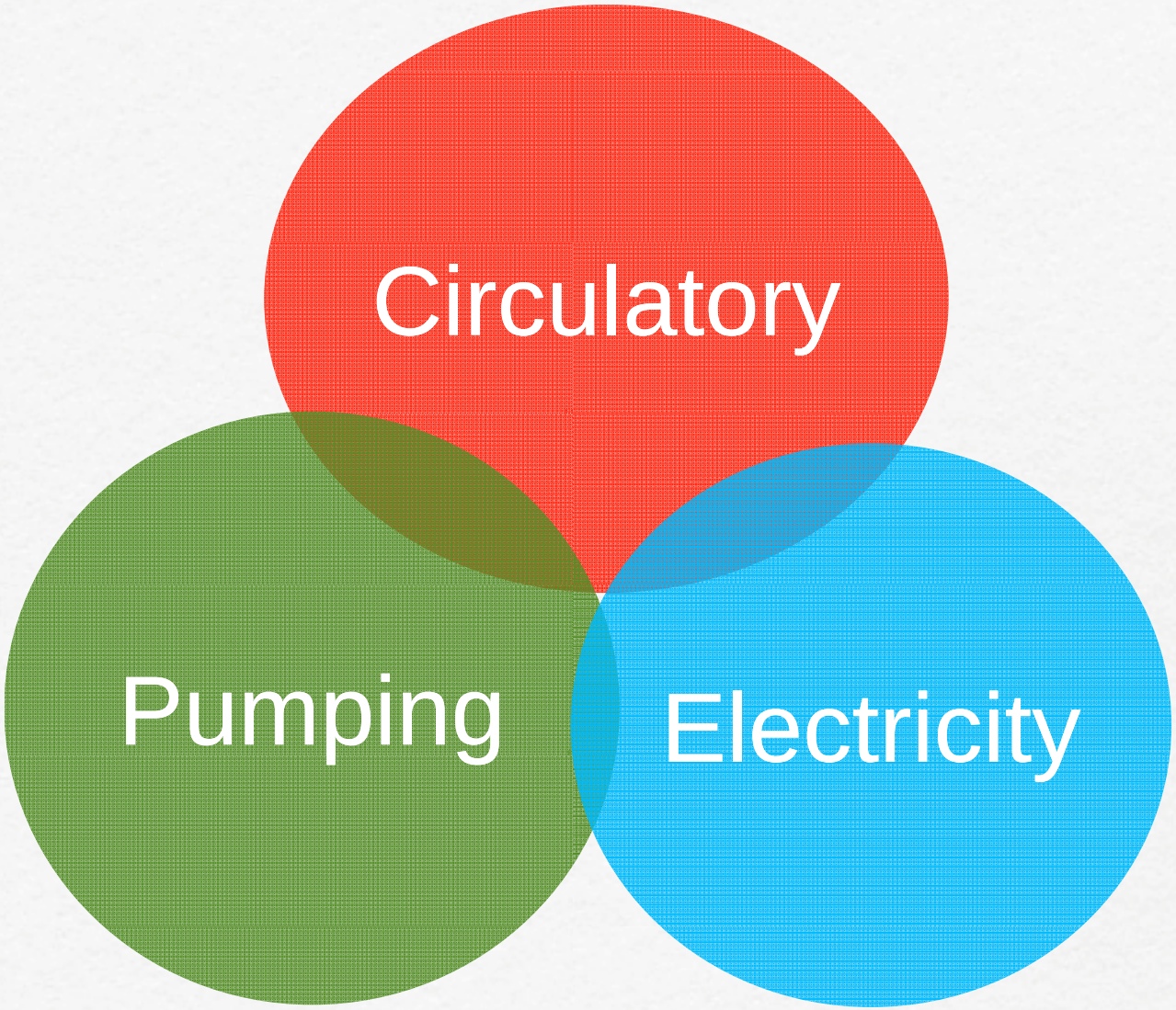
Rehabilitation for patients with arrhythmia, Defibrillator and valvular heart disease

Asst. Prof. Visal Kantaratanakul, MD., FIMS
Director, Rehabilitation Center
Samitivej Srinakarin
ravkn@yahoo.com


Circulatory
Pumping
Electricity

rhythmias

- Exercise induced arrhythmia
- Arrhythmia that contradicted for exercise

e-threatening arrhythmia

- Lethal
  - Long QT
  - Burgada
  - VF, VT
- Non Lethal
  - exercise induced arrhythmia
  - Too fast or too slow

nciples of Arrhythmia Recognition and Mx

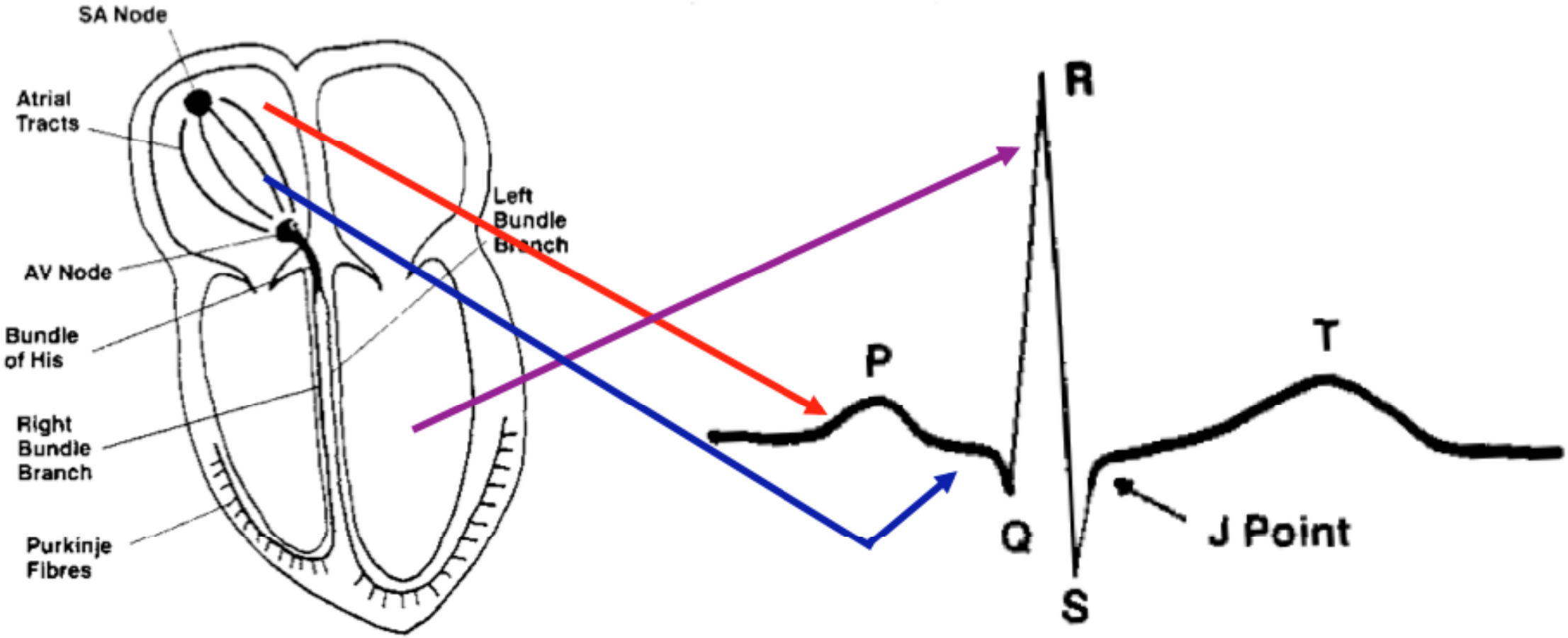
Treat or look at the patient.... not monitor

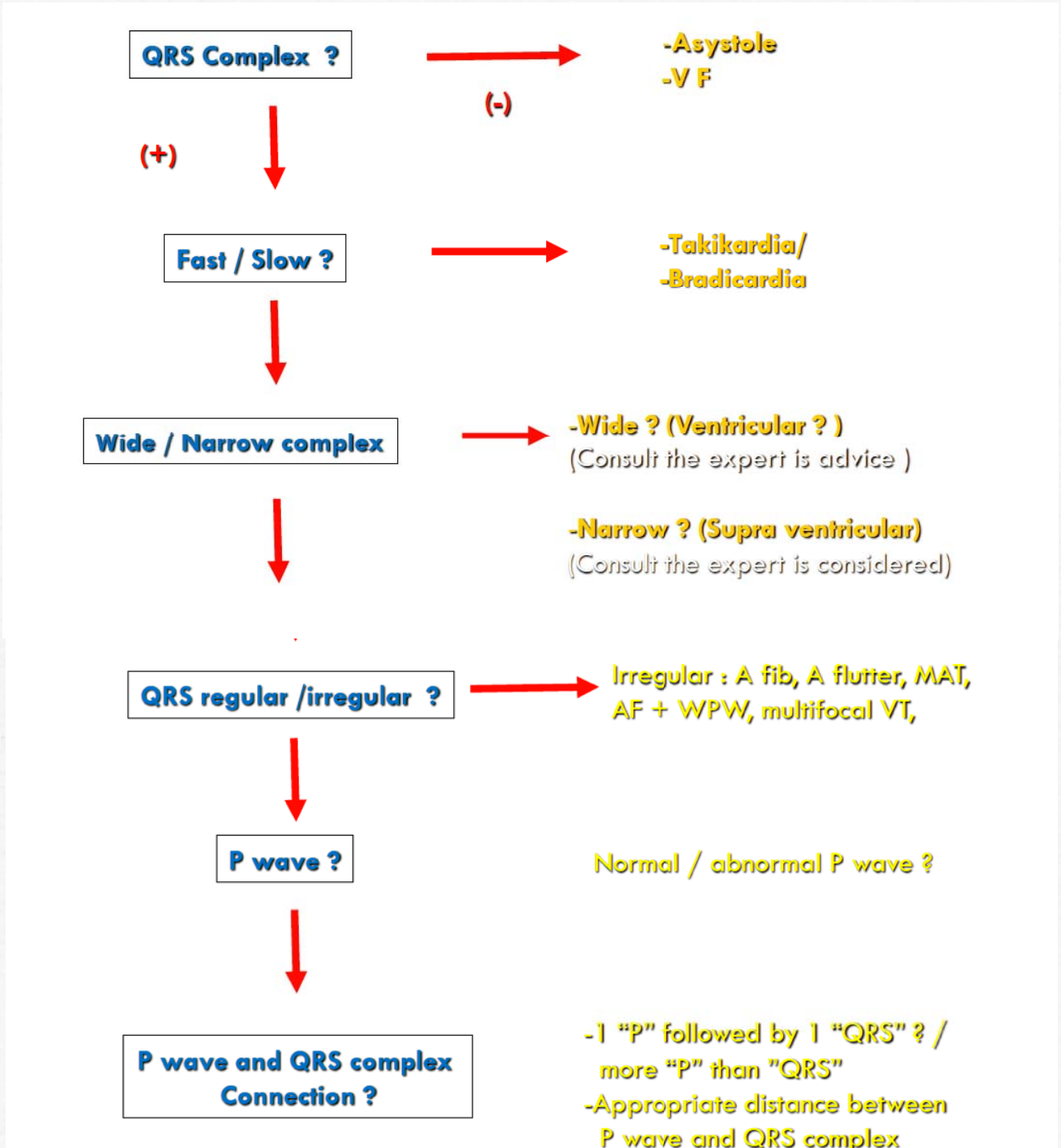
Evaluation the patients

- ventilation
- Oxygenation
- HR, BP
- Signs of inadequate organ perfusion

art with simple ones

- Is there any P ?
- Is there any too long for PR ?
- Is there any bizarre QRS ?
- Is there other part that too long ?
- Is there any abnormal on ST ?
- Is there any abnormal T ?
- Is there any change during exercise ?


SA Node
Atrial Tracts
AV Node
Bundle of His
Right Bundle Branch
Purkinje Fibres
Left Bundle Branch
R
P
T
Q
S
J Point


QRS Complex ?
(-)
-Asystole
-V F
(+)
Fast / Slow ?
-Takikardia/
-Bradicardia
Wide / Narrow complex
-Wide ? (Ventricular ?)
(Consult the expert is advice)
-Narrow ? (Supra ventricular)
(Consult the expert is considered)
QRS regular /irregular ?
Irregular : A fib, A flutter, MAT,
AF + WPW, multifocal VT,
P wave ?
Normal / abnormal P wave ?
P wave and QRS complex
Connection ?
-1 "P" followed by 1 "QRS" ? /
more "P" than "QRS"
-Appropriate distance between
P wave and QRS complex

ercise considerations for hythmic patient

- Need EST and monitoring
- No contraindication
- No exercise-induced arrhythmias
- Fixed percentage of MHR with Ceiling < 10-20 beats of arrhythmia
- RPE might not work well

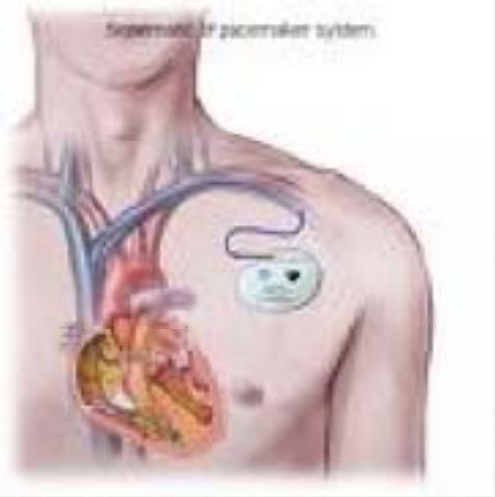
contraindications

- Uncontrolled HR > 120 BPM
- HIgh ST depression
- High grade PVC
- 2nd or 3rd degree block
- VT

alignant PVCs

- Frequent PVCs
- Multiform PVCs
- Runs of consecutive PVCs
- R on T phenomenon
- PVC during AMI

acemakers



- Single or dual chamber
- Pacemakers now store lots of information that can be reviewed at follow-up eg % time spent in AF
- Now extremely programmable with many features & algorithms
- Rate responsiveness (HR in response to activity)
- AF suppression (pacing the atria)
- Rate drop acceleration response

ventricular pacemakers

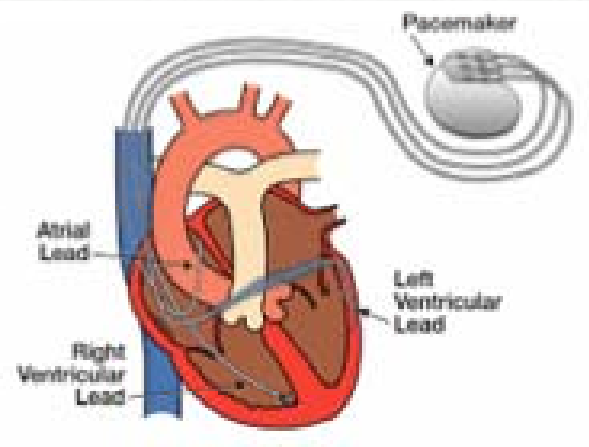
lso known as Cardiac Resynchronization
herapy (CRT)

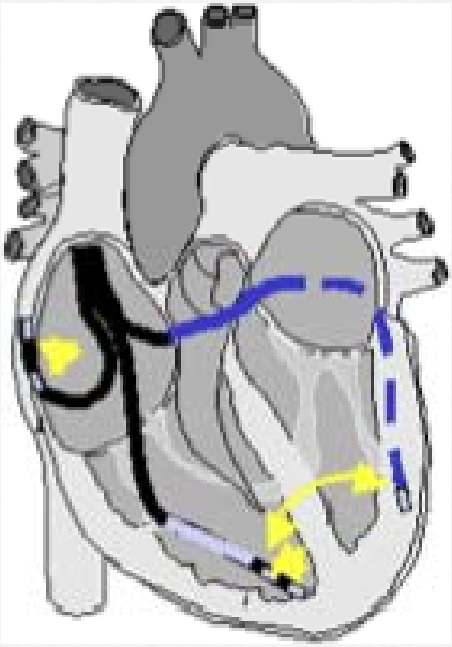
lay be patients for whom chronic RV pacing
becoming problematic

leads usually (atria, RV and LV)

acing both ventricles in a timed manner
llowing resynchronisation

ptimises cardiac output by allowing
ppropriate ventricular filling and co-ordinated
ontraction





lantable Cardiac Defibrillators (ICDs)

Ability to DC shock for VF, VT

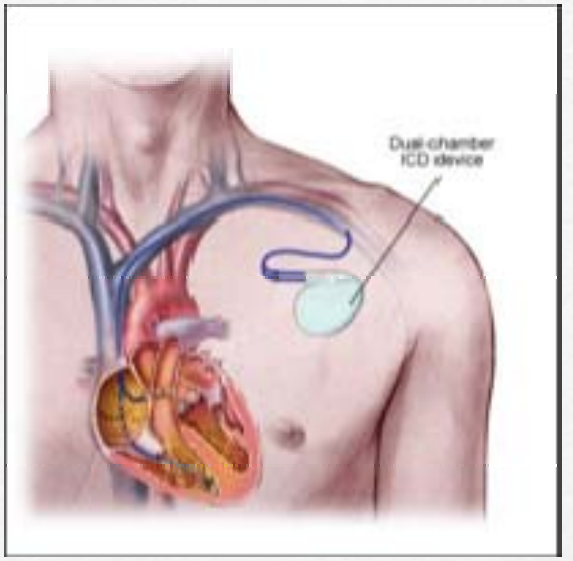
700-800 Volts or 30-40 Joules

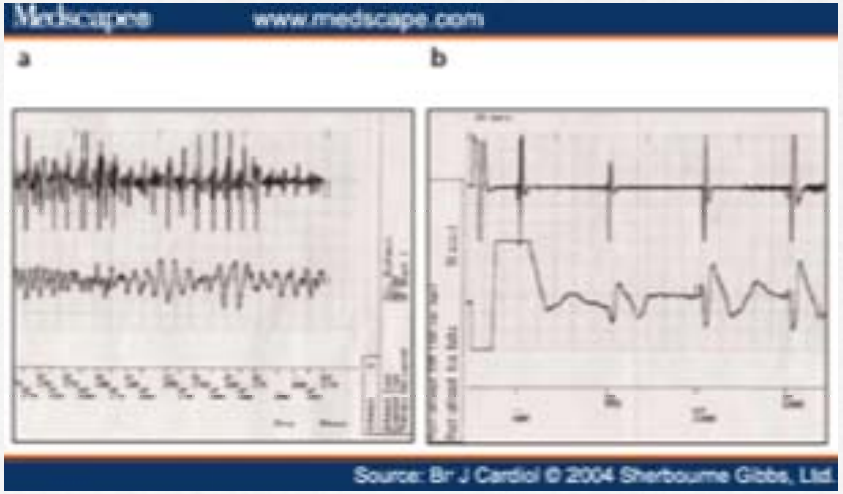
Most now can also deliver ATP (anti-tachy pacing) to attempt to reduce need for shock therapy

Extremely complex devices that have many programmable features

Set-up and management is often quite tricky eg in the presence of AF

Most devices are also able to pace although most patients do not have a primary pacing





ication for device implant

Pacemakers

- SSS, AVB, CHB, CI, Chronic AF with bradycardia, Symptomatic Bifasicular block / Trifasicular block, Neurally mediated syncope (CSS, VVS, situational syncope)

Biventricular pacemakers (CRT-P)

- CHF with LBBB & low EF(<35%), dysynchrony on echo, long PR with poor haemodynamics, NYHA class IV

ication for device implant

Implantable Cardiac Defibrillators(ICDs)

- Primary indication; significant risk of life threateni arrhythmia eg Long QT, Brugada, DCM, Post MI with NSVT & poor EF
- Secondary indication; survival of a VT or VF arre

Biventricular ICD (CRT-D)

- CHF with LBBB & low EF(<35%), dysynchrony on echo, long PR with poor haemodynamics, NYHA class III or IV, pri

Psychological Characters and Exercise in Patients with AICD

Please close your eye and think

What do you think if you sit in a car that
it/accident badly ????

Then next several minutes that car go
fire and you struck inside

ychological components

- Patient
  - Depression
  - Anxiety
- Relatives
  - Anxiety
  - Fear

acts

here are both sides of studies: there are
fference/ no difference in psychologcal variabl
etween patient with/without AICD

ore spouse anxiety if there is/are shock storm

ain problems with type D personality(distresse

นายบัว ยศสมบัติ อายุ 55 ปี

หน่วยโรคหัวใจ ภาควิชาอายุรศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี
มหาวิทยาลัยมหิดล ถนนพระราม 6 กทม. 10400
โทร. (622) 2011612, 2011617, 2011627 โทรสาร (622)2011668

Division of Cardiology, Faculty of Medicine, Ramathibodi Hospital Mahidol University,
Rama VI Road, Bangkok 10400 **Tel.(662) 2011612, 2011617, 2011627**
Fax. (662)2011668

Patient: นายบัว ยศสมบัติ	HN.4419743	Cath #3201000373
Age: 55 yr	Sex: Male	Date: August 3, 2010
Weight	Height	BSA

Automated implantation cardiovertor defibrillator

Procedure: AICD implantation
Indication: S/P AVR with poor LV with VT
Consent: obtained with signature
Pre-Medication: Cefazolin
Anesthesia: 2% Lidocaine 20 ml at Lt. Infraclavicular area, IV fentanyl& diazepam
Portal of entry & Technique: Left axillary vein
Intravascular sheath: 9 Fr
Problem or incident during the procedure: none

and external pacing/defibrillation patches. The patient was sedated with IV midazolam and fentanyl. The patient was prepped and draped in sterile fashion. Lidocaine was used as a local anesthetic. Intravenous contrast was used to locate the left axillary vein. Incision was made along vein path. The medial axillary vein was entered under fluoroscopic guidance. Using a peel away sheath technique the RV lead was placed in the RV apex with adequate parameters. The lead was anchored in placed with a non-absorbable suture. The leads were then connected to the generator. The assembly was then placed in the pocket. DFT was done using ULV method. The generator was anchored to the prepectoral fascia with a non-absorbable suture. The pocket was then inspected for bleeding. Hemostasis was ensured. The pocket was closed in layers. The patient tolerated the procedure well, and transferred from the lab in stable condition.

Defibrillation Efficacy Testing:

Using ULV method, VF was induced at 400/310 ms train CL with 1.1 J shock. DC 11 J was failed to terminated VF. Then 21 J DC was successfully defibrillated VF. Therefore DFT was 21 J.

Technical data

Right Ventricular lead: Guidant 0158serial #235252, DOI August 3, 2010
Generator : Guidant Teligen 100 F102 serial #018667, DOI August 3, 2010

1. Threshold	1.5V@0.4ms
2. R wave sense	8.8 mV
3. P/S Impedance	550 ohms / shocking impedance 40 ohms

people experience?

ACUTE PHASE (Hospital)

Initial Euphoria – I've survived

Increased anxiety and depression

Misconceptions

“You will be alright if you are careful”

Interpreted

?

“If I am not careful I will die”

“You were lucky this time”

Interpreted

?

“I won’t be lucky next time”

“It is only a warning”

Interpreted

?

“Something terrible is yet to come”

OOR DISCHARGE

Depressed

Anxious

Misattribution of somatic symptoms

Physical Deconditioned – fear avoidance

Over/under involvement spouse/partners

Sexual difficulties

Time off work / lifestyle changes

6% reduction non-fatal cardiac events

1% reduction in mortality

years follow up (Ref: *Linden et al 1996*)

xercise based interventions may have

ositive effect of patients – physical ability to exercise

nprove some physiological measures of cardiac disease

but do not impact on

ood lipids

orbidity

verall mortality

sufficient evidence re psychological and social outcomes

xercise in Patient with AICD

Important thing is to clarify state of psychological problems and fix them as much as you could

ercise considerations for pacemaker CD patient

- Fixed VS. adjustable rate
- Monitor systolic pressures
- Extended warm-up and cool down
- ICD: ECG monitoring/pulse to titrate intensity
- Rate modulated pacemakers intensity:
  - MHRR method of Karvonen
  - Fixed percentage of MHR
  - RPE

Cardiac Rehabilitation in VHD

mitation of Ex/activity

- overprotected by their parents
- overprotected by their environment
- Physical conditions

ormalized of exercise pacity

- Age of surgery
- Pulmonary hypertension
- Method of correction

Left-to-right shunts

- Atrial septal defect
- Ventricular septal defect

Valvular heart lesions and obstructive anomalies

- Aortic stenosis
- Pulmonary valve disease
- Coarctation of the aorta

Cyanotic congenital heart disease

- Tetralogy of Fallot
- Transposition of the great arteries

rial septal defect (ASD)

- right volume overload
- increased pulmonary blood flow
- resulting in pulmonary hypertension
- normal or only slightly impaired aerobic exercise capacity
- the age at surgery has been shown to influence

ventricular septal defect

- left ventricular volume overload resulting in left ventricular dilatation
- higher pulmonary to systemic flow ratio
- The relative shunt fraction has been shown to decrease with the increasing intensity of exercise
- Exercise performance have been shown to be slightly decreased when compared with age-matched controls

onditions the decrease Ex.
pacity

- AS
- Pulmonary valve disease
- Tetralogy of Fallot
- Transposition of the great arteries

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Special ESC article

Recommendations for the management of patients after heart valve surgery

Eric G. Butchart*, Christa Gohlke-Bärwolf, Manuel J. Antunes, Pilar Tornos, Raffaele De Caterina, Bertrand Cormier, Bernard Prendergast, Bernard Iung, Hans Bjornstad, Catherine Leport, Roger J.C. Hall, and Alec Vahanian on behalf of the Working Groups on Valvular Heart Disease, Thrombosis, and Cardiac Rehabilitation and Exercise Physiology, European Society of Cardiology

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KEYWORDS
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Thrombosis;
Thromboembolism;
Endocarditis;
Haemolysis;
Pregnancy

Approximately 50 000 valve replacement operations take place in Europe annually and almost as many valve repair procedures. Previous European guidelines on management of patients after valve surgery were last published in 1995 and were limited to recommendations about antithrombotic prophylaxis.[1] American guidelines covering the broader topic of the investigation and treatment of patients with valve disease were published in 1998 but devoted relatively little space to post-surgical management.[2] This document represents the consensus view of a committee drawn from three European Society of Cardiology (ESC) Working Groups (WG): the WG on Valvular Heart Disease, the WG on Thrombosis, and the WG on Rehabilitation and Exercise Physiology.

In almost all areas of patient management after valve surgery, randomized trials and meta-analyses do not exist. Such randomized trials as do exist are very few in number, are narrowly focused with small numbers, have limited general applicability, and do not lend themselves to meta-analysis because of widely divergent methodologies and different patient characteristics. Recommendations are therefore almost entirely based on non-randomized studies and relevant basic science.

e early post-operative period
d rehabilitation

commendations

(i) The benefits of rehabilitation following coronary artery surgery have been well documented, and one study following valve surgery has demonstrated similar benefits from exercise training.[3] A multidisciplinary rehabilitation programme should therefore be available for all patients undergoing valve surgery. This is particularly important for patients whose post-operative course has been complicated by heart failure.

ii) Whether rehabilitation should be conducted on an inpatient or outpatient basis should be determined by the availability of local facilities and the pattern of the patient's recovery.[4]

ii) Baseline echocardiography should be performed on all patients post-operatively and at the completion of rehabilitation to permit comparison with future studies during long-term follow-up.[5]

(iv) Patients should be educated about anticoagulat including drug interactions and self-managemer appropriate,[6] about the recognition of impor symptoms and about the elements of a hea lifestyle.

(v) Selected patients should be offered exercise trair bearing in mind that exercise tolerance after m valve replacement (MVR) is much lower than after aortic valve replacement (AVR), particular there is residual pulmonary hypertension.[7]

(vi) Good candidates for exercise training include pati with AVR and normal left ventricular (LV) function patients who have undergone successful mitral v repair with preserved LV function.[8] Patients likel be suitable should undergo a submaximal exer test about 2 weeks after surgery to guide deta exercise recommendations.

Antithrombotic management

Recommendations

Exercise recommendations and restrictions in patients with congenital heart disease

type	Exercise – restriction or recommendation
	All sports
ed or small unoperated and PFO)	Avoid scuba diving
	All sports
ed or small unoperated)	All sports
	All sports
stenosis	
(PIG <21 mmHg)	All sports exception: high static or high dynamic sports
erate (PIG 21–49 mmHg)	Low dynamic and static sports
ary stenosis	
(PIG <30 mmHg) or treated	All sports
erate (PIG 30–50 mmHg) or treated	Low and moderate dynamic and low static sports
ation of aorta	
ystemic hypertension	Low and moderate dynamic and sports
between upper and lower limb (21 mmHg)	
SBP (213 mmHg)	
gy of Fallot	
r only mild RVOT obstruction	Low and moderate static and dynamic sports
more than mild pressure response	
arrhythmia	
erate residual lesion right ventricle <50% of system pressure	Low static and dynamic
rial switch	No restrictions except high static, high dynamic sports
switch	Mild to moderate restriction

d from Peliccia *et al.* [2] and Graham *et al.* [26], with permission. ASD, Atrial septal defect; AVSD, atrioventricular septal defect; PFO, patent foramen ovale; PI
stantaneous gradient; RVOT, right ventricle outflow tract; SBP, systolic blood pressure; TGA, transposition of the great arteries; VSD, ventricular septal defe

Any Questions