



Advance Aritmia Management

(Cardiac Arrest, Tachicardia, Bradikardia)

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PJT RSUPN. Dr Cipto Mangunkusumo

**Disampaikan Pada Seminar & Simulasi Keperawatan
Bandung, 07 Maret 2020.**

Curriculum Vitae

Nama : Ns. Yudi Elyas, S.Kep
NIRA : 31730118302
Lama Bekerja : 16 Tahun
Riwayat Jabatan : 1. Ka.Ruang ICU bedah Jantung PJT RSCM
2. Supv. ICCU,ICU bedah jantung, RR PJT RSCM
Jabatan Saat ini : PJ Pelayanan ruang Intensif RSCM Jakarta
Tlp / Instagram : 081316006831 / @YUDI ELYAS



Pendidikan :

- Ners Keperawatan FIK UI
- Pendidikan ICU Bedah Jantung (CCNP) Institute Jantung Negara (IJN) Malaysia

Pelatihan :

- Kardiologi Dasar
- Intensive Care Unit (ICU)
- BLS & ACLS AHA 2015
- TOT BLS & ACLS AHA
- Asesor Keperawatan
- TOT Keperawatan

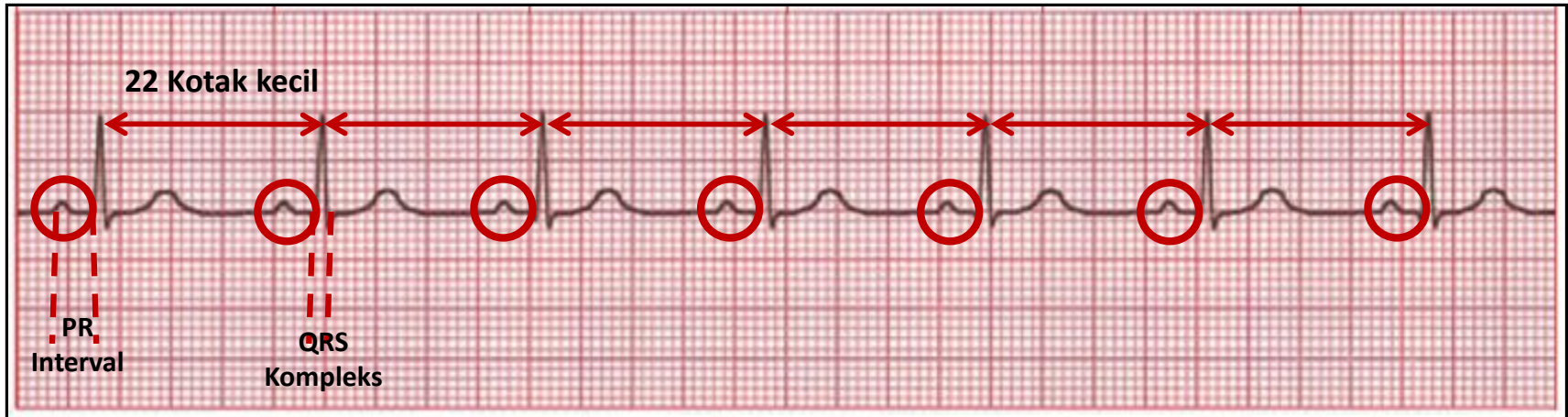
Trainer :

- BLS & ACLS Certified by AHA
- *Basic Trauma Cardiac Life Support* (BTCLS)
- Pelatihan ICU (RSCM & HIPERCCI)
- Pelatihan *Code Blue* system di RS
- Pelatihan Interpretasi EKG
- Seminar & Workshop Keperawatan

Organisasi :

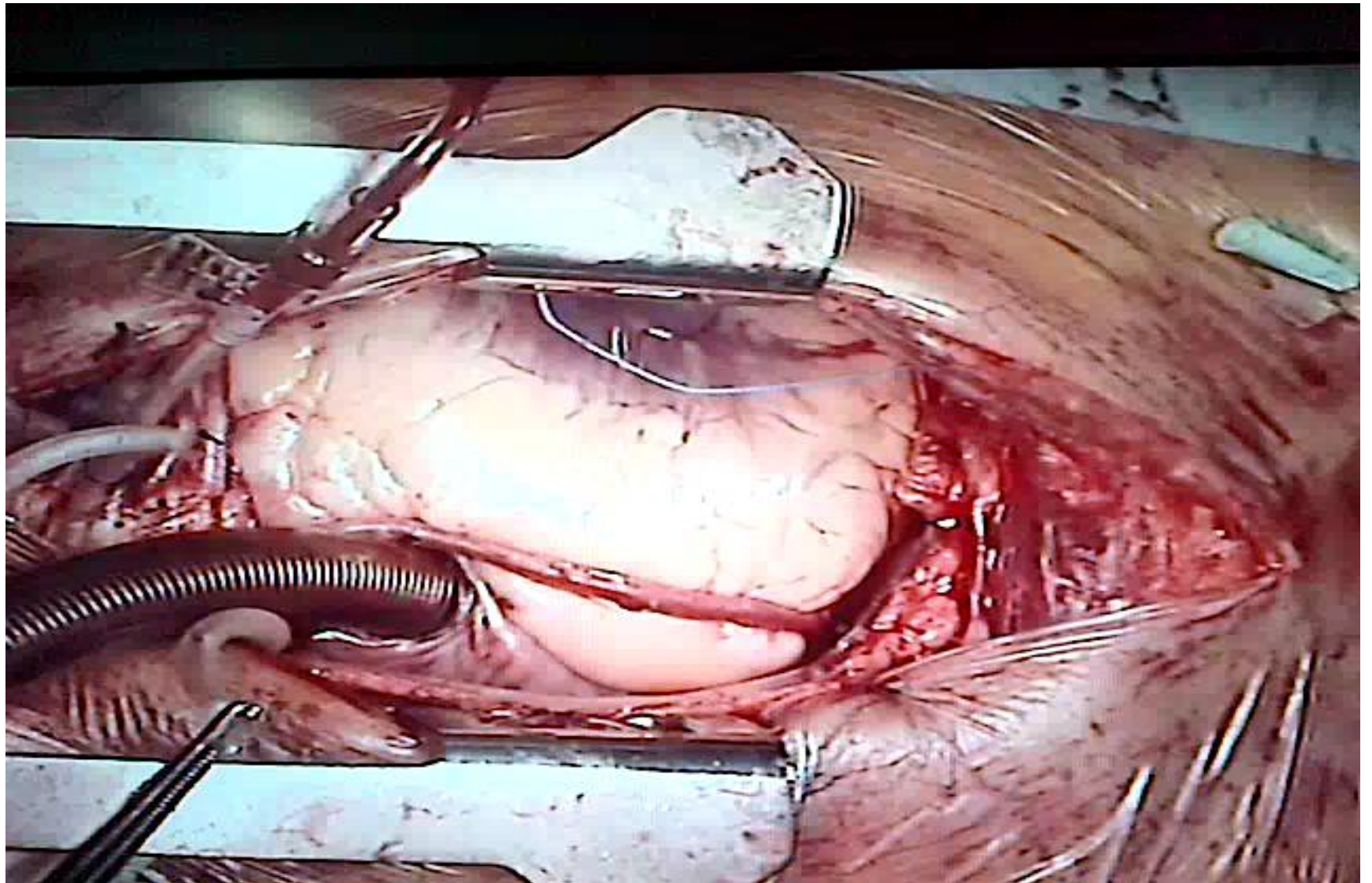
- PPNI
- HIPERCCI DKI (Pengurus)
- INKAVIN (Anggota)
- Provider BTCLS (JMS 119 JKT)

SINUS RHYTHM



- Berasal dari nodus SA
- Irama teratur
- Frekwensi jantung (HR) antara 60 -100 x/menit (Dewasa)
- Gelombang P normal , setiap gelombang P selalu diikuti gelombang QRS dan T
- Interval PR normal (0,12 -0,20detik)
- Gelombang QRS normal (0,06 – 0,12 detik)
- Semua gelombang sama

Irama EKG yang tidak memenuhi kriteria diatas disebut dengan Arritmia / Disritmia



Aritmia

Definisi

Aritmia adalah irama jantung yang menyimpang dari irama sinus normal, yang dapat disebabkan oleh **gangguan dalam pembentukan impuls** atau **gangguan dalam konduksi impuls**.

Deteksi Aritmia

Tekhnik Pemeriksaan

- **Palpasi :**
 - Kuat / lemah
 - Teratur / tidak teratur
- **Auskultasi :**
 - Jelas/ tidak jelas
 - Suara jantung tambahan (gallop/murmur jantung)
- **Pemasangan Monitor**
- **Interpretasi EKG :**
 - Irama jantung
 - Frek. HR
 - Jenis Aritmia

Palpation of arterial pulses



Radial



Brachial



Femoral



Popliteal



Dorsalis pedis



Posterior tibial

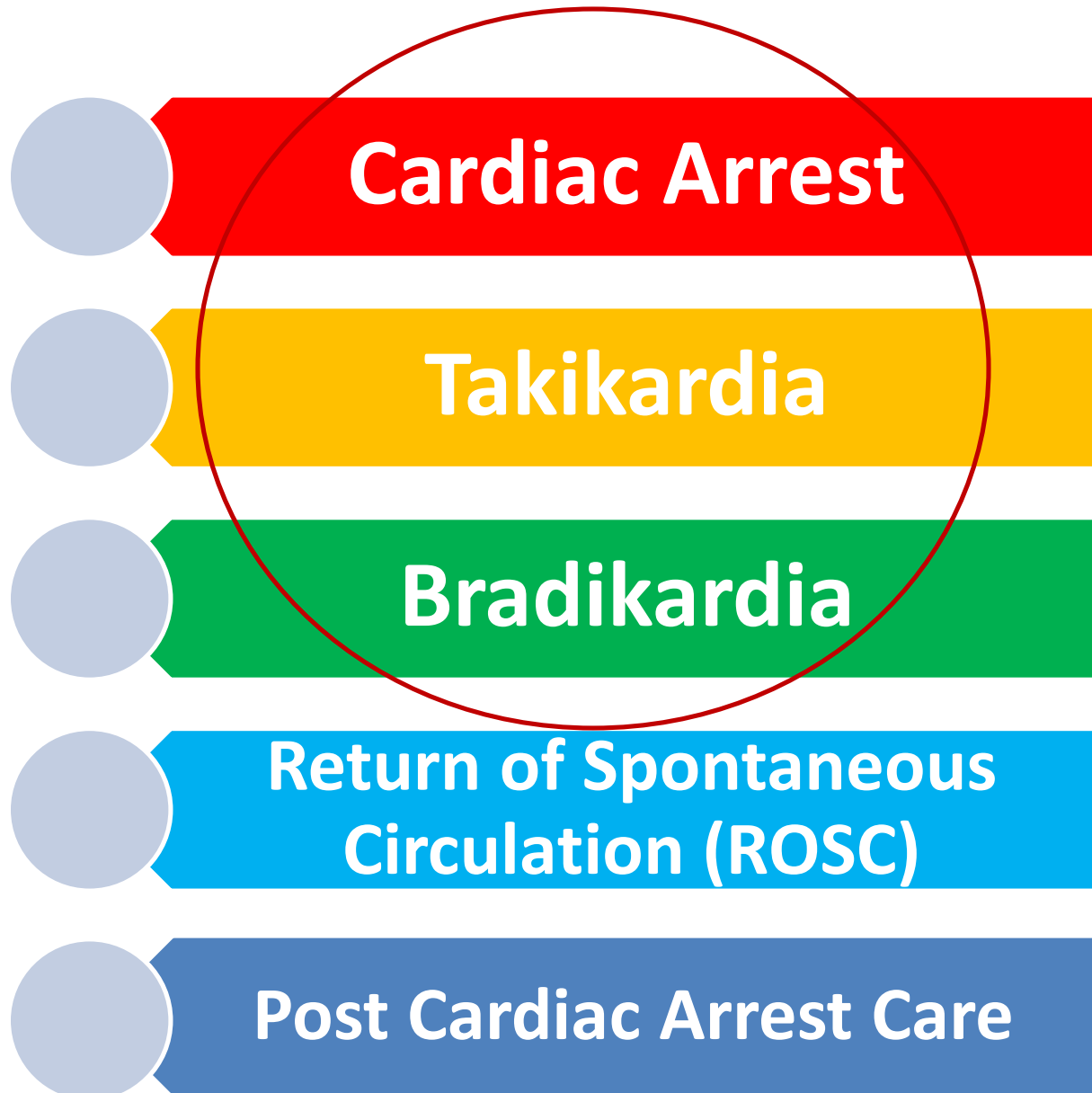
Perhitungan
denyut nadi dilakukan
selama 1 menit



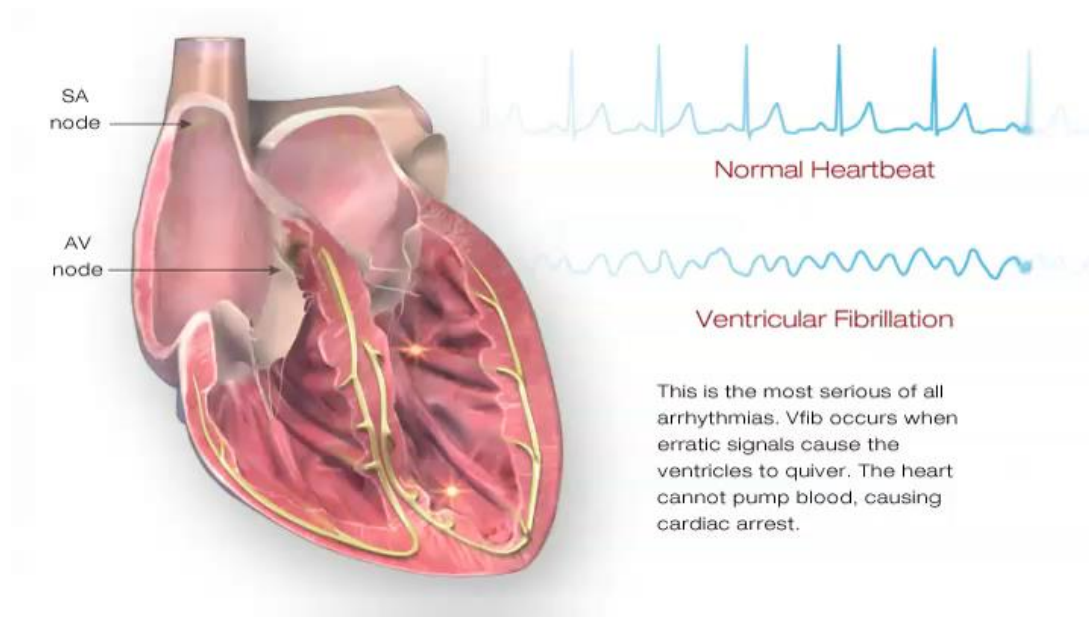
Pemeriksaan arteri karotis

Arteri Karotis

Advance Cardiac Life Support

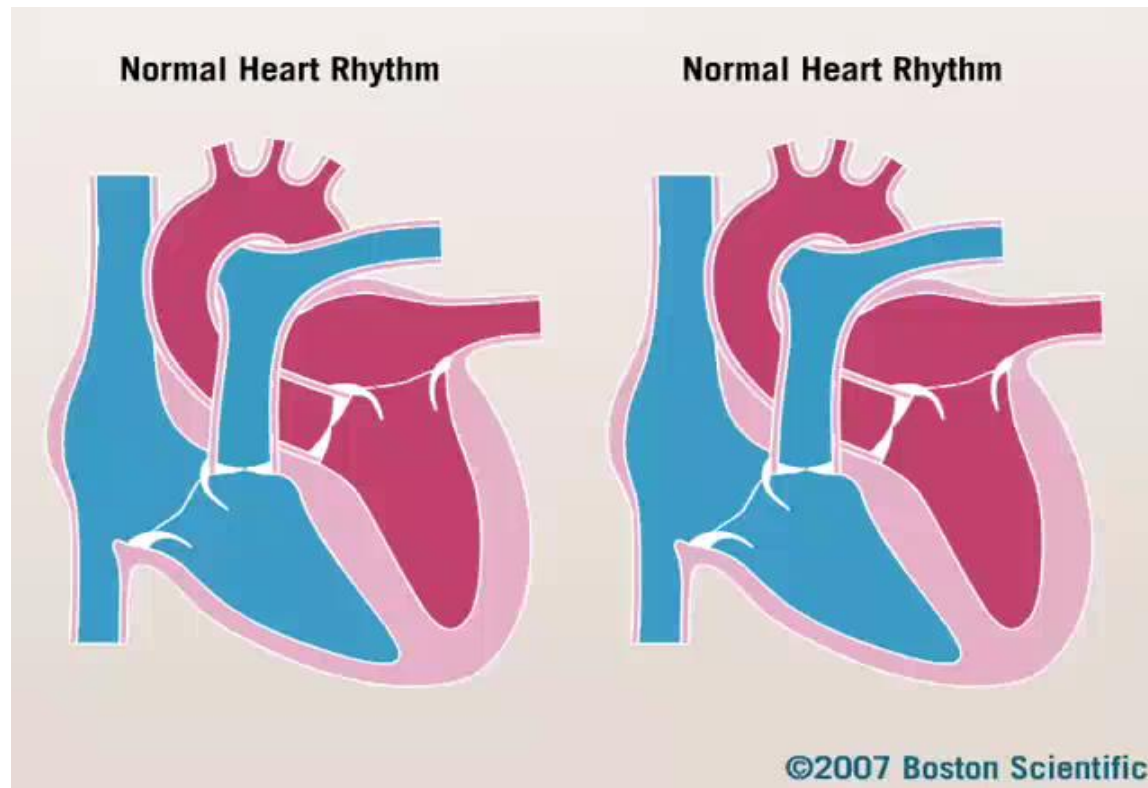


Irama Jantung Cardiac Arrest



Cardiac Arrest

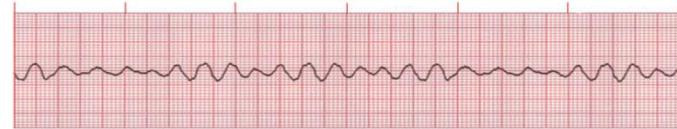
 Keadaan **terhentinya aliran darah** dalam sistem sirkulasi tubuh secara tiba-tiba akibat terganggunya efektivitas kontraksi jantung



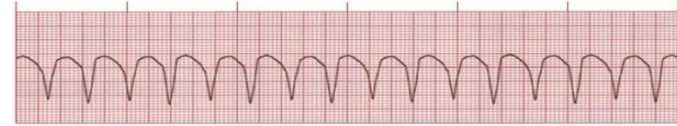
Cardiac Arrest / Henti Jantung

1. Pasien tidak sadar
2. Tidak ada nafas dan tidak teraba nadi
3. EKG:

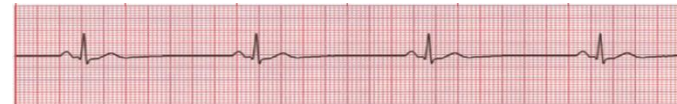
Ventricular Fibrillation (VF)



Pulseless Ventricular Tachycardia (VT)



Pulseless electrical activity (PEA)



Asistole

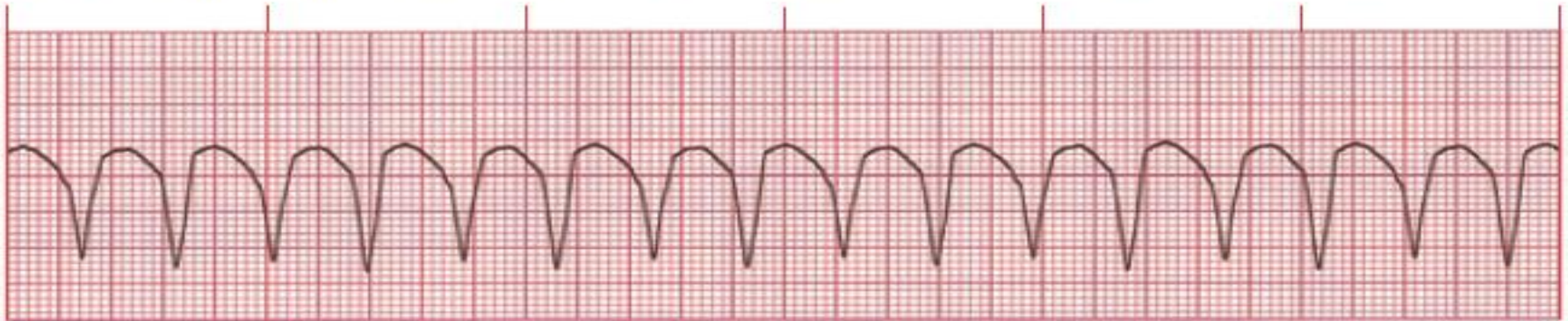


Hasil penelitian :

Gbr EKG pada saat terjadi serangan jantung , sekitar 60%-70% adalah irama Ventricular Fibrilasi (VF)

Ventricular Tachycardia (VT): Monomorphic

■ QRS complexes in monomorphic VT have the same shape and amplitude.



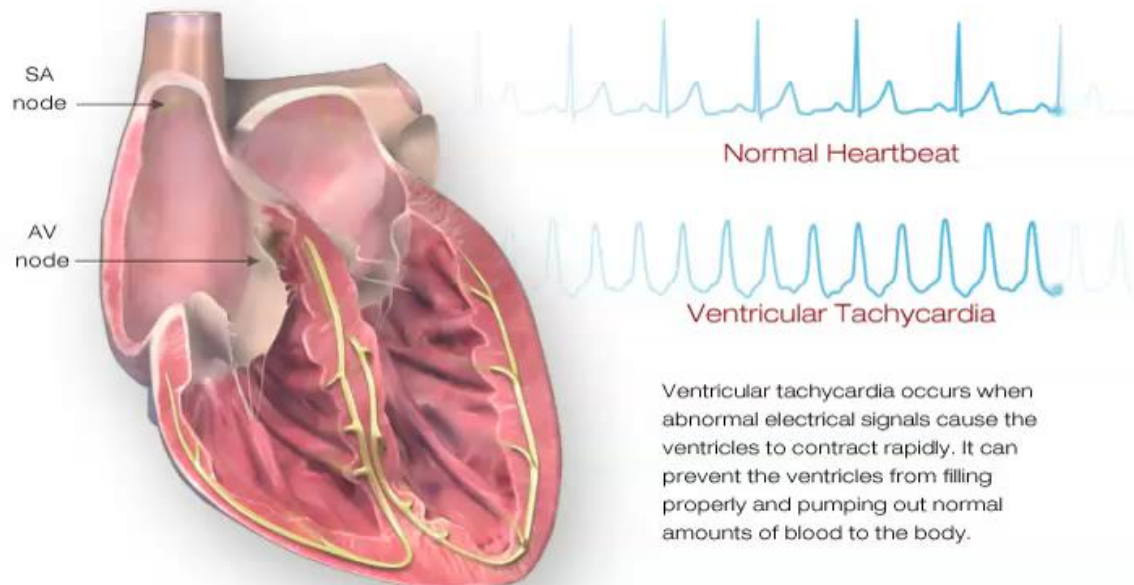
Rate: 100–250 bpm

Rhythm: Regular

P Waves: None or not associated with the QRS

PR Interval: None

QRS: Wide (>0.10 sec), bizarre appearance



Ventricular tachycardia occurs when abnormal electrical signals cause the ventricles to contract rapidly. It can prevent the ventricles from filling properly and pumping out normal amounts of blood to the body.

Ventricular Tachycardia (VT): Polymorphic

- QRS complexes in polymorphic VT vary in shape and amplitude.
- The QT interval is normal or long.



Rate: 100–250 bpm

Rhythm: Regular or irregular

P Waves: None or not associated with the QRS

PR Interval: None

QRS: Wide (>0.10 sec), bizarre appearance

Torsade de Pointes

- The QRS reverses polarity and the strip shows a spindle effect.
- This rhythm is an unusual variant of polymorphic VT with normal or long QT intervals.
- In French the term means “twisting of the points.”



Rate: 200–250 bpm

Rhythm: Irregular

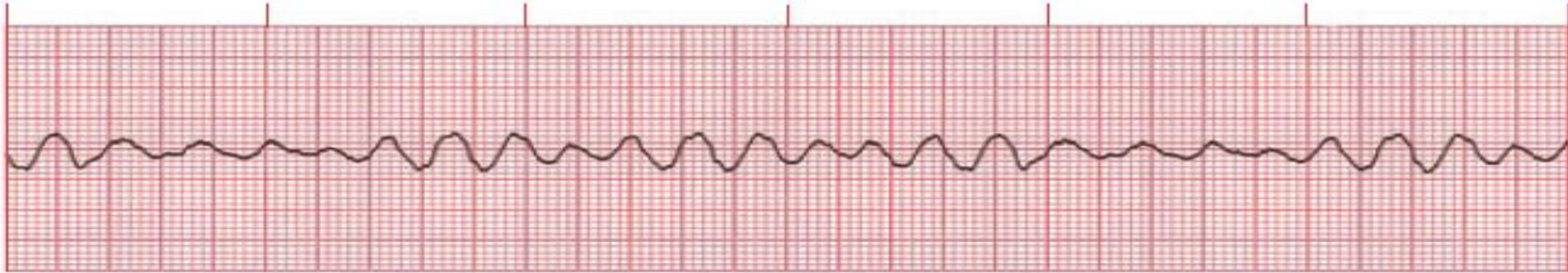
P Waves: None

PR Interval: None

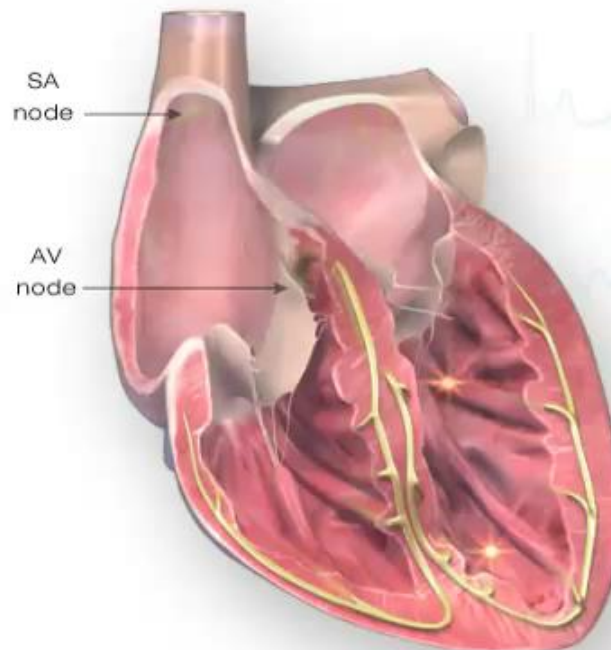
QRS: Wide (>0.10 sec), bizarre appearance

Ventricular Fibrillation (VF)

- Chaotic electrical activity occurs with no ventricular depolarization or contraction.
- The amplitude and frequency of the fibrillatory activity can be used to define the type of fibrillation as coarse, medium, or fine.



Rate: Indeterminate
Rhythm: Chaotic
P Waves: None
PR Interval: None
QRS: None



Normal Heartbeat



Ventricular Fibrillation

This is the most serious of all arrhythmias. Vfib occurs when erratic signals cause the ventricles to quiver. The heart cannot pump blood, causing cardiac arrest.

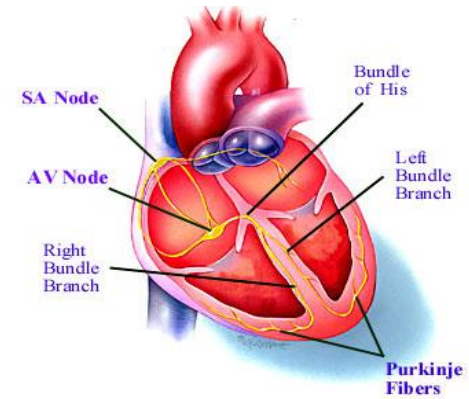
Pulseless Electrical Activity (PEA)

- Monitor shows an identifiable electrical rhythm, but no pulse is detected.
- Rhythm may be sinus, atrial, junctional, or ventricular in origin.
- PEA is also called electromechanical dissociation (EMD).



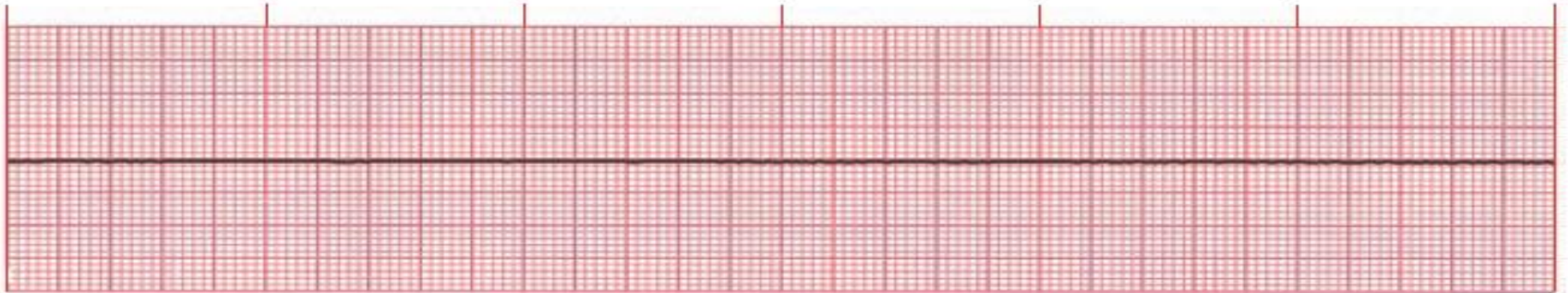
Rate, rhythm, P waves, P-R interval, and QRS: Reflect underlying rhythm.

SINUS RHYTHM



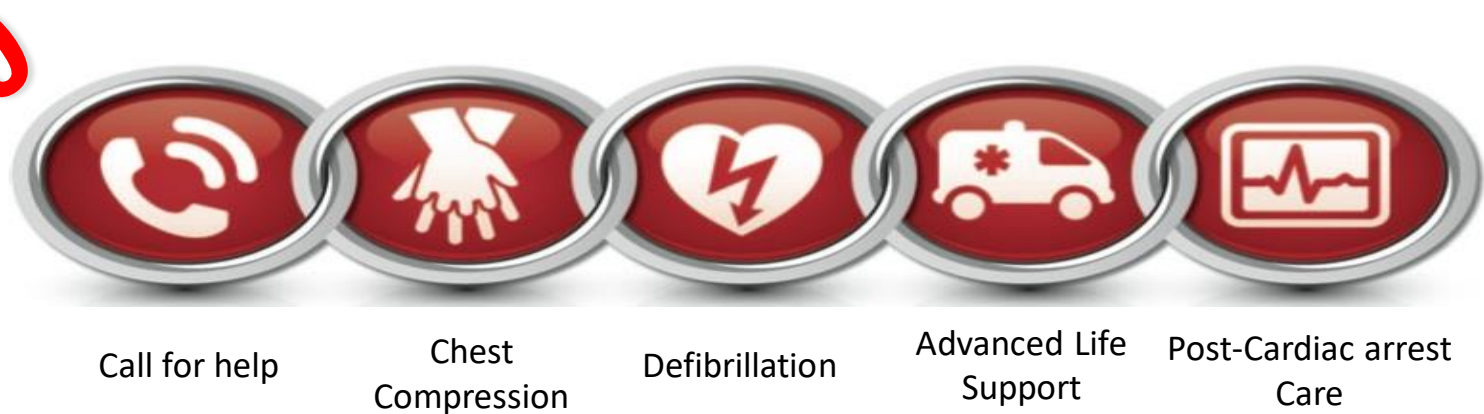
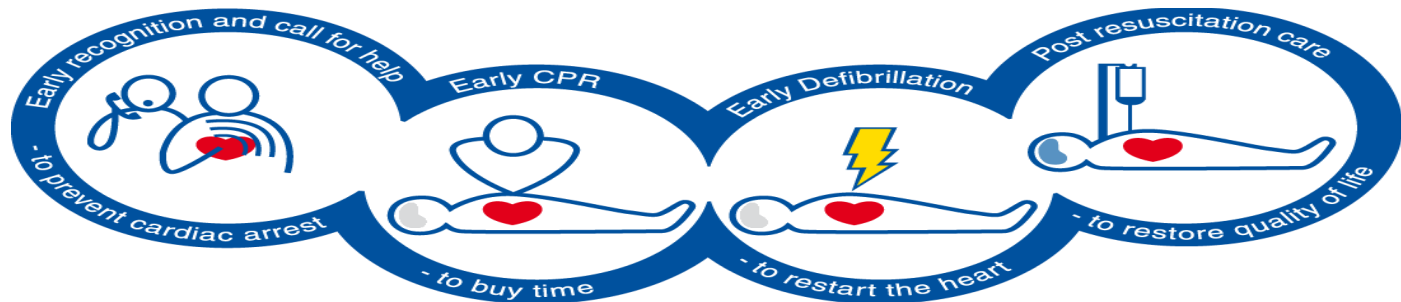
Asystole

■ Electrical activity in the ventricles is completely absent.



Rate: None
Rhythm: None
P Waves: None
PR Interval: None
QRS: None

CHAINS OF SURVIVAL



IHCA and OHCA Chains of Survival

IHCA

Dalam
Rumah Sakit

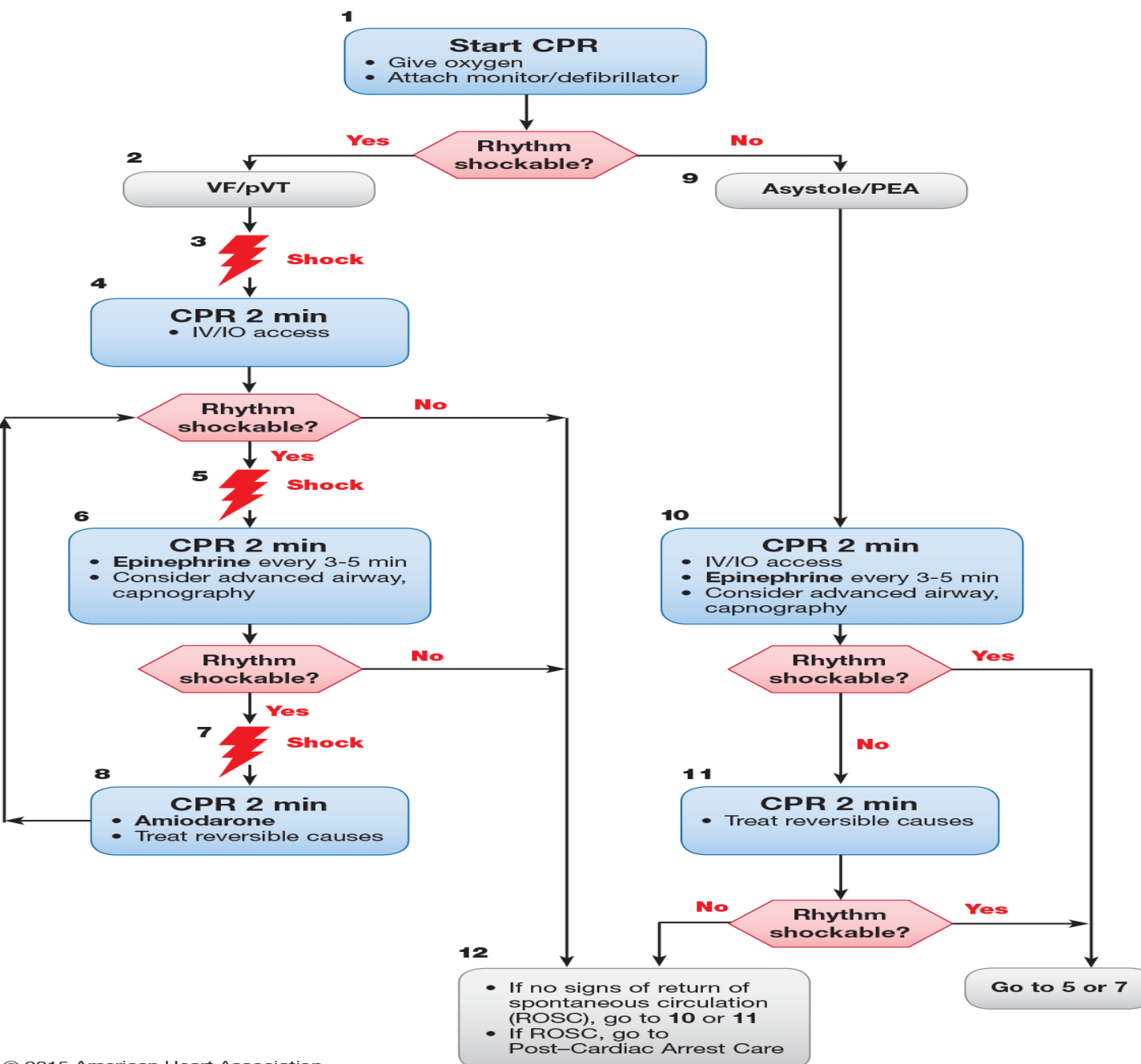


OHCA

Luar
Rumah Sakit



Adult Cardiac Arrest Algorithm—2015 Update



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
 - If PETCO₂ <10 mm Hg, attempt to improve CPR quality.
- Intra-arterial pressure
 - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

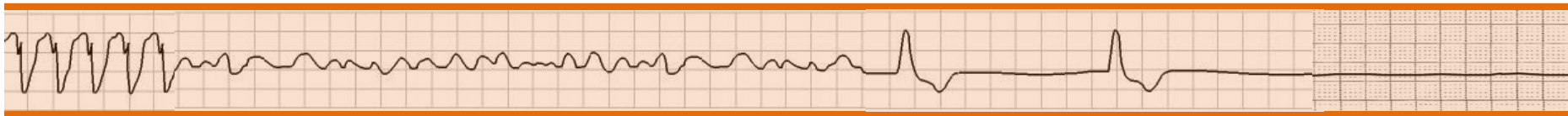
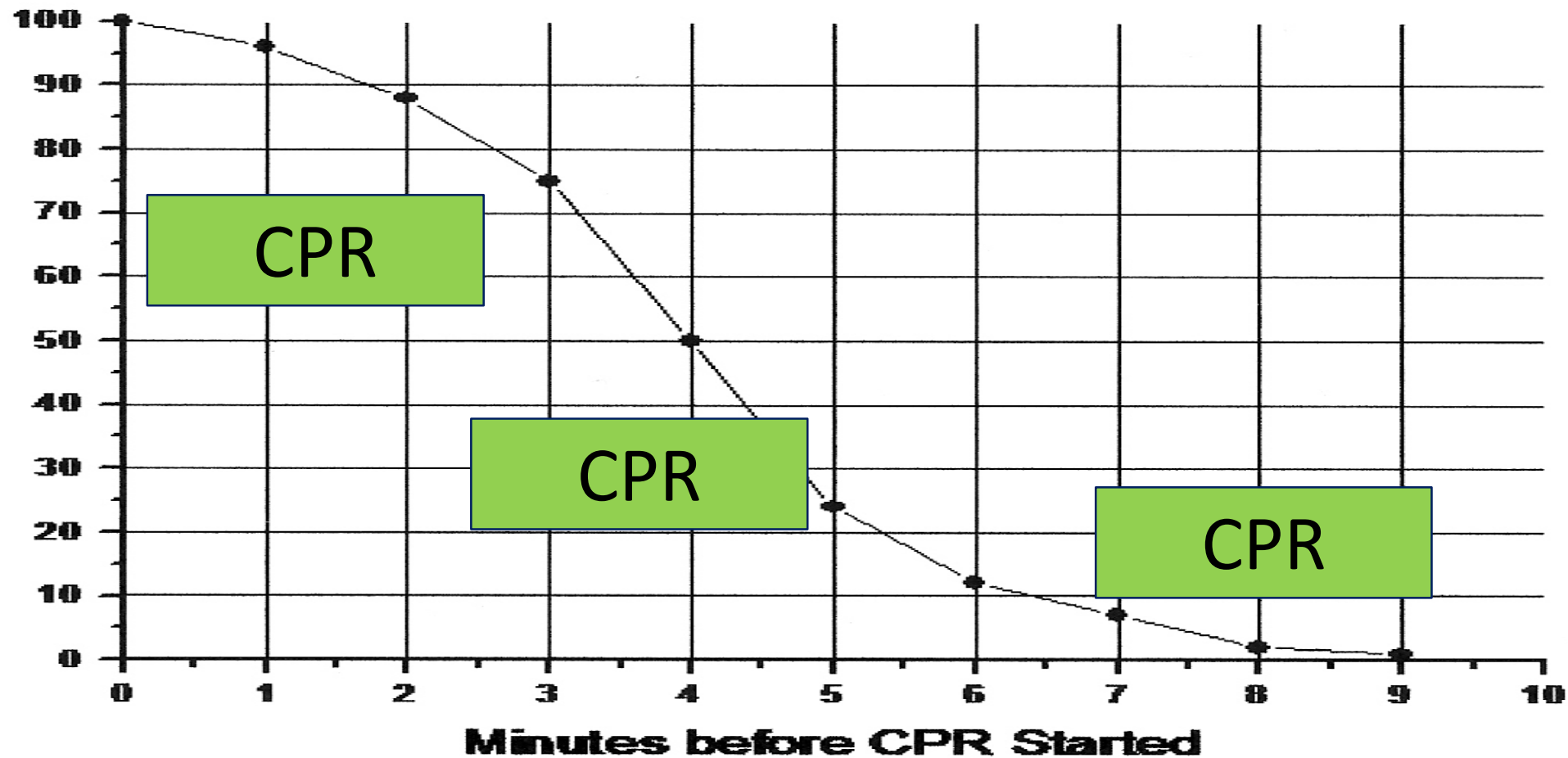
Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary



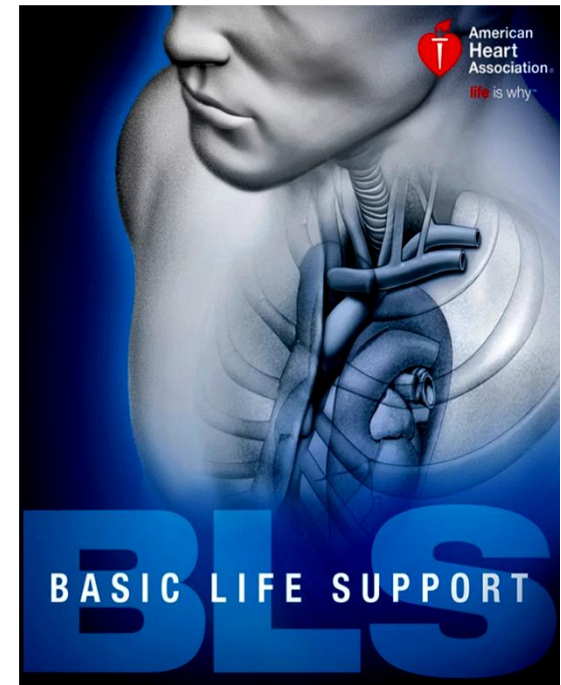
High Quality *CPR*

Survival with CPR





- Danger : Bahaya.
- Respon : Respon.
- Call For Help : Panggil bantuan.
- Circulation : Sirkulasi.
- Airway : Jalan napas.
- Breathing : Pernapasan.



ANJURAN & LARANGAN BLS UNTUK CPR BERKUALITAS TINGGI

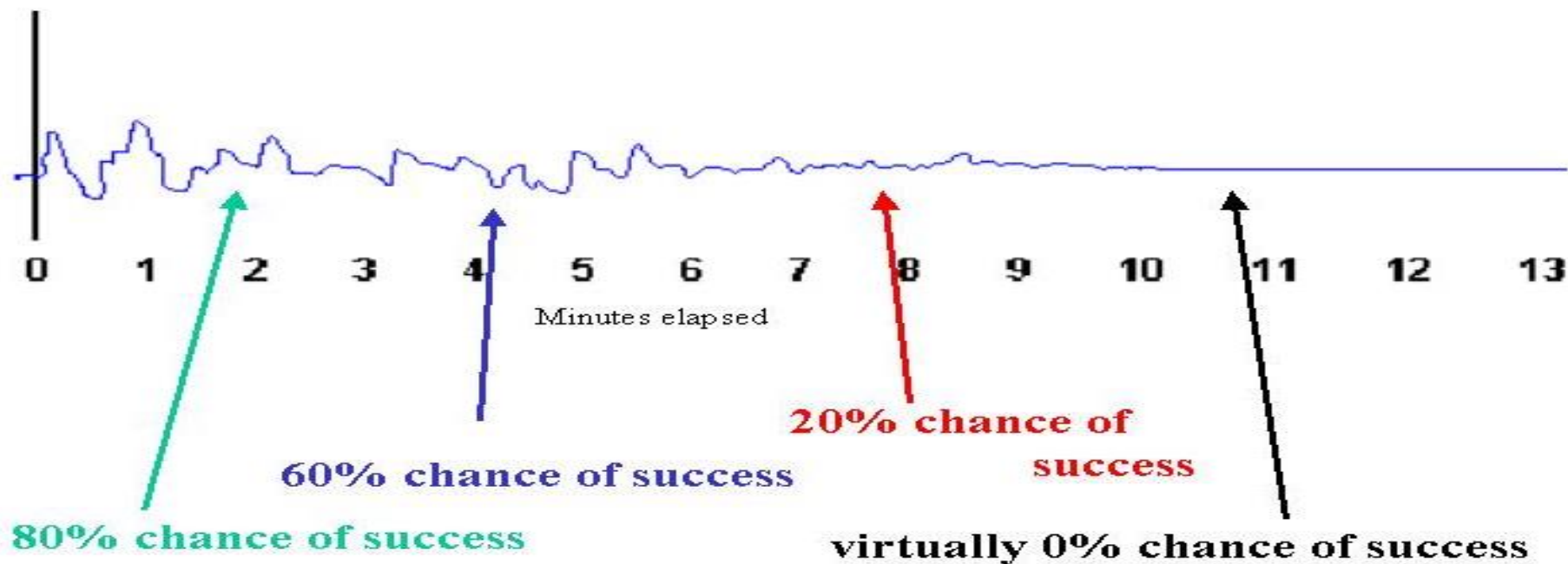
Penolong HARUS	Penolong TIDAK boleh
Melakukan kompresi dada dengan kecepatan 100 – 120 kali/ menit	Mengkompresi dengan kecepatan lebih rendah dari 100 x/ menit atau lebih cepat dari 120 x/ menit
Kompresi kedalaman minimal 2 inchi (5 cm)	Kompresi kedalaman kurang dari 2 inchi atau lebih dari 2,4 inchi (6 cm)
Membolehkan rekoil penuh setelah setiap kali kompresi	Bertumpu di atas dada di antara kompresi yang dilakukan
Meminimalkan jeda dalam kompresi	Menghentikan kompresi lebih dari 10 detik
Memberikan ventilasi yang cukup (2 nafas buatan setelah 30 kompresi, setiap nafas buatan diberikan lebih dari 1 detik, setiap kali diberikan dada akan terangkat	Memberikan ventilasi berlebihan (mis: terlalu banyak nafas buatan atau memberikan nafas buatan dengan kekuatan berlebihan)

Early Defibrillation



Defibrillation Statistics:

Defibrillation's chances of restoring a pulse decrease rapidly with time



DEFIBRILASI

DEFINISI

Defibrilasi adalah tindakan terapi dengan cara memberikan arus listrik yang kuat dengan cara asinkron

Indikasi :

- Ventrikular fibrilasi (VF)
- Ventrikular takikardi tanpa nadi (VT non pulse)

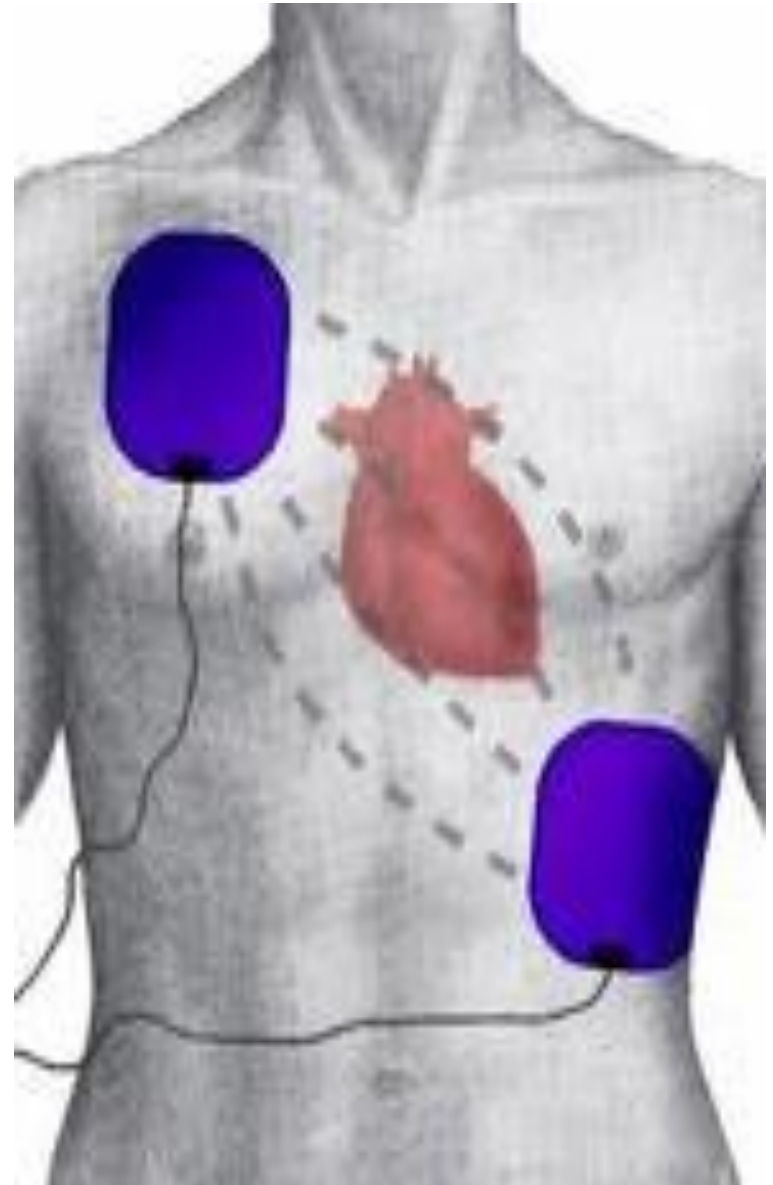
AHA 2015:
Setelah teridentifikasi pasien
VF/pVT, dalam waktu < 4 mnt
DC Shock dilakukan

DEFIBRILASI

Defibrilasi harus dilakukan dengan segera dengan alasan:

1. Irama yang terjadi pada henti jantung umumnya adalah VF
2. VF cenderung berubah menjadi asistol dalam waktu beberapa menit
3. Pengobatan yang efektif untuk VF adalah defibrilasi
4. Makin lambat defibrilasi dilakukan, makin kurang kemungkinan keberhasilannya

DEFIBRILATION POSITION



SHOCK THERAPY

(Recommendation AHA 2015)



Patient	Defibrilasi (Asynchronise)
Adult	• Bi phasic = 200 J • Monophasic = 360 J
Pediatrik	• 1st = 2 J/kg • 2nd = 4 J / kg • Maks = 10 J/kg

Defibrillation Waveforms :

① Monophasic Waveform Defibrillators

② Biphasic Waveform Defibrillators

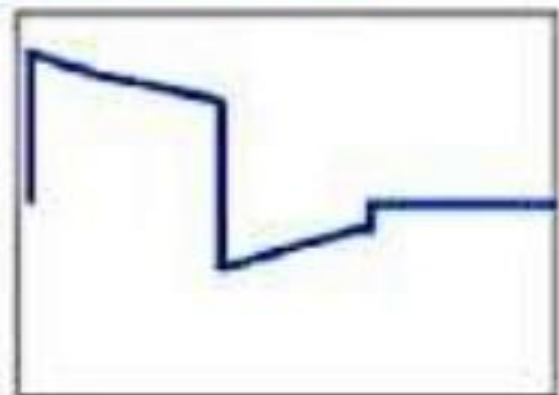
Monophasic



Current delivered
in **one** direction



Biphasic

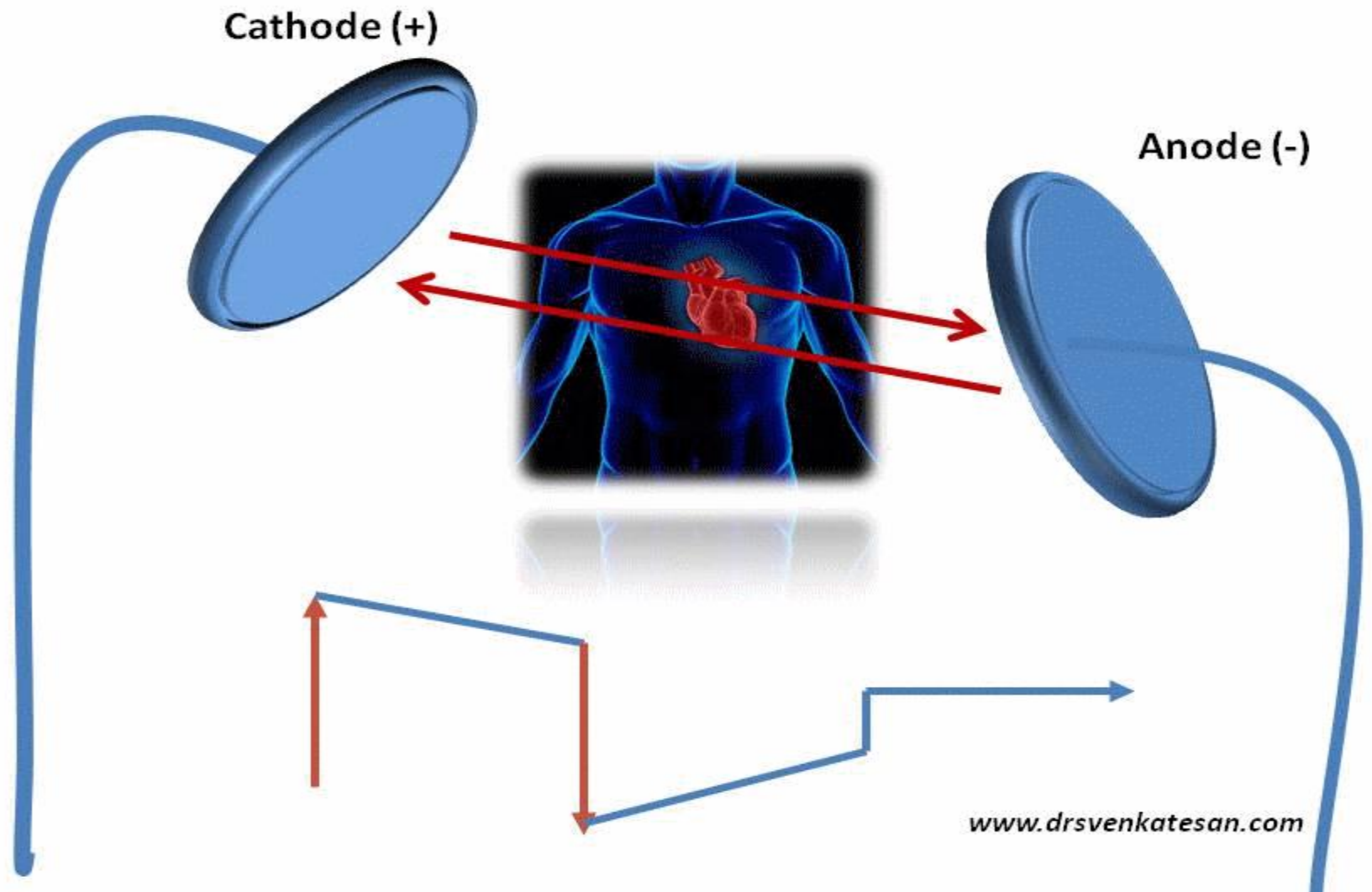


Current delivered
in **two** directions



from one electrode to the other

Bi-Phasic DC shock



Biphasic vs Monophasic Defibrillation

□ Advantages

- greater efficacy
- low energy produces same effect
- less myocardial damage
- less incidence of S-T changes

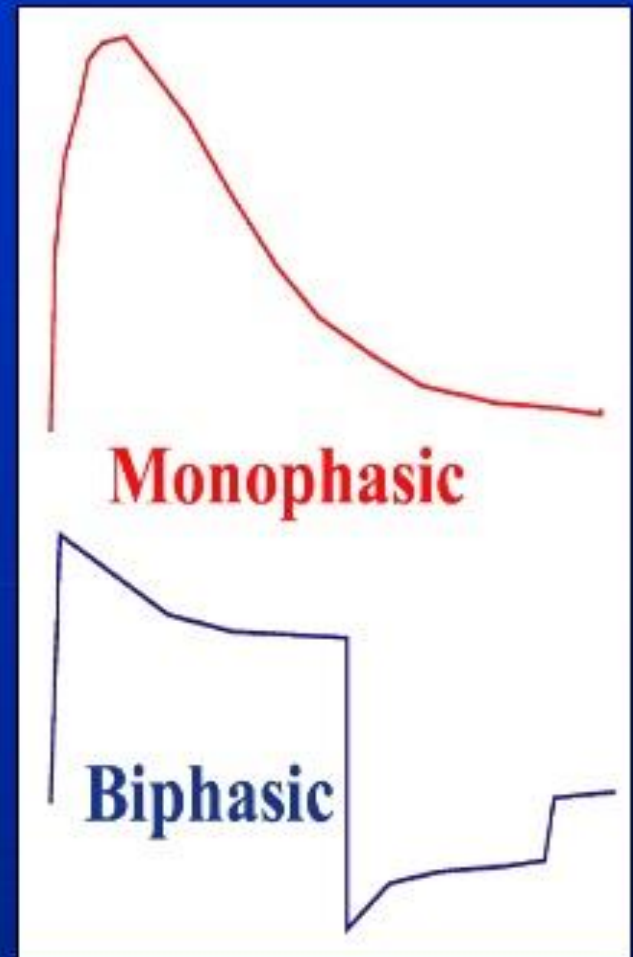
(*Ital Heart J Suppl.* 2002 Jun;3(6):638-45)

□ Energy

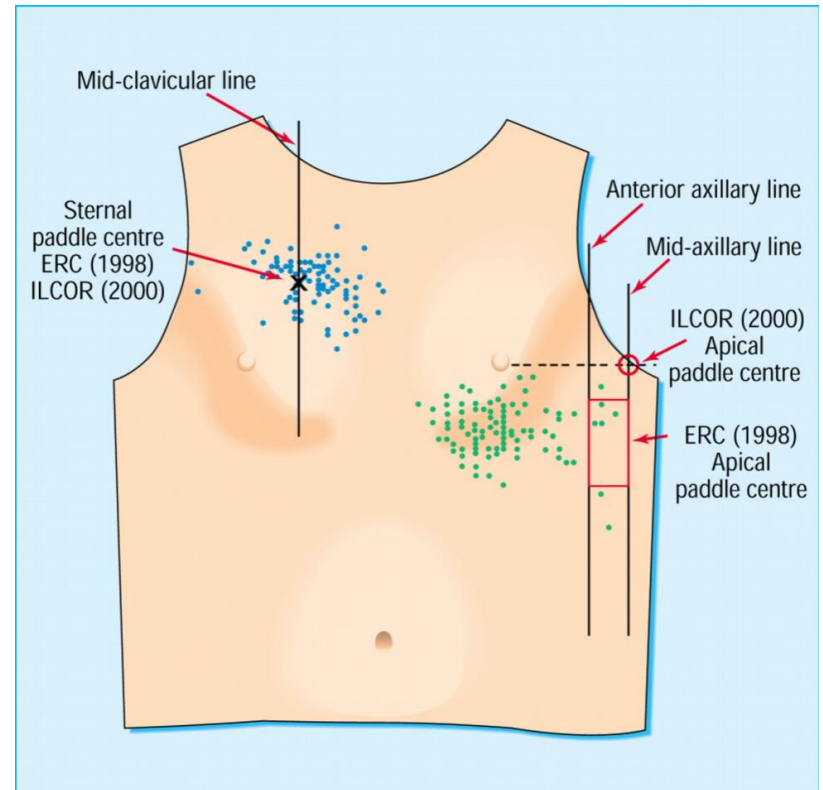
- Monophasic 360 J
- Biphasic 150/200 J

□ All AEDs are Biphasic

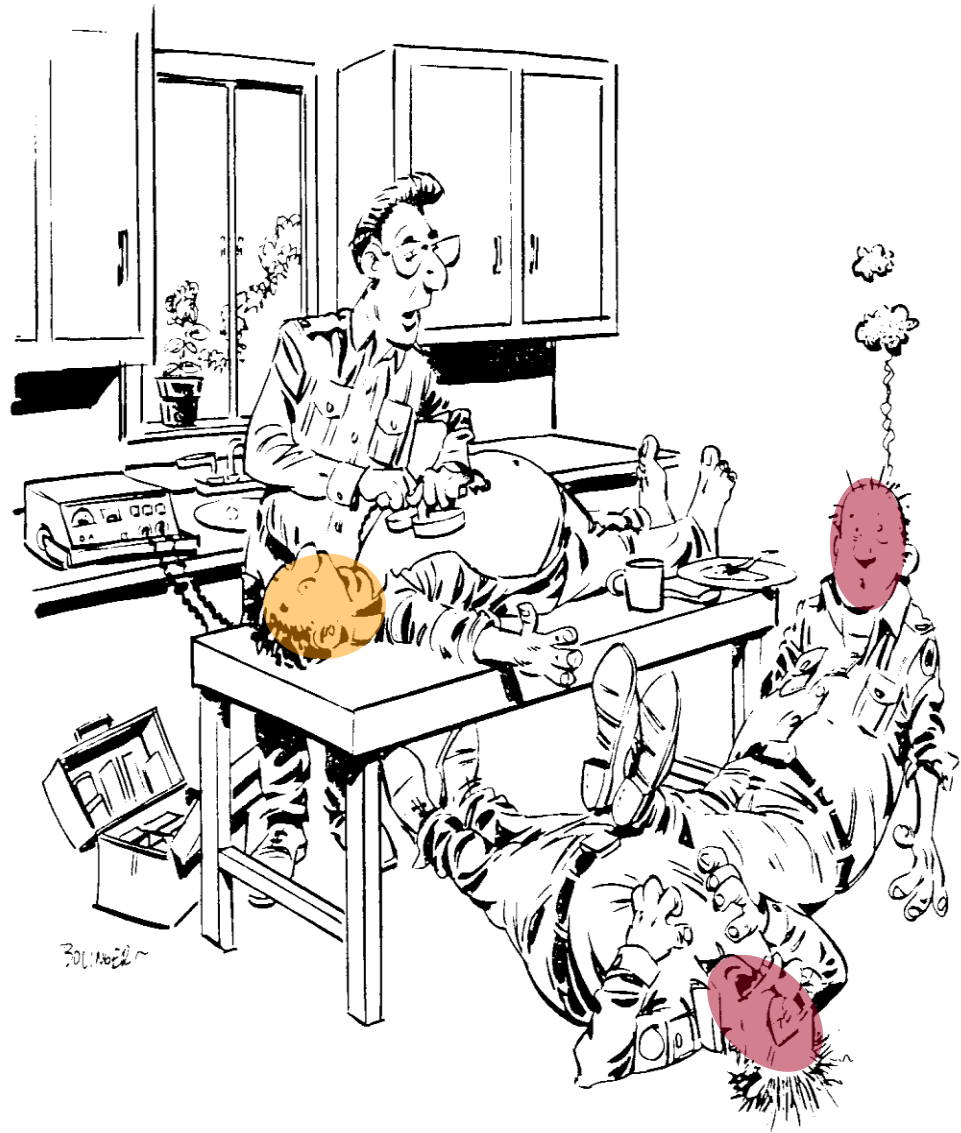
□ High first shock success of Biphasic defibrillation (84%-95%)



- Siapkan defibrilator
- Siapkan paddle
- Isi energi: CHARGE
- Stop CPR
- Tempel paddle
- I'm clear, you're clear, everybody's clear
- Lakukan shock: DISCHARGE
- Angkat paddle
- Lanjutkan CPR
- Evaluasi monitor



- Siapkan defibrilator
- Siapkan paddle
- Tempel paddle
- Isi energi: CHARGE
- Stop CPR
- I'm clear, you're clear, everybody's clear
- Lakukan shock: DISCHARGE
- Angkat paddle
- Lanjutkan CPR
- Evaluasi monitor



"Did I forget to say CLEAR?"

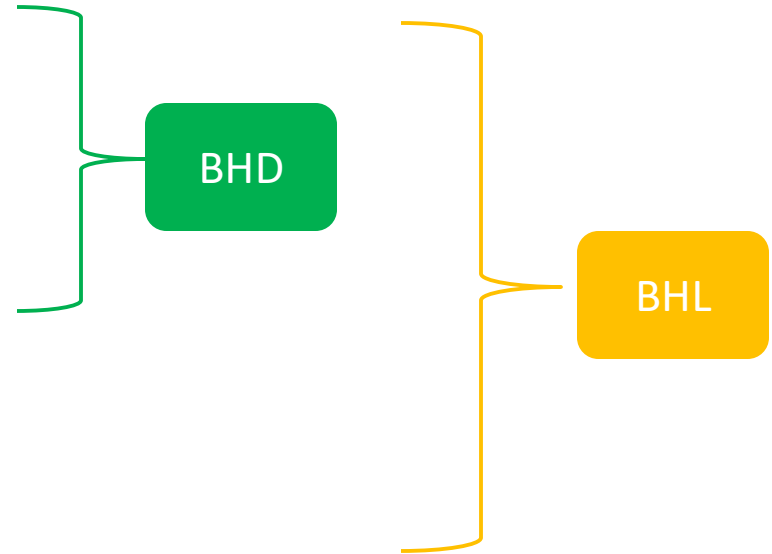
DRUGS THERAPY

(Recommendation AHA 2015)

Patient	Adult	Pediatric
Efineprine	1 mg tiap 3-5 menit Tidak ada maksimal dose	- 1 mg=1amp diencerkan dengan WFI menjadi 10 cc Diberikan 1 cc (0.1mg) - Repeat 3-5minutes.
Sulfas Atropin (SA)	First dose : 0.5 mg Maksimal dose : 3 mg 1 amp utk sekali pemberian Repeat 3-5minutes.	- 0.02 mg/kg.minimum dose 0.1 mg, maks dose 0.5 mg - 1 amp dioplos dalam spuit 2.5cc - Repeat 3-5minutes.

Bantuan Hidup Lanjut Di RS

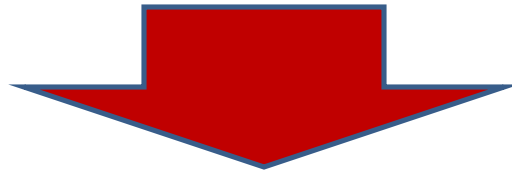
1. CPR
2. Airway Management
3. Breathing Management
4. Defibrillation
5. Drugs Management



ROSC Management

Tatalaksana Henti Jantung Di RS (Code Blue)

Penatalaksanaan Code Blue tidak dapat dilakukan
seorang diri



Call For Help



Penatalaksanaan Code Blue tidak dapat dilakukan seorang diri



Sistem Komunikasi & Koordinasi

- Komunikasi di dalam ruangan
- Komunikasi Gedung (Sentral)

Operator :
“Code Blue di lantai
kamar” (2x)



**Saat kode diaktifkan tim menuju ruangan di mana pasien berada
& melakukan tindakan resusitasi jantung paru**



Uncoordinated Cardiac Arrest Team



Code Blue Team Positions (AHA 2015)

Positions for 6-Person High-Performance Teams*



Resuscitation Triangle Roles

**Compressor**

- Assesses the patient
- Does 5 cycles of chest compressions
- Alternates with AED/Monitor/Defibrillator every 5 cycles or 2 minutes (or earlier if signs of fatigue set in)

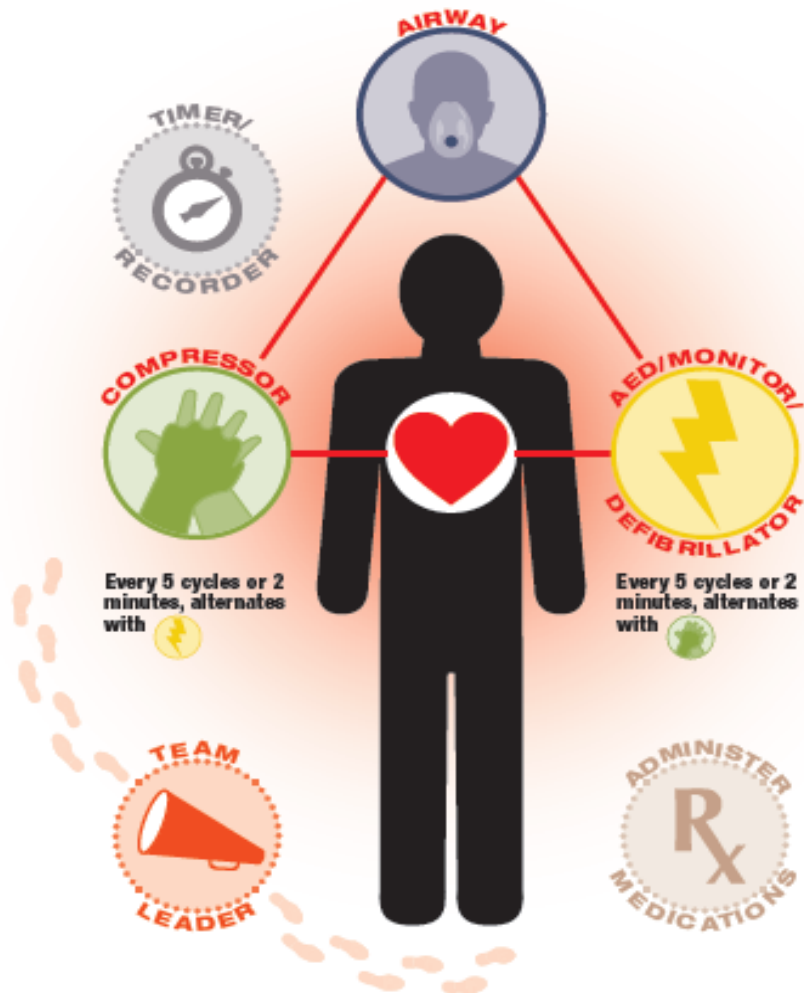
**AED/Monitor/Defibrillator**

- Brings and operates the AED/monitor/defibrillator
- Alternates with Compressor every 5 cycles or 2 minutes (or earlier if signs of fatigue set in), ideally during rhythm analysis
- If a monitor is present, places it in a position where it can be seen by the Team Leader (and most of the team)

**Airway**

- Opens and maintains the airway
- Provides ventilation

The team owns the code. No team member leaves the triangle except to protect his or her safety.



Leadership Roles

**Team Leader**

- Every resuscitation team must have a defined leader**
- Assigns roles to team members
- Makes treatment decisions
- Provides feedback to the rest of the team as needed
- Assumes responsibility for roles not assigned

**Administer Medications**

- An ALS provider role
- Administers medications

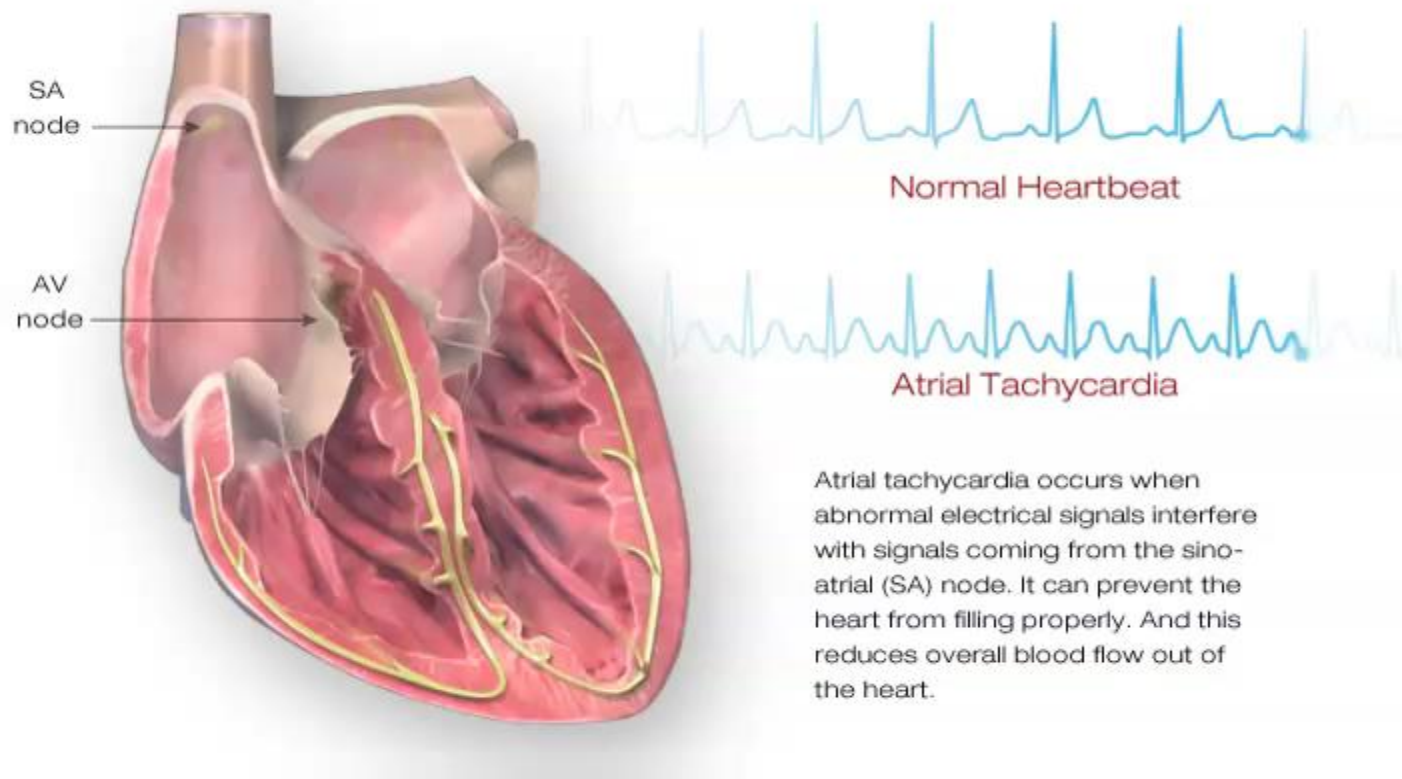
**Timer/Recorder**

- Records the time of interventions and medications (and announces when these are next due)
- Records the frequency and duration of interruptions in compressions
- Communicates these to the Team Leader (and the rest of the team)

*This is a suggested team formation. Roles may be adapted to local protocol.

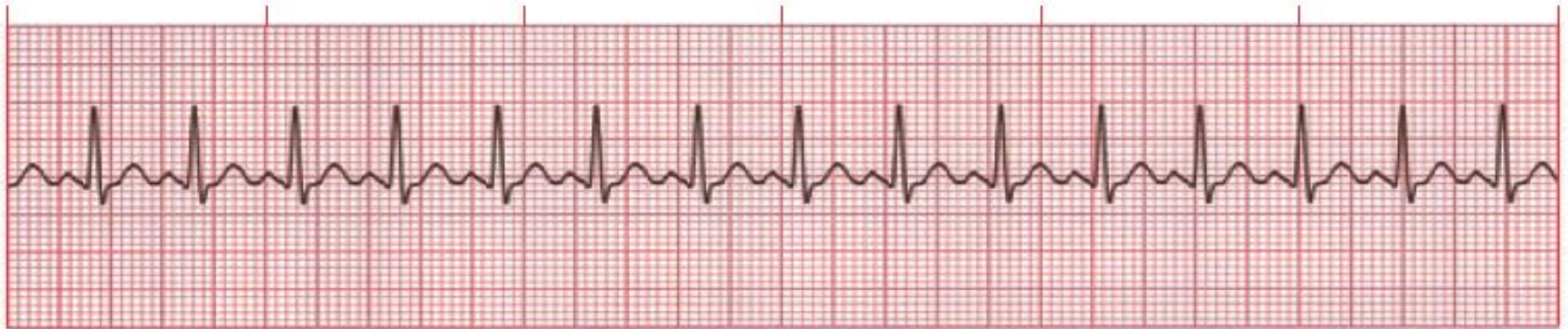
ARITMIA DENGAN FREKUENSI CEPAT

Dengan Nadi



Sinus Tachycardia

■ Results from increased SA node discharge.



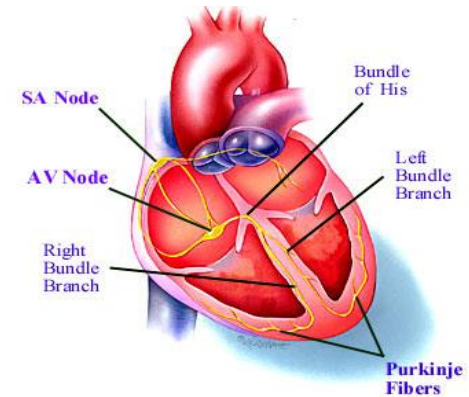
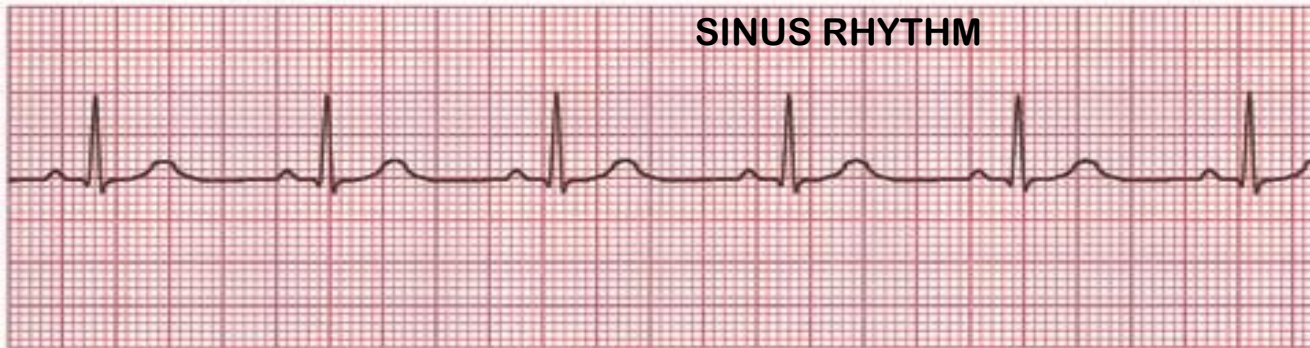
Rate: Fast (>100 bpm)

Rhythm: Regular

P Waves: Normal (upright and uniform)

PR Interval: Normal (0.12–0.20 sec)

QRS: Normal (0.06–0.10 sec)



Ventricular Tachycardia (VT): Monomorphic

■ QRS complexes in monomorphic VT have the same shape and amplitude.



**VT DENGAN
NADI**

Rate: 100–250 bpm

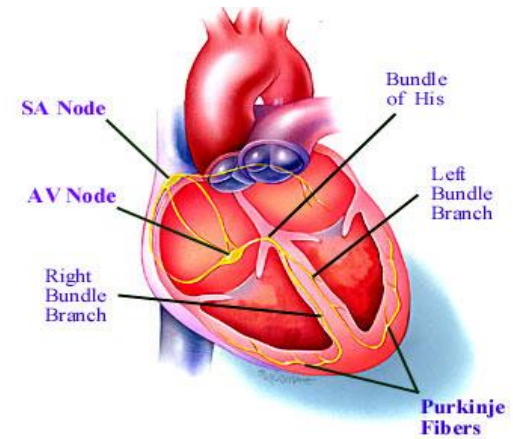
Rhythm: Regular

P Waves: None or not associated with the QRS

PR Interval: None

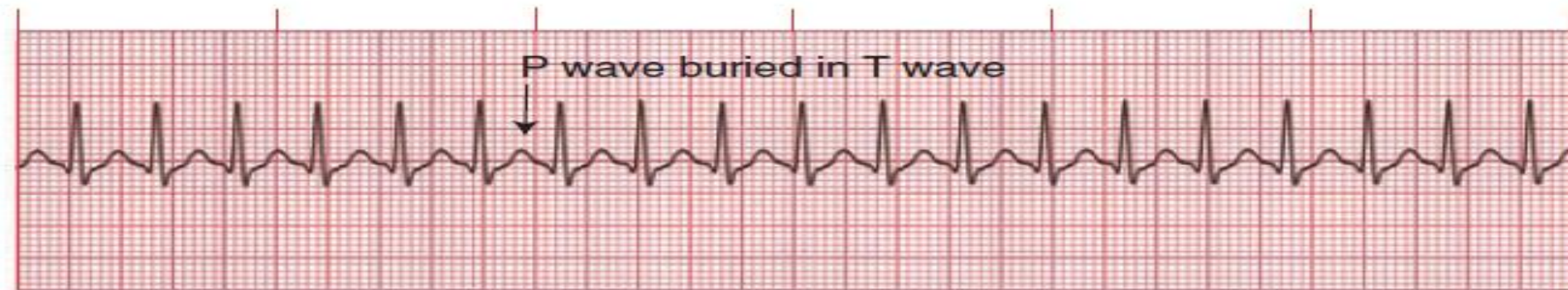
QRS: Wide (>0.10 sec), bizarre appearance

SINUS RHYTHM



Supraventricular Tachycardia (SVT)

■ This arrhythmia has such a fast rate that the P waves may not be seen.



Rate: 150–250 bpm

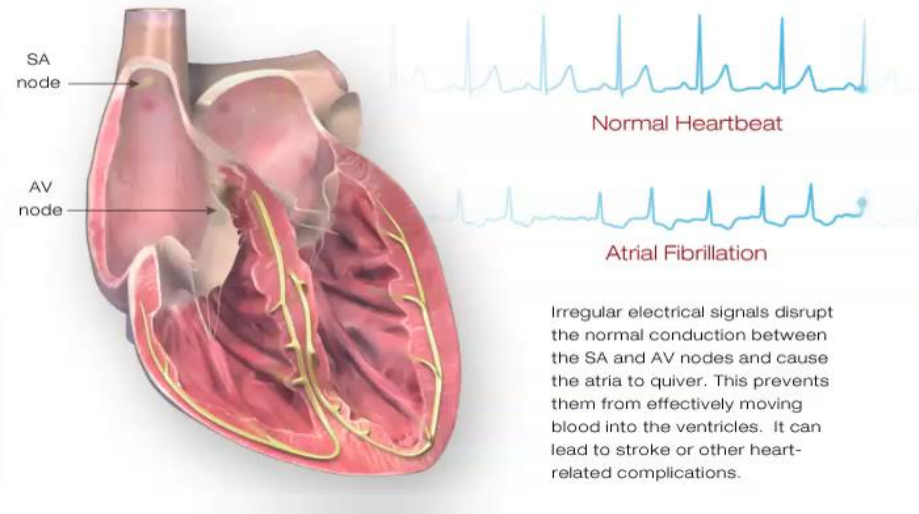
Rhythm: Regular

P Waves: Frequently buried in preceding T waves and difficult to see

PR Interval: Usually not possible to measure

QRS: Normal (0.06–0.10 sec) but may be wide if abnormally conducted through ventricles

SINUS RHYTHM



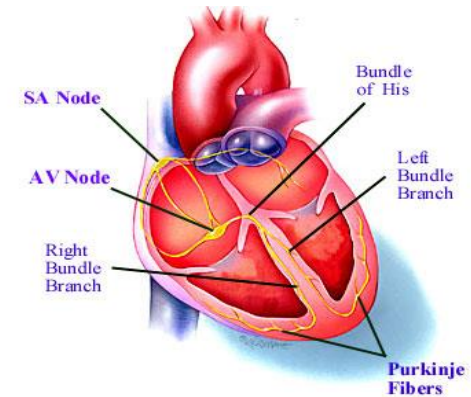
Atrial Fibrillation (A-fib)

- Rapid, erratic electrical discharge comes from multiple atrial ectopic foci.
- No organized atrial contractions are detectable.



Rate: Atrial: 350 bpm or greater; ventricular: slow or fast
Rhythm: Irregular
P Waves: No true P waves; chaotic atrial activity
PR Interval: None
QRS: Normal (0.06–0.10 sec)

SINUS RHYTHM



Atrial Flutter (A-flutter)

- AV node conducts impulses to the ventricles at a 2:1, 3:1, 4:1, or greater ratio (rarely 1:1).
- Degree of AV block may be consistent or variable.



Rate: Atrial: 250–350 bpm; ventricular: slow or fast

Rhythm: Usually regular but may be variable

P Waves: Flutter waves have a saw-toothed appearance

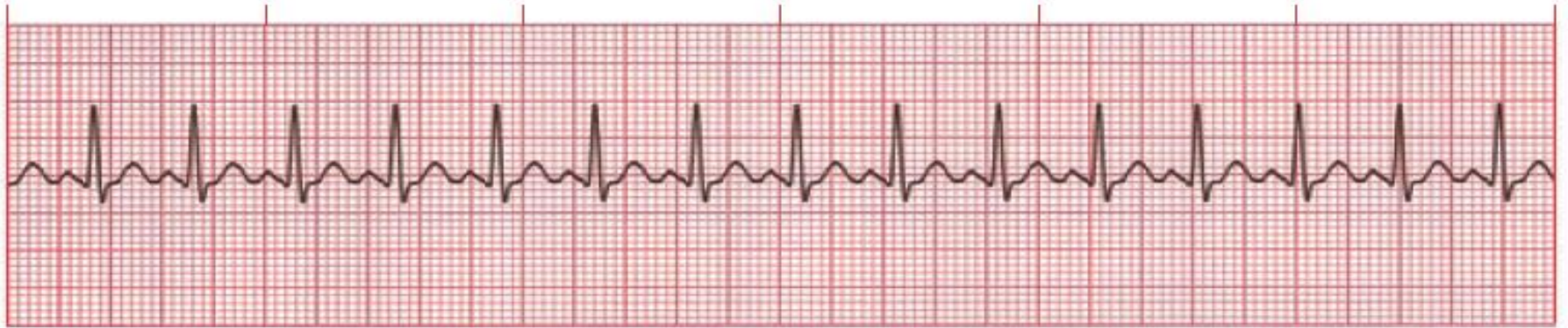
PR Interval: Variable

QRS: Usually normal (0.06–0.10 sec), but may appear widened if flutter waves are buried in QRS

Tatalaksana...

Sinus Tachycardia

■ Results from increased SA node discharge.



Rate: Fast (>100 bpm)

Rhythm: Regular

P Waves: Normal (upright and uniform)

PR Interval: Normal (0.12–0.20 sec)

QRS: Normal (0.06–0.10 sec)

Atasi Penyebab :

- Volume Cairan ?
- Febris ?
- Pain ?
- Restless?
- Drugs efek ?
- Electrical impulse problem?

Clinical Parameters Of Circulatory Shock

Table 1. Clinical parameters for estimating severity of circulatory shock

Stage	Pa	HR	CR (2 min)	Urine ml/h	Mental Status	% Loss
1	normal	normal	<2	>30	normal or anxious	<15
2	↓Tilt +	>100	>2	20	anxious	>20
3	↓	>120	>2	5-15	confused	>30
4	↓	>140	>2	0-5	lethargic	>40

Pa: arterial pressure; CR: capillary refill; HR: heart rate

Adult Tachycardia With a Pulse Algorithm

1

Assess appropriateness for clinical condition.
Heart rate typically $\geq 150/\text{min}$ if tachyarrhythmia.

2

Identify and treat underlying cause

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry

3

Persistent tachyarrhythmia causing:

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Yes

4

Synchronized cardioversion

- Consider sedation
- If regular narrow complex, consider adenosine

No

5

Wide QRS? ≥ 0.12 second

Yes

6

- IV access and 12-lead ECG if available
- Consider adenosine only if regular and monomorphic
- Consider antiarrhythmic infusion
- Consider expert consultation

No

7

- IV access and 12-lead ECG if available
- Vagal maneuvers
- Adenosine (if regular)
- β -Blocker or calcium channel blocker
- Consider expert consultation

Doses/Details

Synchronized cardioversion:

Initial recommended doses:

- Narrow regular: 50-100 J
- Narrow irregular: 120-200 J biphasic or 200 J monophasic
- Wide regular: 100 J
- Wide irregular: defibrillation dose (*not* synchronized)

Adenosine IV dose:

First dose: 6 mg rapid IV push; follow with NS flush.
Second dose: 12 mg if required.

Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

Procainamide IV dose:

20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases $>50\%$, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

Amiodarone IV dose:

First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

Sotalol IV dose:

100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

Unstable Takikardia

- Symptomatic → Takikardi > 150x/mnt
- Takikardi yang disertai : hipotensi, penurunan kesadaran, tanda tanda syok , ada nyeri dada dan gagal jantung akut
- Jenis Takikardia :
 - Ventrikular takikardi (VT) dengan nadi
 - Supraventrikular takikardia (SVT)
 - Atrial Fibrilasi rapid respon
 - Atrial flutter

Tatalaksana : Kardioversi

KARDIOVERSI

Kardioversi adalah tindakan terapi dengan cara memberikan arus listrik dengan metode sinkron untuk mengatasi supra ventrikular takikardi (SVT), atrial fibrilasi, atrial flutter, ventrikuler takikardi (VT) dengan nadi.



Indikasi Kardioversi

- Ventrikular takikardi dengan nadi (VT pulse)
- Supra ventrikular takikardi (SVT)
- Atrial fibrilasi
- Atrial flutter

Hal yang harus diperhatikan :

- Sesuai indikasi
- Pasien tersedasi
- Bersifat elektif → Informed concent

CARDIOVERSION THERAPY

(Recommendation AHA 2015)



Patient	Kardioversi (Synchronise)
Adult	• Regular Narrow QRS = 50-100 J • Irregular Narrow QRS = 120-200 J or 200 J monophasic • Wide Regular QRS = 100 J
Pediatrik	• 0.5-1 J/kg (may increase to 2 J/Kg)

Persiapan Kardioversi

- Indikasi jelas
- Sedasi yang cukup
- Pemasangan Monitor
- Pemasangan elektrode EKG pd mesin DC Shock
- Obat-obatan emergency cth: SA & Epinefrine

Peran Perawat

1. Mengidentifikasi jenis aritmia takikardia
2. Mengetahui indikasi penggunaan Kardioversi
3. Mengetahui persiapan pasien yang akan dilakukan kardioversi :
 - Pemasangan monitor
 - Informed Consent
 - Obat-obatan (sedasi,emergency)
 - Setting Kardioversi (mode synchronise)
4. Pendokumentasian

Stable Takikardia

Doses/Details

Synchronized cardioversion:

Initial recommended doses:

- Narrow regular: 50-100 J
- Narrow irregular: 120-200 J biphasic or 200 J monophasic
- Wide regular: 100 J
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Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

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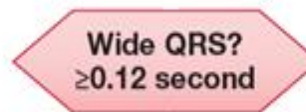
20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

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First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

Sotalol IV dose:

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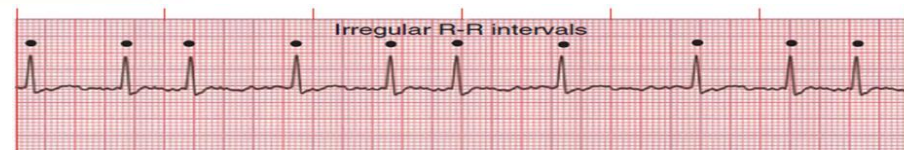
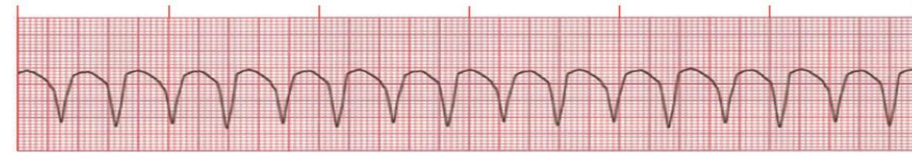


Yes

No

- IV access and 12-lead ECG if available
- Consider adenosine only if regular and monomorphic
- Consider antiarrhythmic infusion
- Consider expert consultation

- IV access and 12-lead ECG if available
- Vagal maneuvers
- Adenosine (if regular)
- β -Blocker or calcium channel blocker
- Consider expert consultation



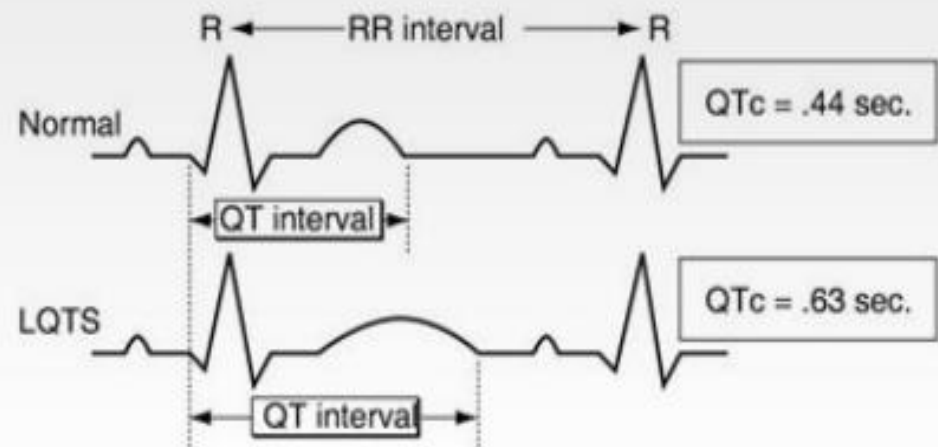
Long QT Syndrome (LQTS)

Long QT syndrome (LQTS) adalah suatu kondisi yang memengaruhi repolarisasi jantung setelah detak jantung. Ini mengakibatkan peningkatan risiko detak jantung tidak teratur yang dapat menyebabkan pingsan atau kematian mendadak.

Episode-episode ini dapat dipicu oleh olahraga atau stres. Dapat dilahirkan dengan mutasi genetic, beberapa obat, beberapa kondisi medis, seperti cacat jantung bawaan.

Laki-laki : QT interval (QTc) of > 440 msec . Perempuan : > 450 msec

Long QT Syndrome (LQTS)



Brugada Syndrome

Circulation: Arrhythmia and Electrophysiology

Volume 5, Issue 3, June 2012, Pages 606-616

<https://doi.org/10.1161/CIRCEP.111.964577>



ARRHYTHMOGENIC DISORDERS OF GENETIC ORIGIN

Brugada Syndrome

Yuka Mizusawa, MD and Arthur A.M. Wilde, MD, PhD

Key Words: Brugada syndrome ■ genetics ■ disease management ■ risk factors ■ death sudden

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Sindrom Brugada (BrS) :

Gangguan aritmia yang ditandai dengan ST elevasi dengan gelombang T negatif berturut-turut pada sadapan prekordial kanan tanpa kelainan jantung struktural.

Brugada adalah yang pertama kali melaporkan 8 pasien dengan VF Right bundle branch block dan ST-segment elevation pada EKG 12-lead

Brugada Syndrome

Typical ECG and Diagnosis

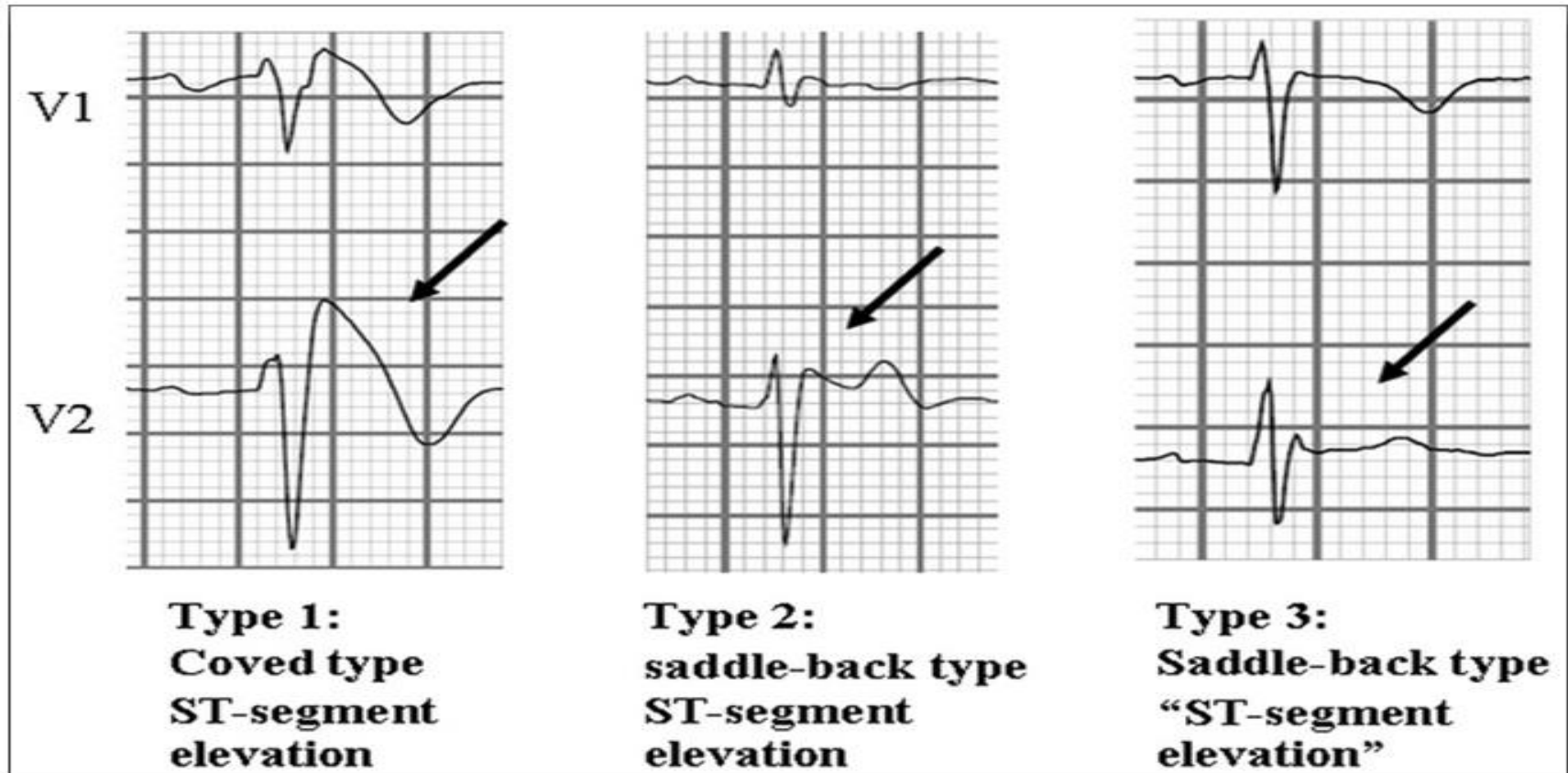


Figure 3. ECG abnormality diagnostic or suspected of Brugada syndrome. Type 1 ECG (coved-type ST-segment elevation) is the only diagnostic ECG in Brugada syndrome and is defined as a J-wave amplitude or an ST-segment elevation of ≥ 2 mm or 0.2 mV at its peak (followed by a negative T wave with little or no isoelectric separation). Type 2 ECG (saddle-back-type ST-segment elevation), defined as a J-wave amplitude of ≥ 2 mm, gives rise to a gradually descending ST-segment elevation (remaining ≥ 1 mm above the baseline) followed by a positive or biphasic T wave that results in a saddle-back configuration. Type 3 ECG is a right precordial ST-segment elevation (saddle-back type, coved type, or both) without meeting the aforementioned criteria.

Modern Management of Arrhythmias

The two principal tools of modern arrhythmia management :

1. Catheter Ablation

- Considered only for patients with refractory arrhythmias to a first line treatment.
- In addition it has expanded into the treatment of the “big two” arrhythmias : atrial fibrillation (AF) and atrial flutter

2. Device therapy

Lifesaving device in patients at risk of or with a history of ventricular arrhythmias.

Ablation

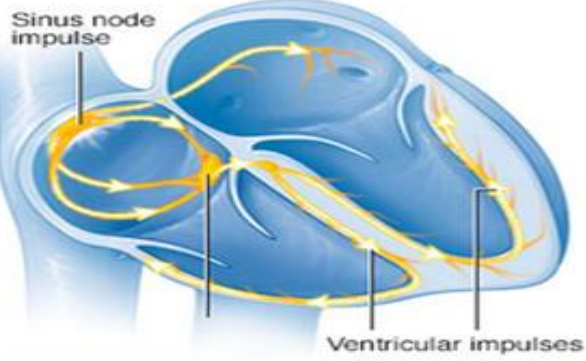
Ablasi adalah tindakan untuk mengatasi gangguan irama jantung atau aritmia dengan menggunakan kateter yang dimasukkan ke dalam ruang jantung untuk memutus (membakar) jalur konduksi tambahan ataupun focus-focus aritmia

Table 1 Indications for radiofrequency catheter ablation of cardiac arrhythmias

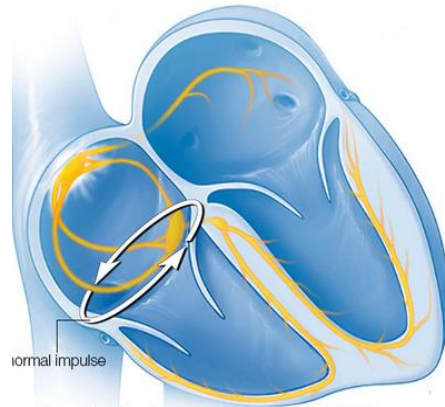
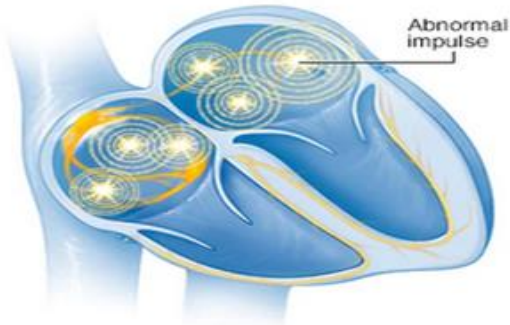
1st line therapy	2nd line after medical therapy	Occasionally useful
Wolff-Parkinson-White syndrome	Atrial flutter	Chronic AF
AV nodal re-entrant tachycardia (selected patients)	Paroxysmal AF Atrial tachycardia	VT in the presence of structural heart disease
“Normal heart” VT		

Ablation

Normal heart rhythm

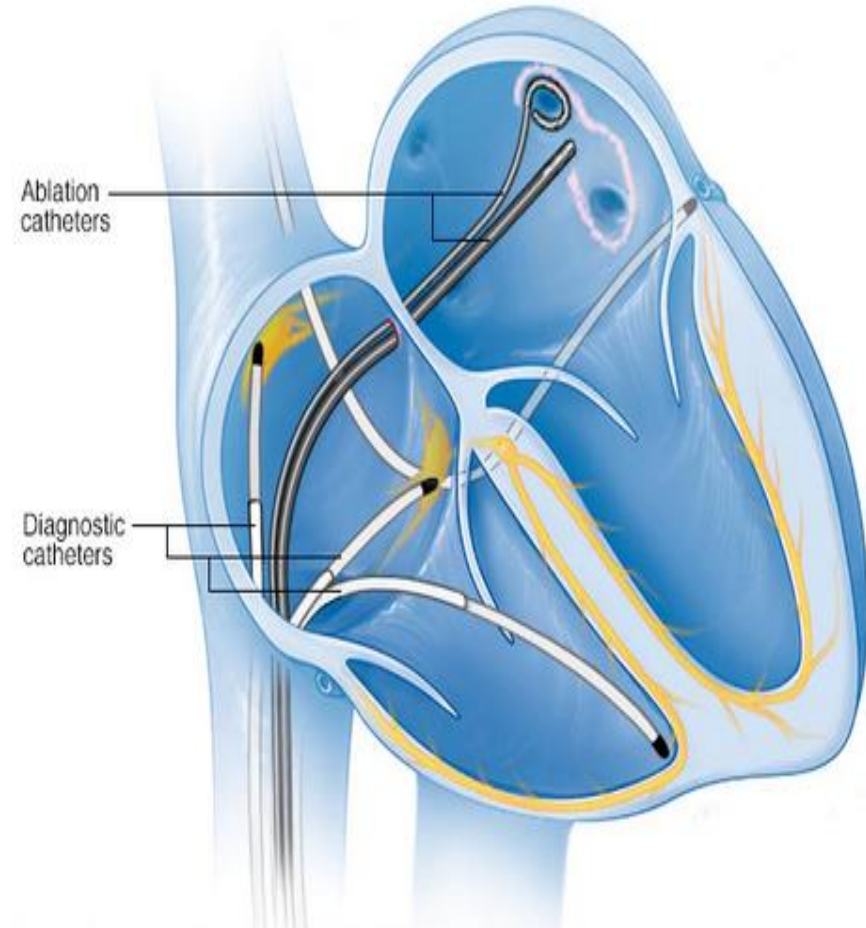


Atrial fibrillation (AFib)



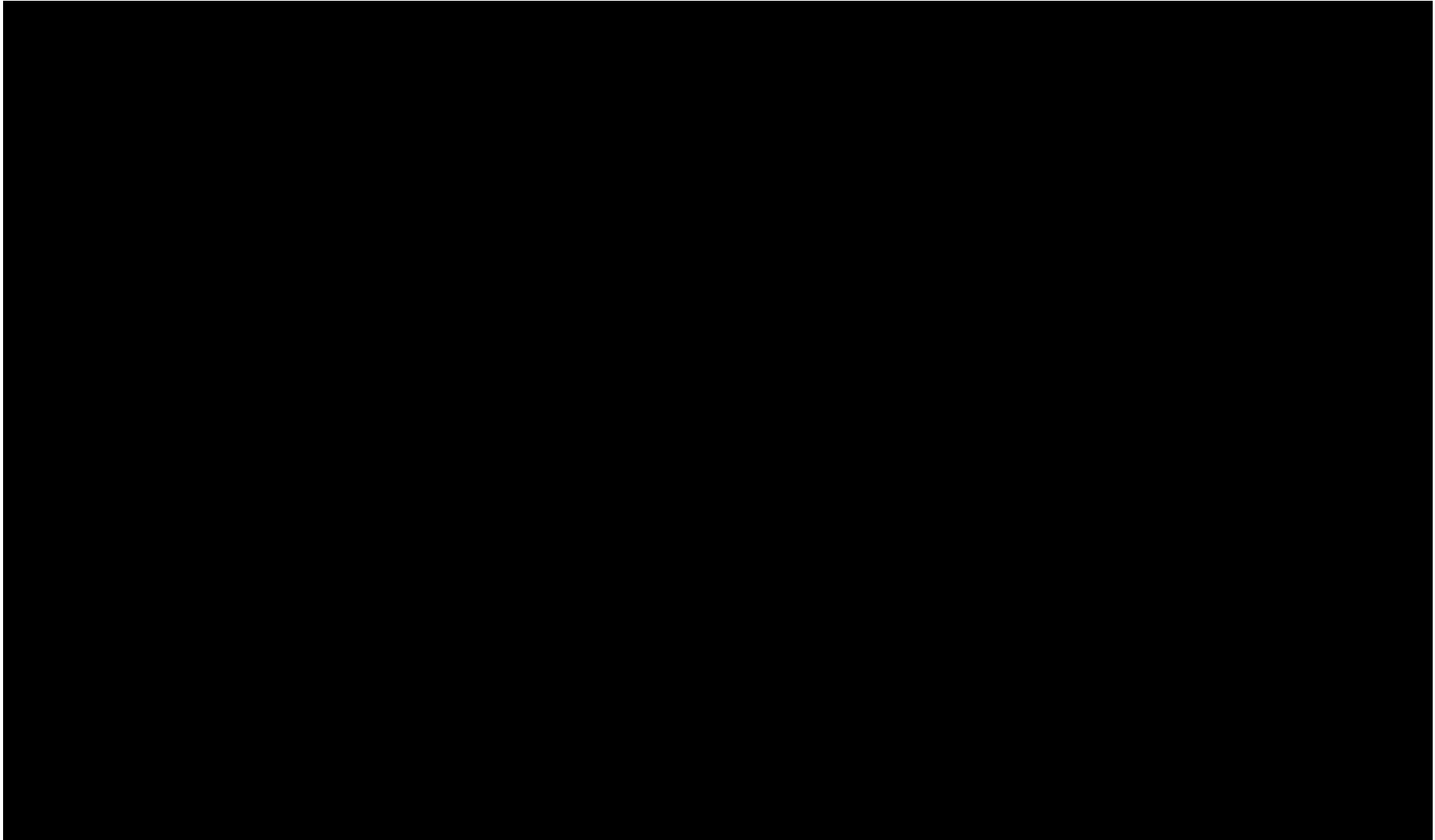
Ablation catheters

Diagnostic catheters



Ablation Procedure

Ablation Procedure



Implantable Cardioverter Defibrillators (ICDs)

- Modern ICDs have advanced algorithms that help to discriminate **ventricular arrhythmias**
- ICD implantation is first line therapy for **prevention of VT and VF**

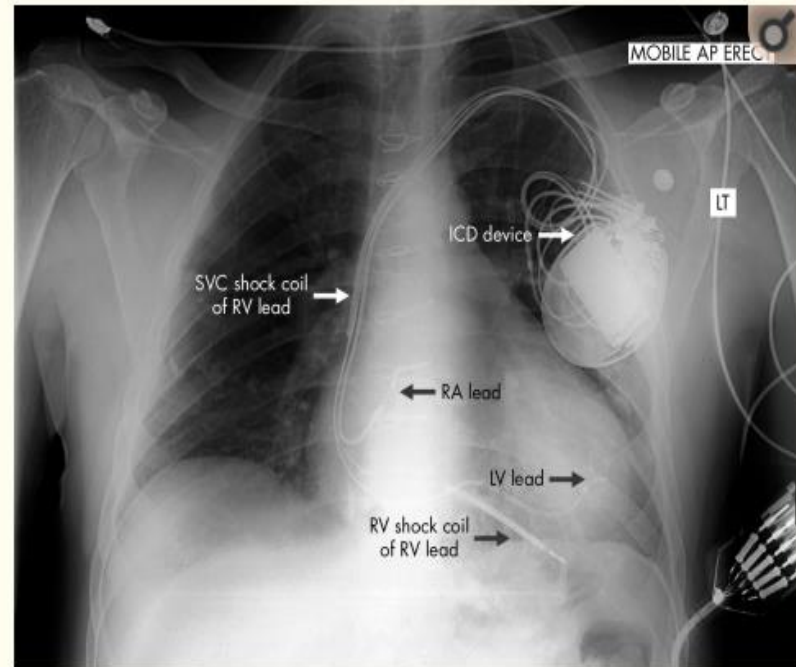


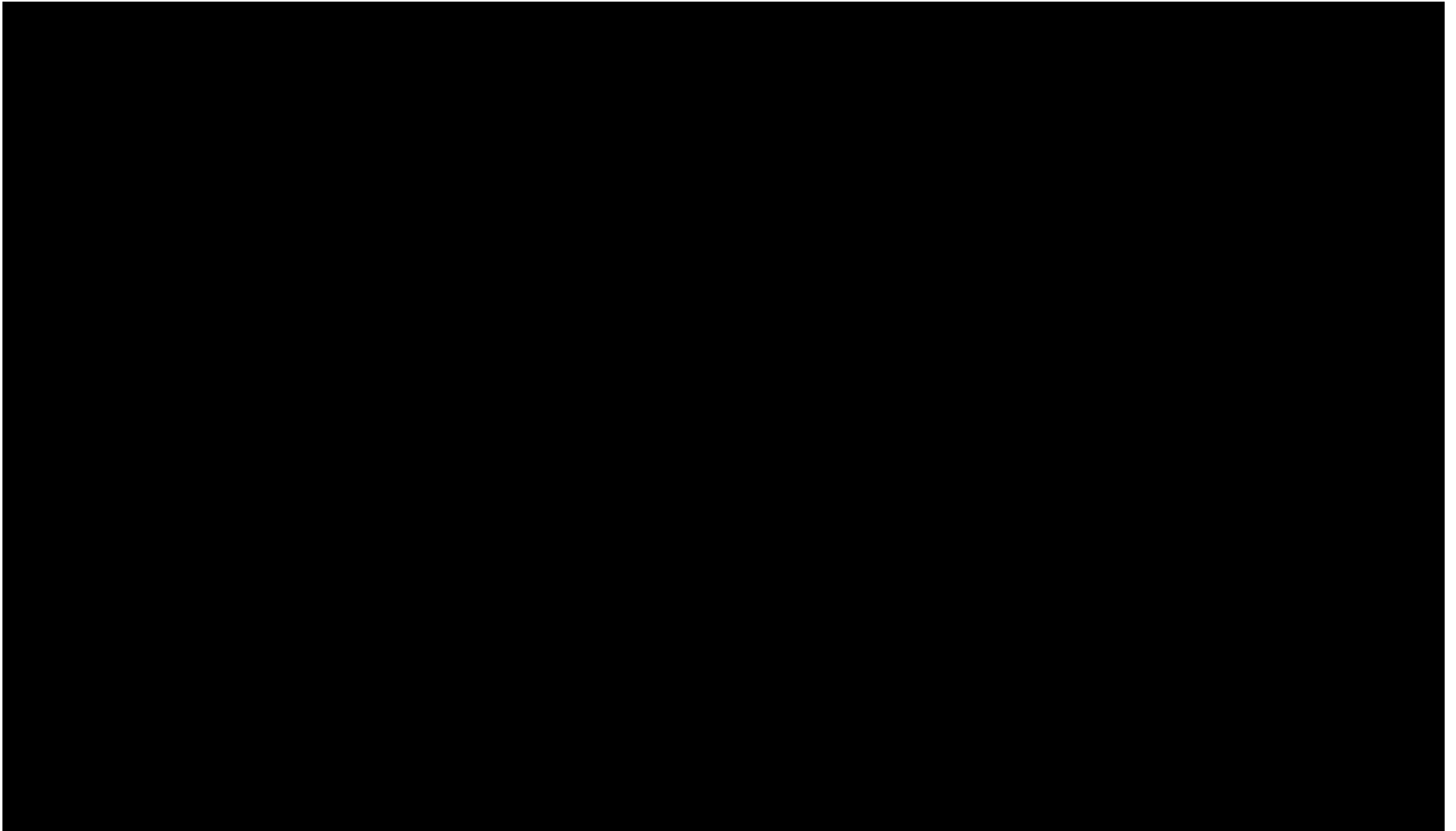
Figure 2 Chest radiograph showing a biventricular ICD in situ. Note the position of the device in the left pectoral region. A right ventricular lead with two shock coils, a right atrial lead, and a left ventricular lead (passed into an epicardial vein via the coronary sinus) are arrowed.

Implantable Cardioverter Defibrillators (ICDs)

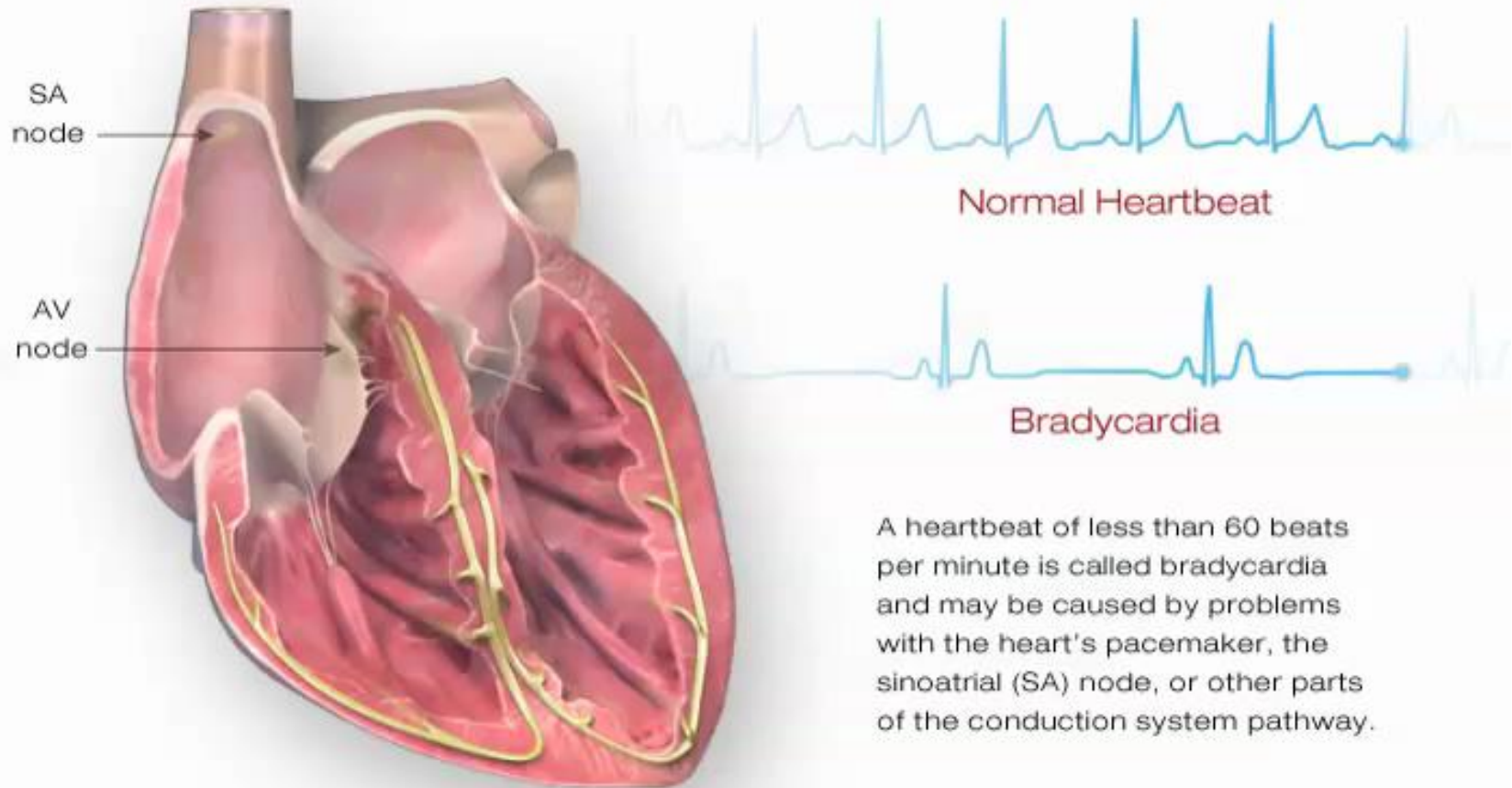
Table 2 Evidence based indications for ICD therapy

Primary prevention (patients at risk of VT or VF)	Secondary prevention (patients resuscitated from VT or VF)
Patients with class II or III heart failure of any aetiology with a LVEF <35%	Cardiac arrest attributable to VT or VF not attributable to a transient or reversible cause
Patients with class III heart failure and a QRS duration of >120 ms (these patients should be considered for a biventricular ICD)	Sustained VT or VF with haemodynamic compromise
Patients with LVEF <30% at least one month after MI or 3 months after CABG	Sustained VT or VF without haemodynamic compromise but with LVEF <35%
Non-sustained VT in patients with coronary disease, previous MI, LVEF <35% and inducible VT at electrophysiological study	
Familial condition with risk of SCD	
Brugada syndrome	
Long QT syndrome	
HOCM	

Implantable Cardioverter Defibrillators (ICDs)

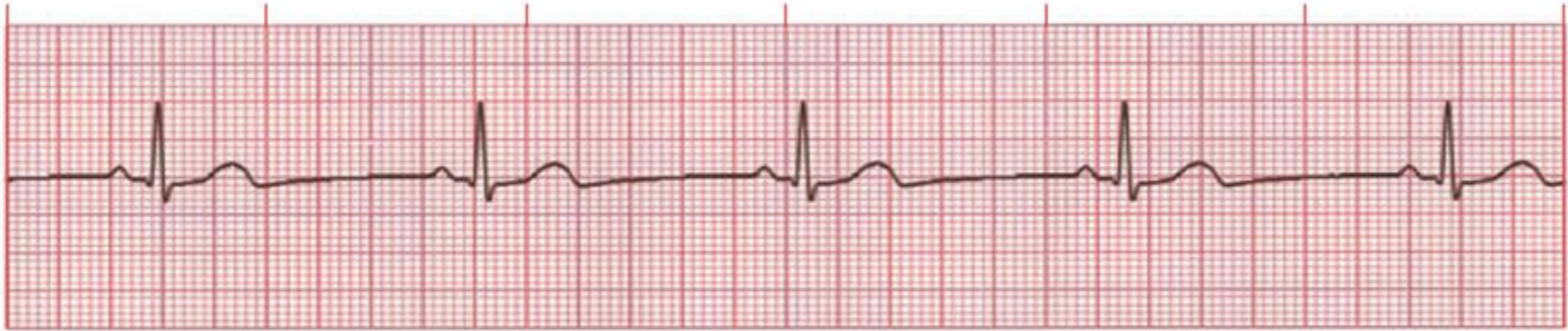


Bradikardi



Sinus Bradycardia

■ Results from slowing of the SA node.



Rate: Slow (<60 bpm)

Rhythm: Regular

P Waves: Normal (upright and uniform)

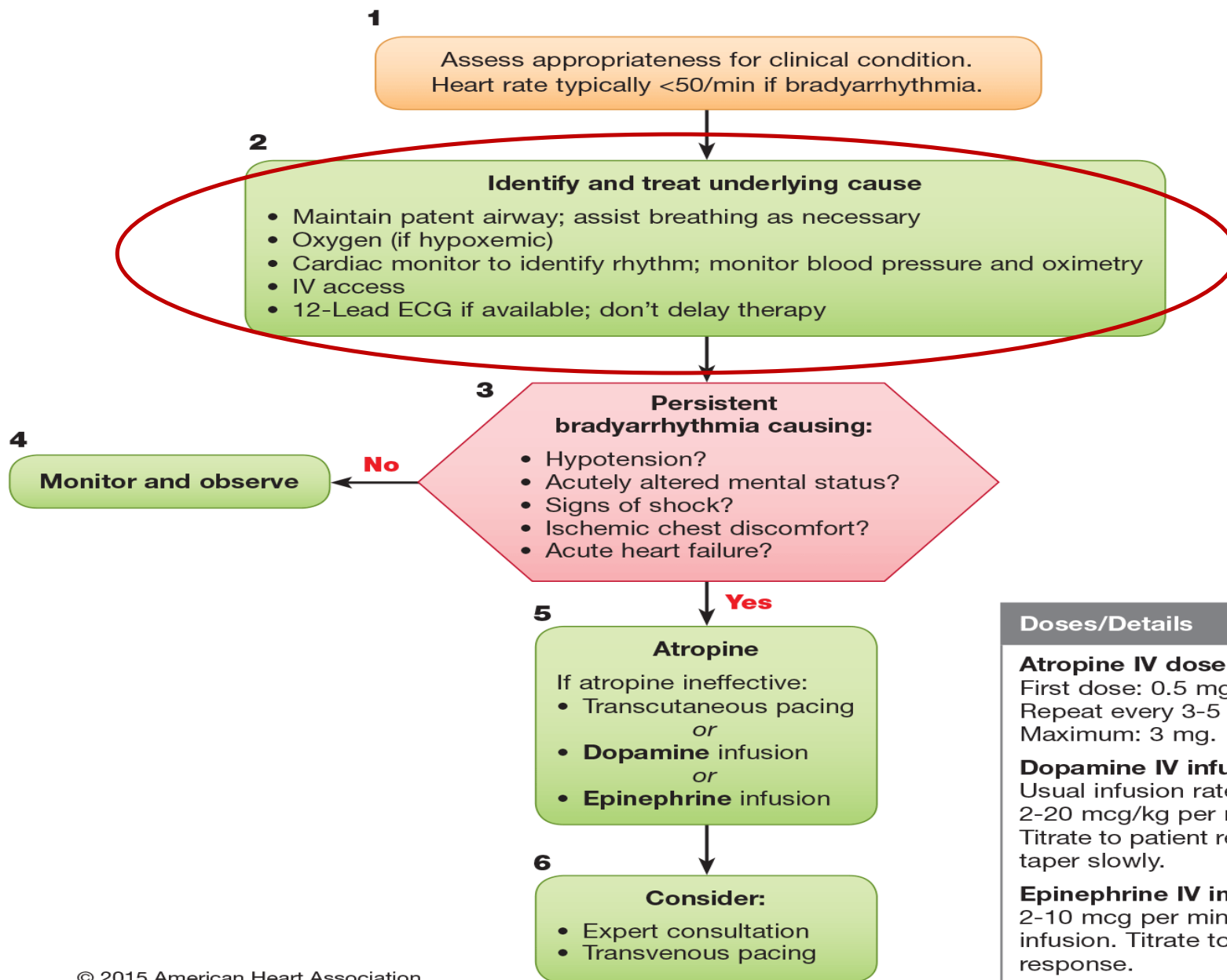
PR Interval: Normal (0.12–0.20 sec)

QRS: Normal (0.06–0.10 sec)

BRADHYCARDIA

- Hypoxia ?
- Sub febris ?
- Drugs efek ?
- Electrical impulse problem?

Adult Bradycardia With a Pulse Algorithm



Pacemaker

(Arrhythmia Device Therapy)

- Pemberian stimulus elektrik tambahan ke otot jantung bila mana denyut jantung tidak mampu menghasilkan curah jantung yang adekuat sesuai dengan kebutuhan fisiologis
- Menstimulasi jantung dalam menghentikan kejadian takikardia

Generator Temporary Pacemaker



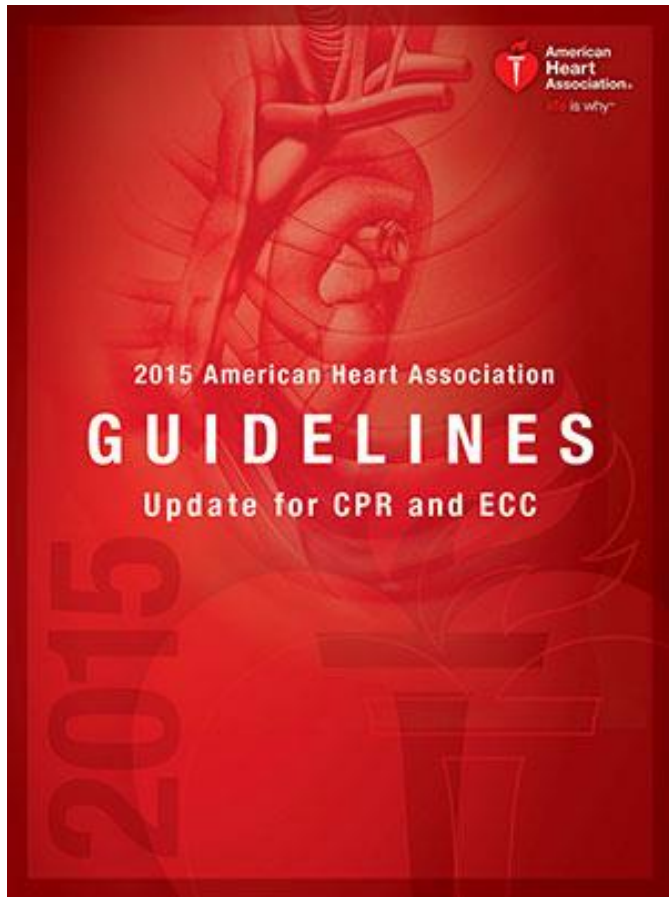
Single-Chamber



Dual-Chamber

Kesimpulan

1. EKG yang tidak normal disebut dengan Aritmia
2. Jenis aritmia yang berbahaya apabila menyebabkan penurunan kesadaran, gangguan hemodinamik, muncul tanda-tanda shock
3. Penanganan aritmia yang mengancam bergantung kepada jenis aritmia
4. Persiapan pasien, persiapan alat dan kesiapan operator harus diperhatikan dalam melakukan tatalaksana penanganan aritmia yang mengancam
5. Kolaborasi antar anggota tim dokter dan perawat dibutuhkan untuk keberhasilan pertolongan



Versi Lengkap
(293 halaman)



Versi Ringkasan
(36 halaman)

Dapat di-download **GRATIS** di situs:

<https://eccguidelines.heart.org/index.php/circulation/cpr-ecc-guidelines-2/>

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