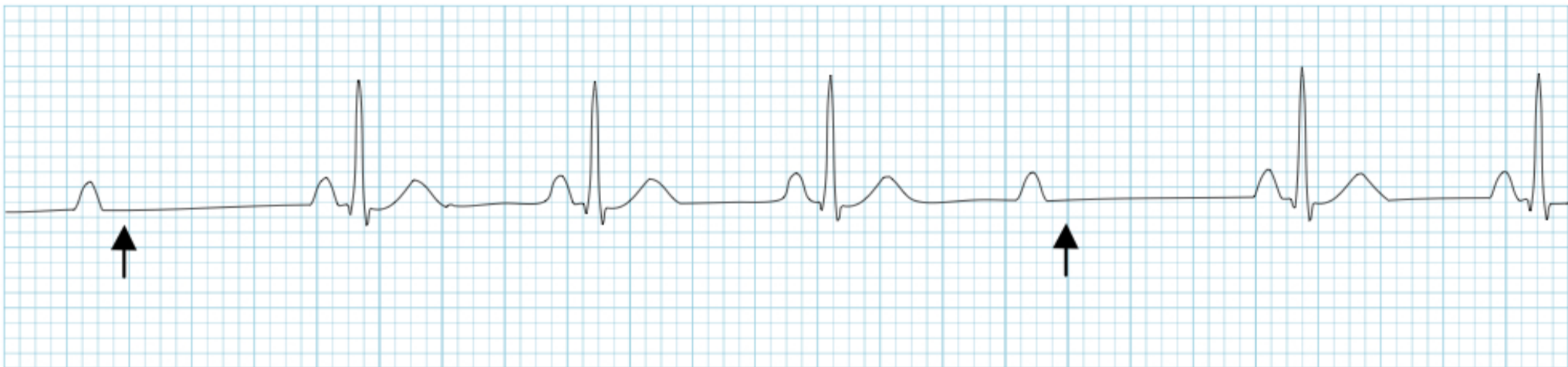


BAV gr.II – tip 1

- Frecvent asimptomatic
- Poate fi prezent fiziologic tranzitor la tineri (in special nocturn)
- Se remite la administrarea de atropina
- De obicei este asimptomatic si nu necesita tratament
- Impune monitorizare Holter EKG pt. depistarea asocierii unor grade mai avansate de bloc
- Raman sub urmarire cardiologica

BAV grad II – tip 2

- Unde P intermitent neconduse la ventricul (neurmata de QRS)
- Intervalul PR ramane normal
- Frecvent: - congenital
- dupa chirurgie cardiaca



BAV grad II

- In general symptomatic (dispnee de effort, sincope)
- Necesita internare si ulterior urmarire cardiologica
- Uneori, functie de contextul clinic, are indicatie de pace-maker
- Are potential de evolutie catre BAV total

BAV tip II de grad inalt

- AV foarte scazuta
- Raport P/QRS $\neq > 3/1$
- Spre deosebire de BAV total, exista intermittent unde P conduse la ventricul

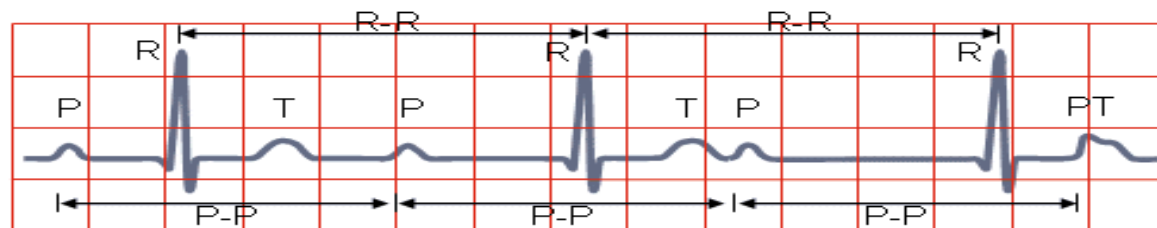
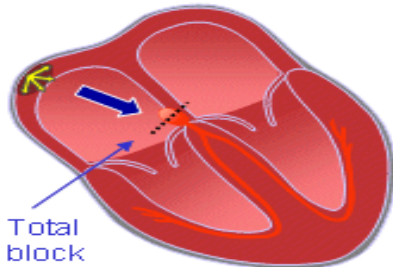


BAV grad III (complet)

- Unde P fara legatura cu QRS (unde P neconduce la ventricul)
- Rim ventricular – junctional – QRS ingust, frecventa mai convenabila
 - ritm de scapare ventricular – QRS larg, frecventa mai joasa

A-V BLOCK, THIRD DEGREE

- Impulses originate at AV-node and proceed to ventricles
- Atrial and ventricular activities are not synchronous

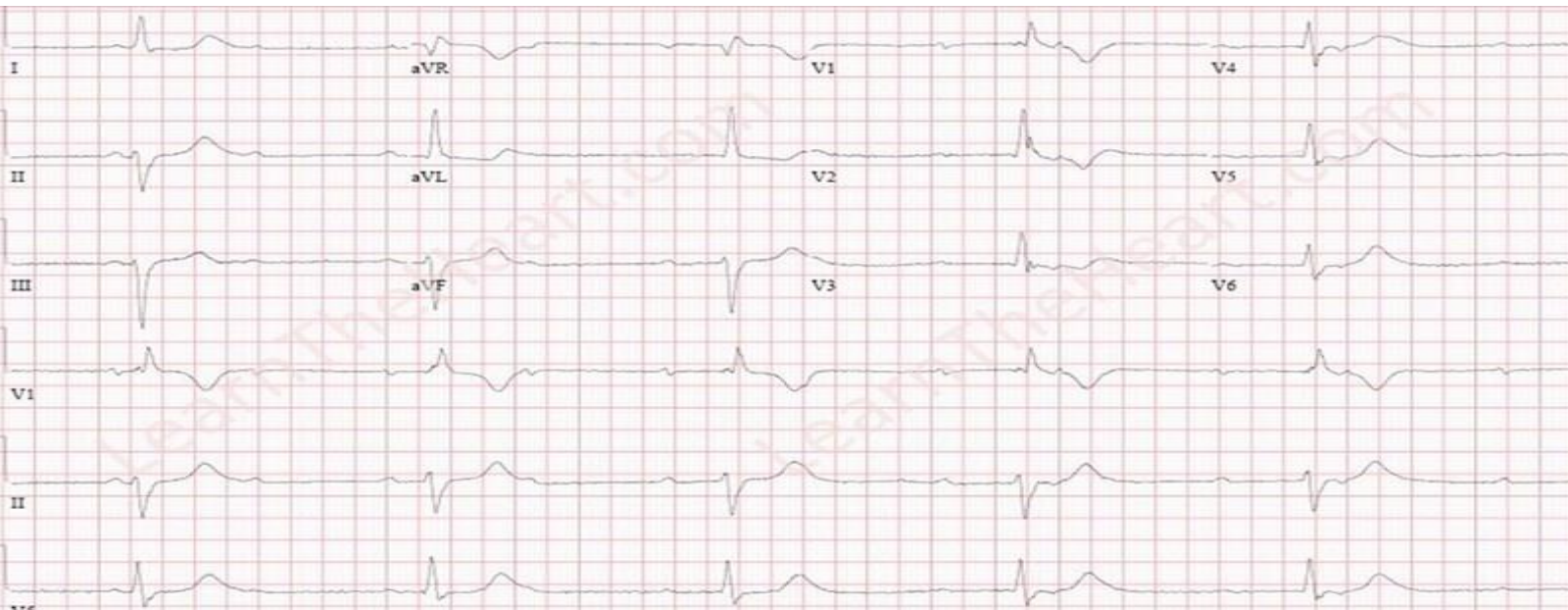


P-P interval normal and constant,
QRS complexes normal, rate constant, 20 – 55 /min

BAV complet

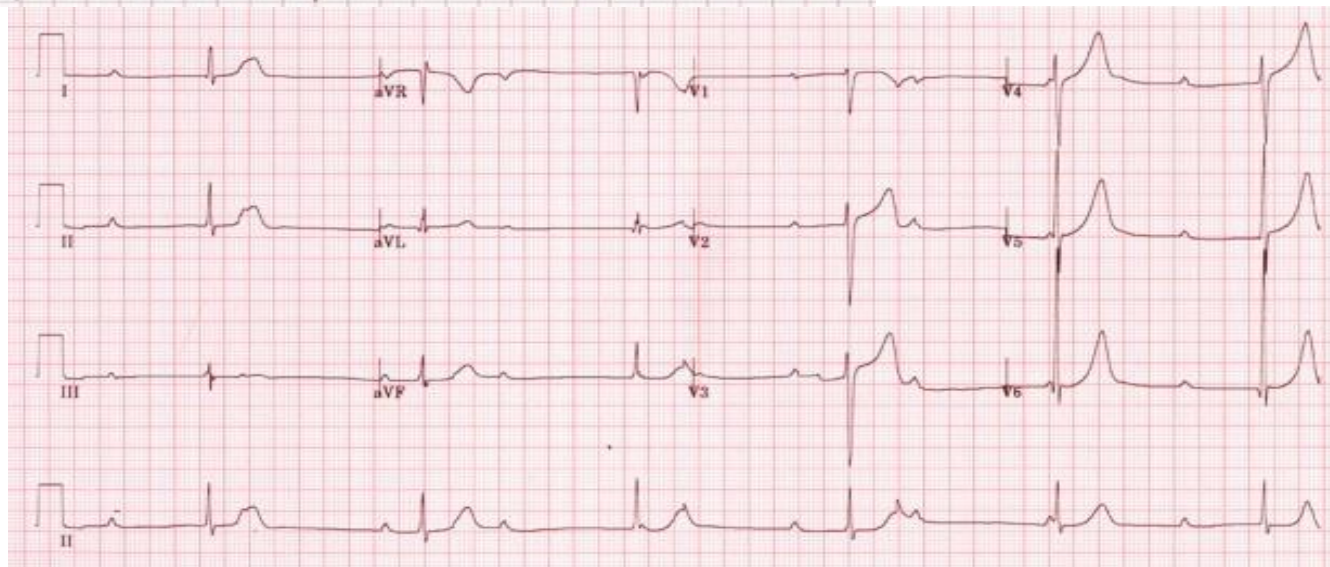
- La prima prezentare necesita obligatoriu internare
- Are risc de moarte subita
- Indicatia de cardio-stimulare se pune functie de tabloul clinic si de rezultatele monitorizarii Holter
- In general simptomatic (sincope, dispnee de effort)

BAV complet



larg

- QRS ingust



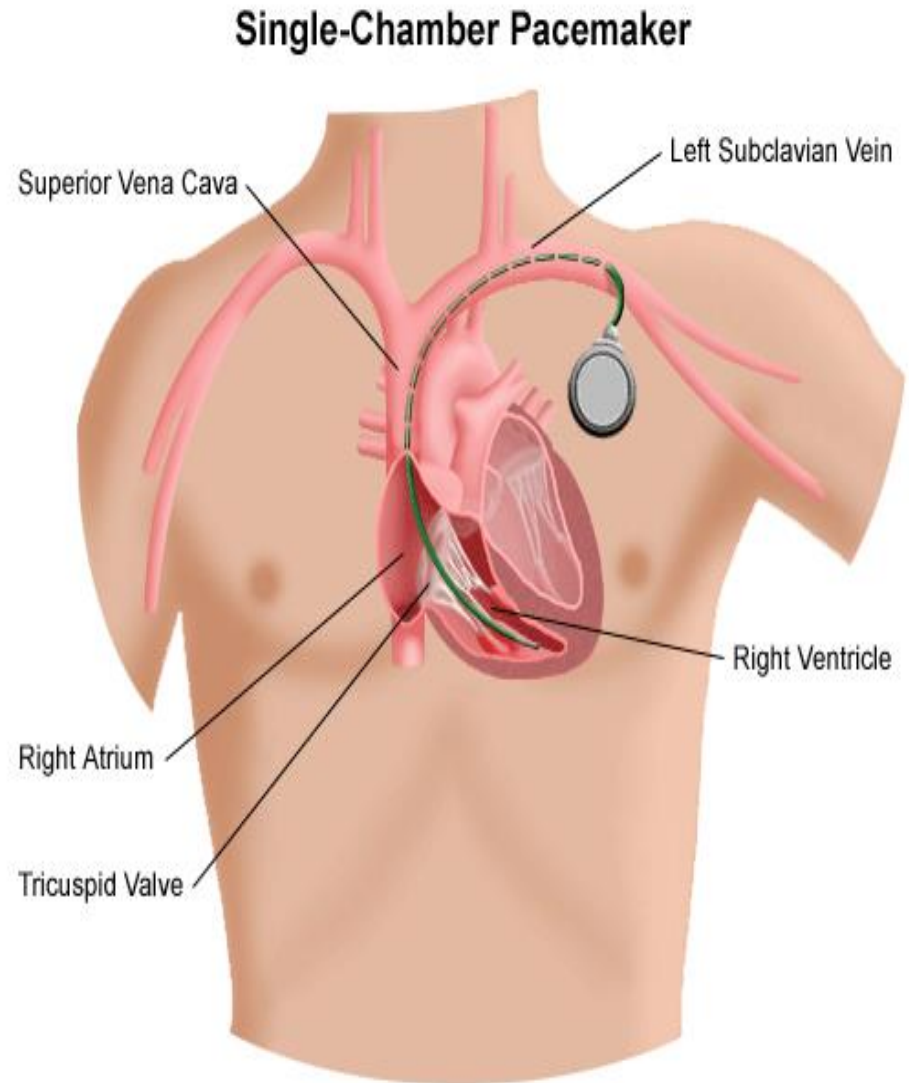
Principii de tratament ritmuri rare

- N.B. – contraindicate toate medicamentele antiaritmice!! (potenteaza bradicardia si tulburarile de conducere)
- Se trateaza eventualele cauze (intoxicatii, medicatii favorizante, infectii, inflamatie dupa chirurgia cardiaca,etc)
- Pace-maker (stimulator cardiac) – indicatii clare conform ghidurilor europene

Pace maker (1)

- Preia functia de centru de comanda a impulsului electric
- Se poate implanta la toate varstele(inclusiv nn)

Salvator de viata!!!



Pace maker - indicatii

- Nn/sugar cu - AV<55/min si cord normal
 - AV,70/min si MCC
- Copil>1 an cu - AV<50/min
 - insuficienta cardiaca
 - disfunctie VS
 - pauze peste 3 sec.

Pace – maker permanent

- Electrozi epicardici
 - frecvent la copii cu $G < 10$ kg
 - device implantat in regiunea abdominala
- Electrozi endocardici
 - copii mari si adulti
 - dispozitiv in regiunea sub-claviculara (subcutanat)
 - implantat pe cale transvenoasa



Pace maker temporar

- electrozi epicardici (dupa chirurgie cardiaca)
- Electrozi endocardici/transtoracici (in cazul implantarii in urgenta pt. tulburari de conducere cu risc vital)



Pace maker temporar - indicatii

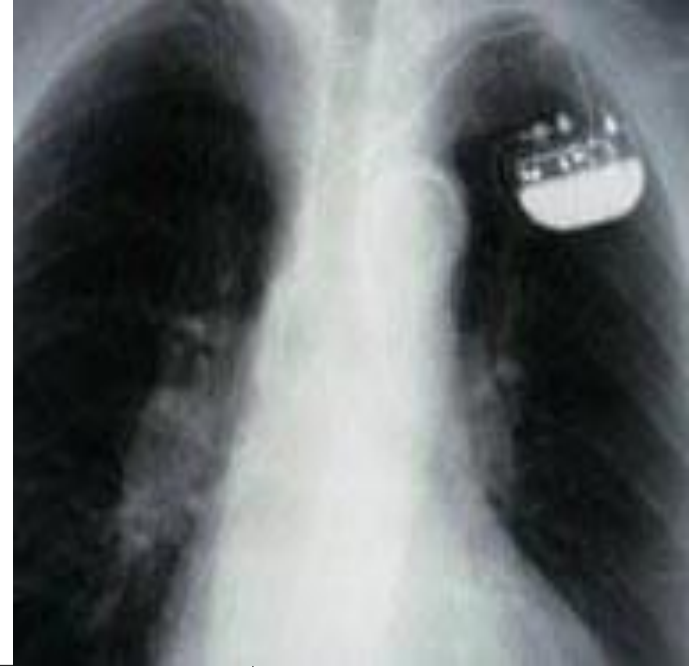
- Tulburari de conducere cu potential reversibil:
 - dupa chirurgie cardiaca
 - hiperK
 - miocardite
 - intoxicatii medicamentoase
- In urgenta – tulburari de conducere permanente cu risc vital – pana la implantarea stimulatorului permanent

Pace maker - urmarire

- Controale periodice la electrofiziolog
- Se monitorizeaza - parametrii de pacing/sensing
 - durata de viata a generatorului

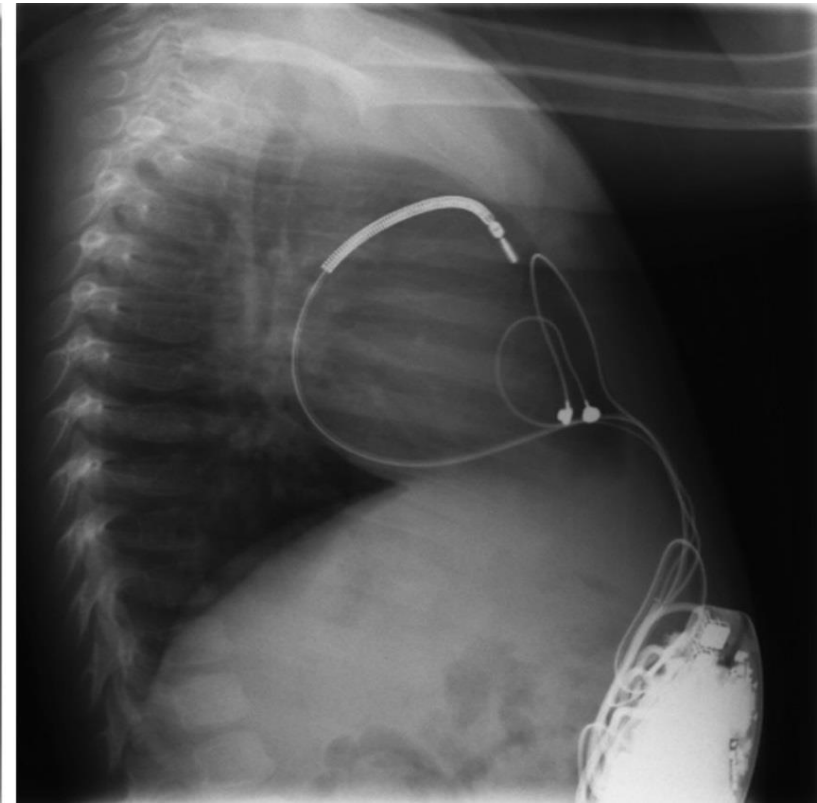
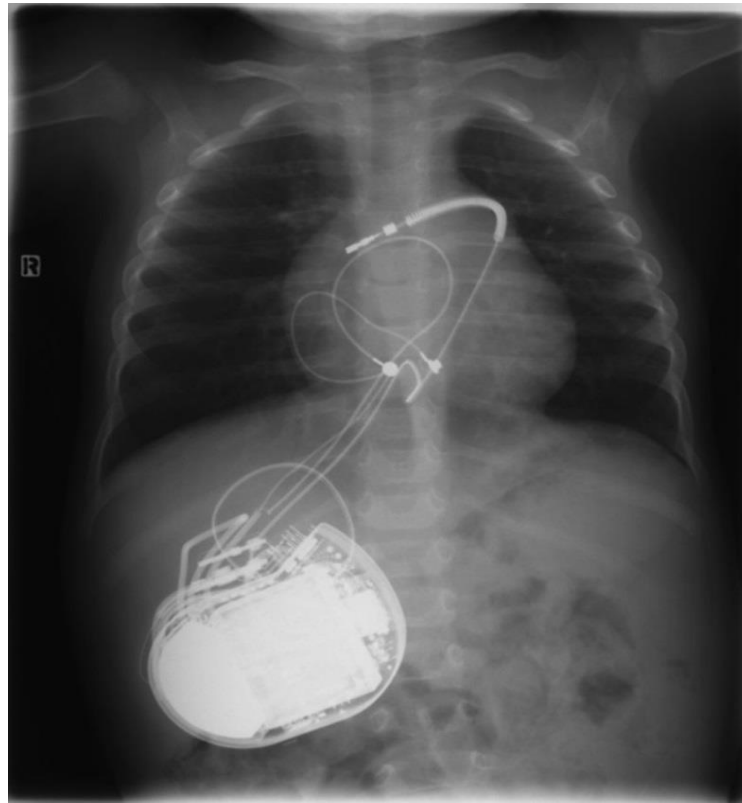


Pace maker



Defibrilator implantabil

- Salvator de viata in anumite patologii aritmice!!!
- Genereaza soc electric in cazul depistarii unor aritmii cu potential letal, stapand aritmia

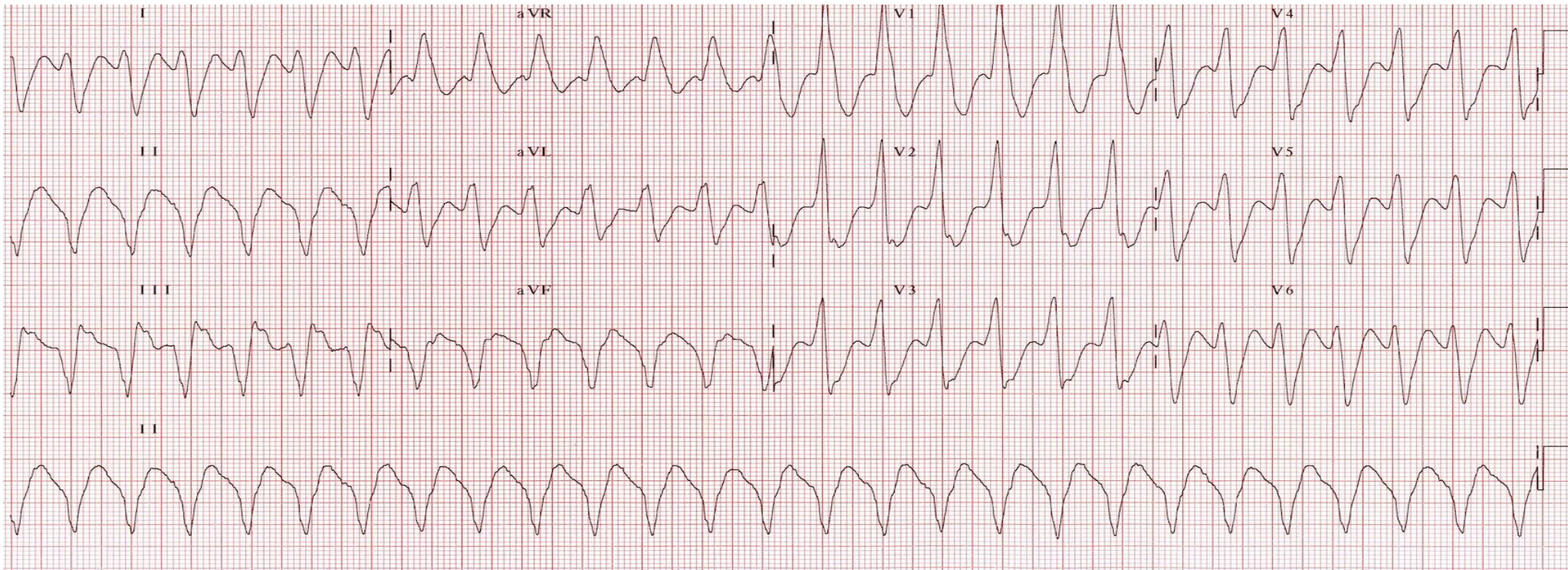


Defibrilator implantabil - indicatii

- Dupa un stop cardio-respirator resuscitat (de cauza aritmica) nedatorat unei cauze reversibile
- Tahicardii ventriculare sustinute simptomatice (fara solutie terapeutica alternativa) la:
 - cei cu insuficienta cardiaca severa
 - cei cu MCC severe

Caz clinic 1

- Adolescent 15 ani, prezentat pentru o sincopa survenita pe terenul de fotbal
- Fara antecedente patologice



Conduita corecta?

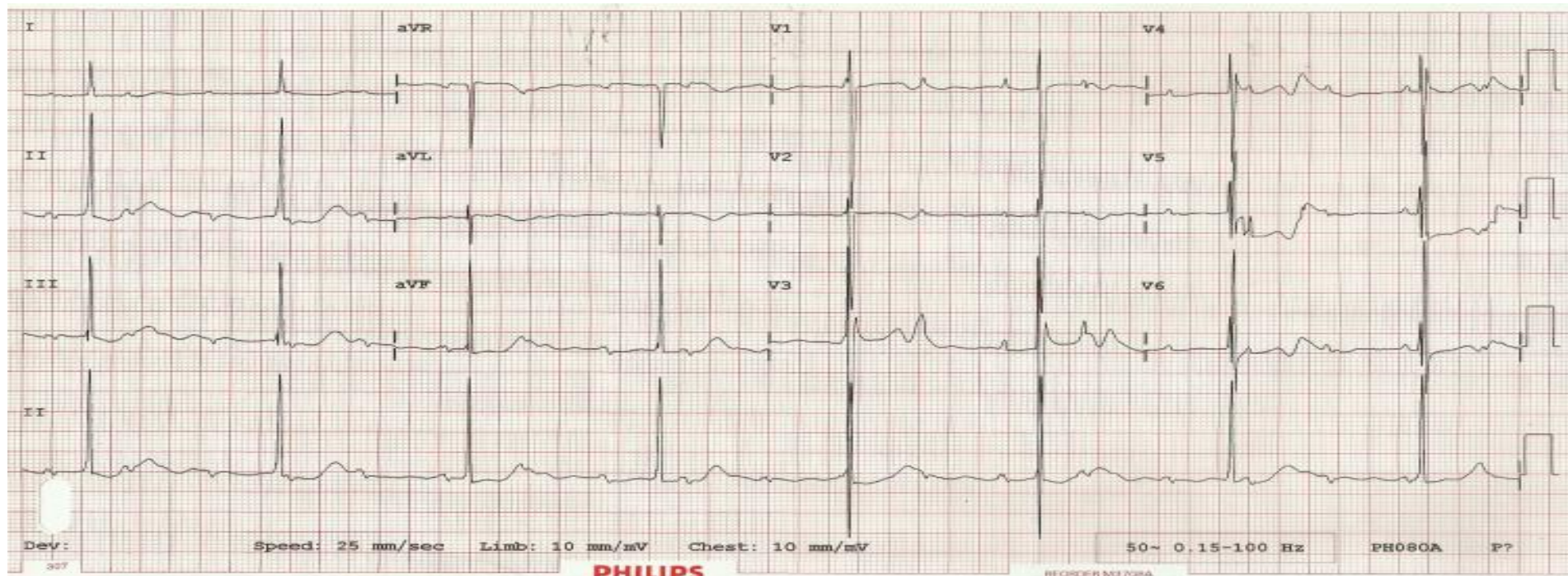
- Internare de urgenta?
- Programare la o consultatie in ambulator?
- Stimulator cardiac?
- Defibrilator implantabil?
- Conversie medicamentoasa?

Diagnostic?

- TPSV?
- Tahicardie ventriculara?
- Aspect normal?
- Fibrilatie atriala?

Caz clinic (2)

- Nou nascut 24 zile
- Prezentat pentru inapetenta, varsaturi intermitente, lipsa tonusului si polipnee la supt



Conduita la prezentare?

- Internare de urgenta?
- Administrare de digoxin pentru sustinerea cordului?
- Indicatie de stimulator cardiac?
- Tratament antiaritmie?

Diagnostic?

- Bradicardie sinusala?
- BAV complet?
- Hipopotasemie?
- EKG normal?

Pentru voi...

Smart enough to
be a doctor...

Chose to be a nurse.

