Cardiology and Vascular Medicine Department
Medical Faculty of Andalas University
In Conjunction with
Indonesian Heart Association Padang Branch

6th SymC

DEPARTMENT OF CARDIOLOGY AND VASCULAR MEDICINE
MEDICAL FACULTY OF ANDALAS UNIVERSITY

Certificate of Attendance

This is to certify that

Dr. Eka Fithra Elfi, Sp.JP

as Speaker

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(Participant 12 SKP, Speaker 8 SKP, Moderator 6 SKP, Committee 1 SKP)

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3. RI PDdIKK. Gambaran kesehatan usia lanjut di Indonesia. Buletin Jendela Data dan Informasi Kesehatan 2013 .
4. Yuniadi Y, Tondan AE, Hanafy DA. Pedoman Tatalaksana Fibrilasi Atrium. Perhimpunan Dokster Spesialis Kardiovaskuler Indonesia, 2014.
5. Wyse DG, Waldo AL, DiMarco JP, et al. A comparison of rate control and rhythm control in patients with atrial fibrillation. *The New England journal of medicine* 2002;347:1825-33.
6. Camm AJ, Lip GY, De Caterina R, et al. 2012 focused update of the ESC Guidelines for the management of atrial fibrillation: an update of the 2010 ESC Guidelines for the management of atrial fibrillation--developed with the special contribution of the European Heart Rhythm Association. Europace : European pacing, arrhythmias, and cardiac electrophysiology : journal of the working groups on cardiac pacing, arrhythmias, and cardiac cellular electrophysiology of the European Society of Cardiology 2012;14:1385-413.
7. Issa ZF. Atrial Fibrillation. In: Miller JM, Zipes DP, eds. Clinical arrhythmology and electrophysiology: a companion to Braunwald's heart disease. 2nd ed: Saunders; 2012.

Aritmia Supraventrikular dan Ventrikular

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Pasien dengan gangguan irama jantung dapat terjadi dengan berbagai keluhan, namun gejala seperti palpitasi, sinkop, presyncope, atau gagal jantung kongestif umumnya menyebabkan mereka mencari pengobatan. Dalam menilai pasien dengan aritmia yang telah diketahui atau diduga, beberapa informasi penting harus diperoleh yang dapat membantu menentukan diagnosis atau panduan uji diagnostik lebih lanjut. EKG adalah alat utama dalam analisis aritmia. Mekanisme aritmogenesis yaitu gangguan formasi impuls, gangguan konduksi impuls, dan kombinasi (tabel 9.1).[1]

Disorders of Impulse Conduction

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TABLE 35-4 -- Mechanisms of Arrhythmogenesis

DISORDER	EXPERIMENTAL EXAMPLES	CLINICAL EXAMPLES
Disorders of Impulse Formation		
Automaticity		
Normal automaticity	Normal in vivo or in vitro in sinoatrial node, AV nodal, and Purkinje cells	Sinus tachycardia or bradycardia inappropriate for clinical situation; possibly ventricular parasystole
Abnormal automaticity	Depolarization-induced automaticity in Purkinje myocytes	Possibly accelerated ventricular rhythms after myocardial infarction
Triggered activity		
Early afterdepolarizations	Drugs (sotalol, *N*-acetylprocainamide, terfenadine, erythromycin), cesium, barium, low $[K^+]_o$	Acquired long-QT syndrome and associated ventricular arrhythmias
Delayed afterdepolarizations	Gain-of-function mutations in the gene encoding RyR2	Catecholaminergic polymorphic ventricular tachycardia

Tabel 9.1 Mekanisme Aritmogenesis
Sumber: Lilly, Leonard S. 2007.

Table 12.1.

Location	*Bradyarrhythmias*	*Tachyarrhythmias*
SA node	Sinus bradycardia Sick sinus syndrome	Sinus tachycardia
Atria		Atrial premature beats Atrial flutter Atrial fibrillation Paroxysmal supraventricular tachycardias Focal atrial tachycardia Multifocal atrial tachycardia
AV node	Conduction blocks Junctional escape rhythm	Paroxysmal reentrant tachycardias (AV or AV nodal)
Ventricles	Ventricular escape rhythm	Ventricular premature beats Ventricular tachycardia Torsades de pointes Ventricular fibrillation

AV, atrioventricular; SA, sinoatrial.

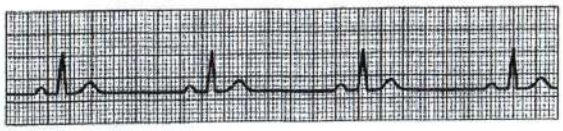
Tabel 9.2 Aritmia yang Umum Terjadi.
Sumber: Lilly, Leonard S. 2007.

Bradiaritmia[1,2]

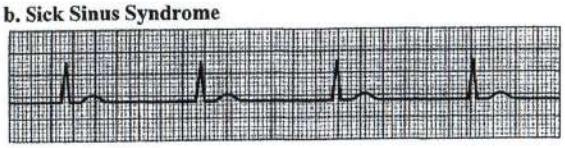
Rangsangan denyut jantung normal, akibat depolarisasi sinus nodul berulang, berkisar antara 60 sampai 100 kali/menit. Bradiaritmia adalah ritme dimana denyut jantungnya 60 kali/menit. Hal ini timbul dari gangguan formasi impuls atau gangguan konduksi impuls.

Sinoatrial Node

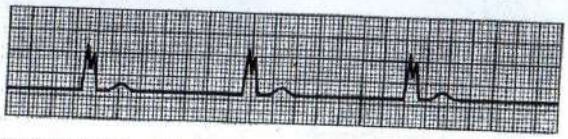
a. Sinus Bradycardia



b. Sick Sinus Syndrome



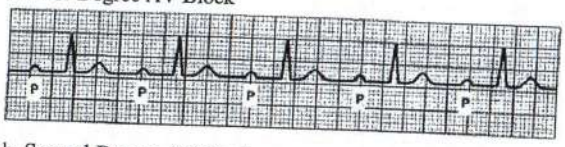
c. Escape Rhythms



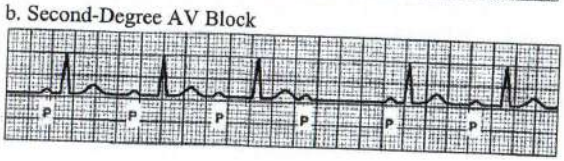
Atrioventricular Conduction System

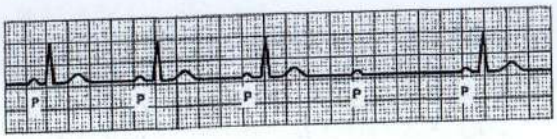
Sistem konduksi AV mencakup nodus AV, His bundle, dan kir dan kanan *bundle branches*. Gangguan konduksi antara atrium dan ventrikel bisa terjadi pada konduksi blok AV tipe tiga.[1]

a. First-Degree AV Block

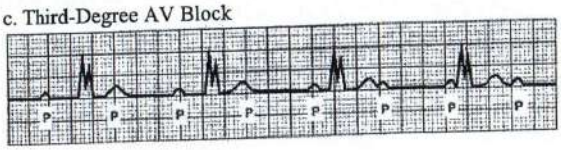


b. Second-Degree AV Block



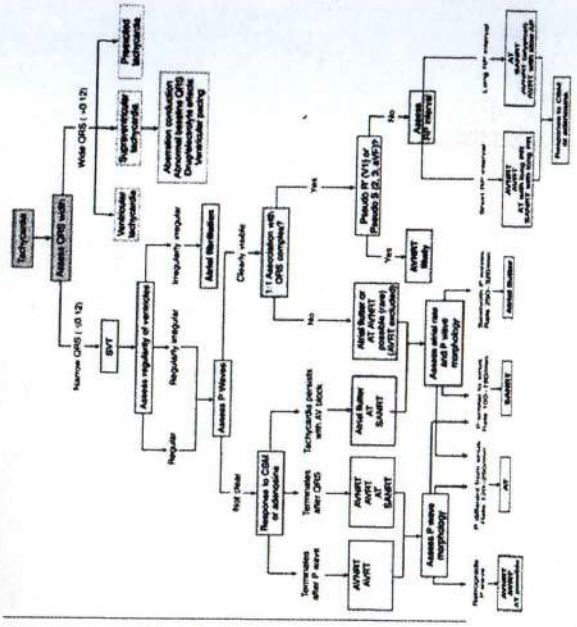


c. Third-Degree AV Block



Takiaritmia

Bila denyut jantung 100 bpm untuk tiga *beat* atau lebih, takiaritmia terjadi. Takiaritmia dihasilkan dari salah satu dari tiga mekanisme: peningkatan otomatisitas, *re-entry*, atau aktivitas yang dipicu. Takiaritmia dikategorikan ke dalam yang itu timbul di atas ventrikel (supraventrikular) dan yang timbul di dalam ventrikel. Pendekatan diagnosis takiarimia dapat dilihat pada gambar 9.3 di bawah ini.[1,2]

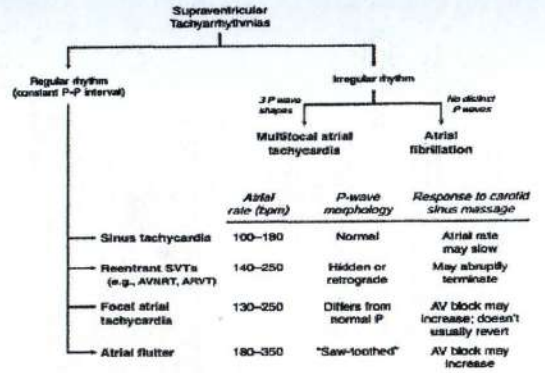


Gambar 9.3 Langkah Pendekatan Diagnosis Tipe Takikardia.
Sumber: Lilly, Leonard S. 2007.

Supraventricular Arrhythmias[1,2]

Gambar 9.6 di bawah ini menunjukkan skema untuk

membantu menyusun takiaritmia supraventrikular yang umum terjadi.



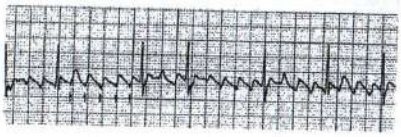
Gambar 9.6 Perbedaan Takiaritmia Supraventrikular Yang Umum Terjadi

Sumber: Lilly, Leonard S. 2007.

a. Sinus Tachycardia

b. Atrial Premature Beats

c. Atrial Flutter



d. Atrial Fibrillation

e. Paroxysmal Supraventricular Tachycardias

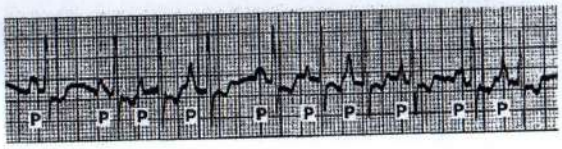
f. AV Nodal Reentrant Tachycardia

g. AV Nodal Reentrant Tachycardia

h. Concealed Accessory Pathways

i. Focal Atrial Tachycardia

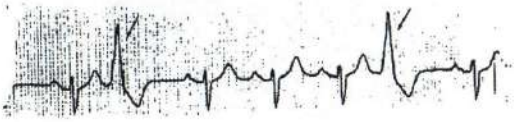
j. Multifocal Atrial Tachycardia



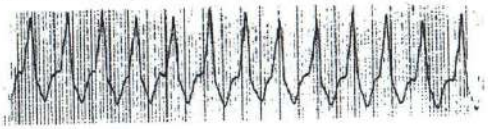
Aritmia Ventrikular[1,2,3]

Aritmia ventrikel yang umum adalah ventricular premature beats (VPBs), (2) ventricular tachycardia (VT), and (3) ventricular fibrillation (VF). Aritmia ventrikel biasanya lebih berbahaya dibanding supraventrikular. Gangguan yang bertanggung jawab atas sekitar 300.000 kematian jantung mendadak setiap tahun di Amerika Serikat.[1]

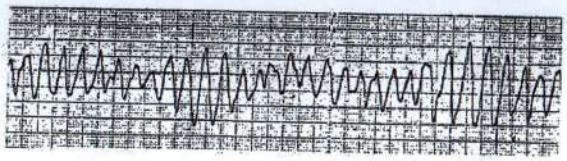
Ventricular Premature Beats



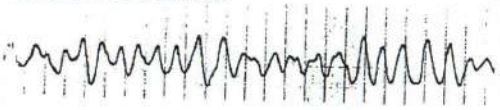
Ventricular Tachycardia



Torsades de Pointes



Ventricular Fibrillation



Obat Antiaritmia[2]

Tabel di bawah menjelaskan klasifikasi obat antiaritmia, mekanisme dan contoh obat.

Tabel 9.3 Klasifikasi Obat Antiaritmia

Class	General Mechanism	Examples
I	Na^+ channel blockade	
IA	Moderate block (↓↓ phase 0 upstroke rate; prolonged AP duration)	Quinidine Procainamide Disopyramide
IB	Mild block (↓phase 0 upstroke rate; shortened AP duration)	Lidocaine Mexiletine
IC	Marked block (↓↓↓ phase 0 upstroke rate; no change in AP duration)	Flecainide Propafenone
II	β-Adrenergic receptor blockade	Propranolol Esmolol Metoprolol
III	K^+ channel blockade (prolongation of action potential duration)	Amiodarone Dronedarone Sotalol Ibutilide Dofetilide
IV	Ca^{++} channel antagonists	Verapamil Diltiazem

AP, action potential.

Kepustakaan

1. Kasper M, Bartsch P, Gibbs JS, Weir EK, Buckler KJ. Pulmonary Hypertensio. In: Bonow RO, Mann DL, Zipes DP, Libby P, Braunwald E, eds. *Braunwald's heart disease : A text book of cardivascular medicine.* Philadelphia: Elsevier Saunders; 2012:771-822
2. Lilly, Leonard S. 2007. Pathophysiology of heart disease : a collaborative project of medical students and faculty. 4th ed. LippincottWilliams & Wilkins. Philadelpia. 279-299
3. Silvia G. Priori, Carina Blomstro¨m-Lundqvist, Andrea Mazzanti et al. 2016. Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death (ESC). European Heart Journal; 36, 2793–2867