

# EVALUATION AND MANAGEMENT OF PALPITATIONS

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# OBJECTIVES

- Understand the definition
- Know the possible etiologies
- How to assess the patient
- How to manage palpitations

# Case 1

- 42 year old man presented with 6 months history of recurrent skipping of heart beats and sinking feeling on the chest. Also has been treated for peptic ulcer for about 1 year. No chest pain and no other symptoms. No hx of HTN or other medical condition
- Been going through stress at work and Mother is receiving radiotherapy for breast Ca.
- examination- normal finding

# Case 1- True/false

- Guest only has anxiety?
- No further investigation is needed?
- Give Amitriptyline and refer to Psychiatrist?

# IMPORTANT NOTICE

- ***“All palpitations are not arrhythmias and many arrhythmias do not palpitate”***
- ***Palpitation does NOT necessarily mean heart disease***
- ***The degree of palpitation does not equal the severity of the heart disease***

# INTRODUCTION

- Common and nonspecific symptom
- Often benign in origin but also the most common symptom of a life-threatening arrhythmia
- This sensation can be either intermittent or sustained and either regular or irregular

# INTRODUCTION- DEFINITION

## VARIOUS DEFINITIONS AND DESCRIPTIONS

1. Rapid pulsations
2. Abnormally rapid or irregular beating of the heart
3. Perception of a skipped beat or rapid fluttering in the chest
4. Pounding sensation in the chest or neck
5. Uncomfortable awareness of one's own heartbeat or undue awareness of heart action

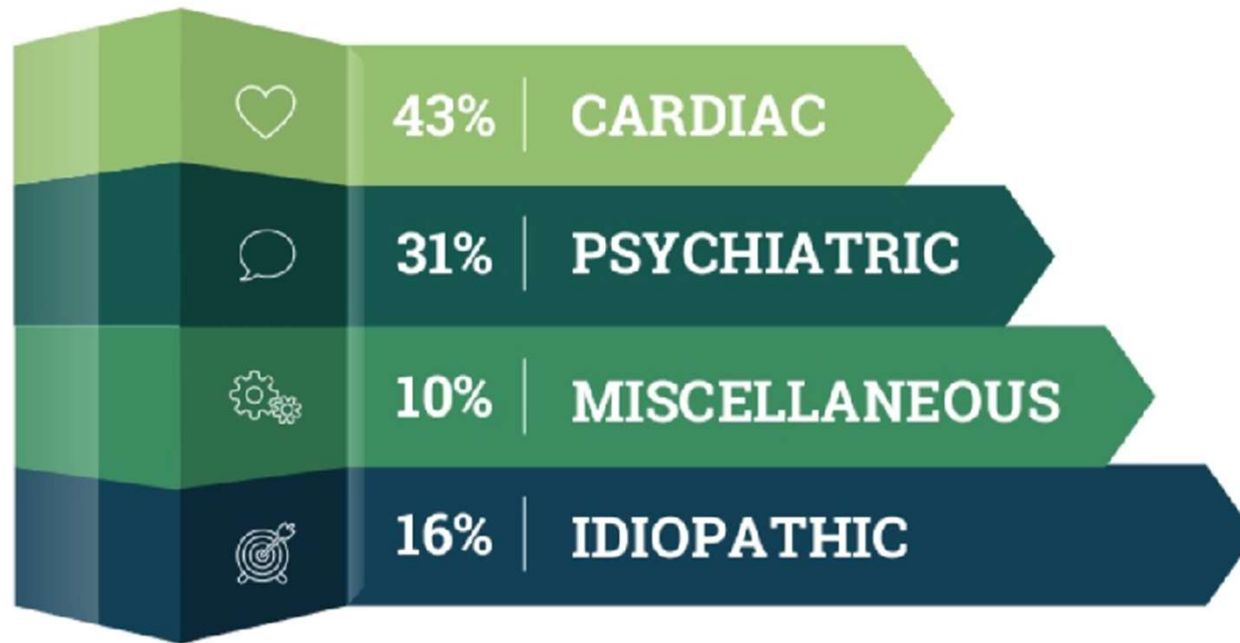
# INTRODUCTION

- 16% of OPD visits
  - Represents 5.8/1000 ER visits
  - Admission rate of 25%
- 3<sup>rd</sup> common complaint presenting to cardiologists
  - After chest pain and shortness of breath, and hypertension
- 43% are cardiac in nature
  - In a study of 190 people with chief complaint of palpitation

Weber BE, Kapoor WN. Evaluation and outcomes of patients with palpitations. Am J Med 1996;100(2):138–48.



# CAUSES OF PALPITATIONS



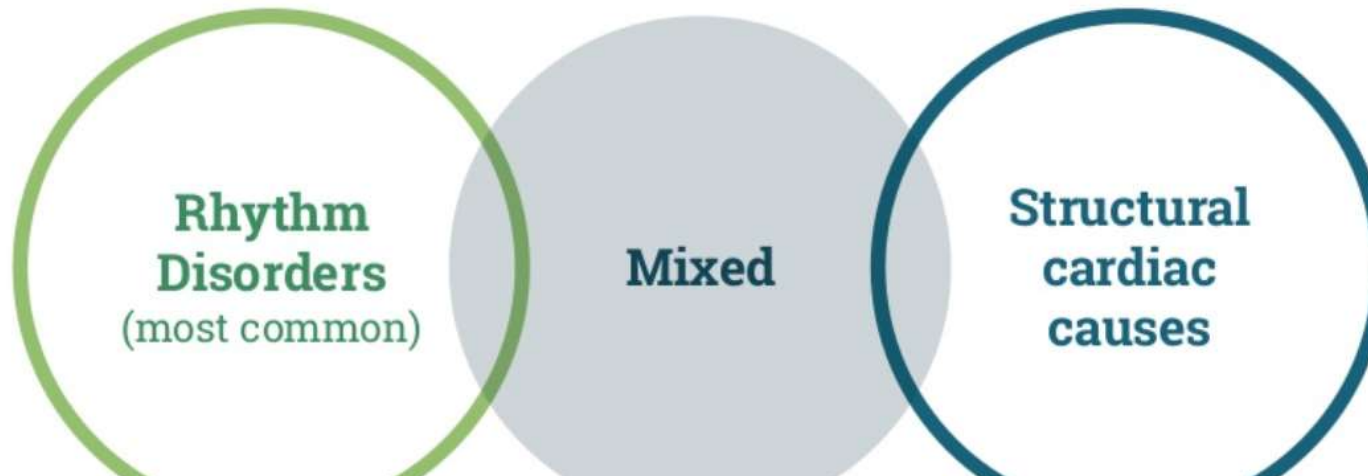
- Weber BE, Kapoor WN. Evaluation and outcomes of patients with palpitations. Am J Med 1996;100(2):138–48.

# PHYSIOLOGY

## Palpitation is due to

1. Alteration in heart rate e.g: sinus tachycardia & bradycardia
2. Alteration in heart rhythm (+/- rate) Eg: Atrial fibrillation
3. Alteration of subjective assessment, eg: anxiety states
4. Augmentation of myocardial contraction Eg: anxiety states & drugs
  - a. **Physiological Augmentation:** exercise, caffeine, tea, alcohol, aminophylline, ephedrine
  - b. **Pathological Augmentation:** ventricular hypertrophy from hypertension, valve disease, thyrotoxicosis, anaemia, fever, hypoglycemia.

## CARDIAC CAUSES (43 %)



# CARDIAC CAUSES

- **Independent Predictors of Cardiac Etiology of Palpitation**

- ✓ Male sex
- ✓ Description of an irregular heart beat
- ✓ History of heart disease
- ✓ Event duration >5 minutes
- ✓ 1 predictor : 26% 2 predictors: 48% 3 predictors: 71%

# CARDIAC CAUSES

## RHYTHM DISORDERS

- Premature contractions (PAC, PVC)
- Atrial fibrillation
- Atrial flutter
- Supraventricular tachycardia (SVT)
- Ventricular tachycardia (VT)
- Wolff-Parkinson-White syndrome (WPW)
- Ectopics (extrasystole)
- Sick sinus syndrome (SSS)
- Bradyarrhythmias (heart blocks)

## NON-ARRHYTHMIC CARDIAC CAUSES

- Systemic hypertension
- Mitral valve prolapse
- LVOT obstruction (aortic stenosis, HOCM)
- Aortic insufficiency
- RV dysfunction (PE, ASD, VSD)
- Myocarditis, Pericarditis
- Atrial myxoma

# PSYCHIATRIC CAUSES

- Panic attacks
- Anxiety states
- Somatization
- Depression
- Patients with psychiatric causes for palpitations more commonly report:
  - a longer duration of sensation >15min,
  - younger & disabled
  - multiplicity of symptoms than do patients with other causes
  - with more visits to ER .

# MISCELLANEOUS CAUSES

- Hyperkinetic circulatory states :
  - Anaemia , Fever , Thyrotoxicosis , Hypoglycemia , Pheochromocytoma
- Drugs :
  - Aminophylline , Atropine , Thyroxine , Tricyclic antidepressants , Vasodilators , Digitalis
- Others :
  - Caffeine , Cocaine , Amphetamines , Tobacco , Ethanol

# CAUSES(CONT.)

- Spontaneous skeletal muscle contractions of the chest wall
- Systemic mastocytosis
- Physiological : exertion , excitement , pregnancy
- Neurocirculatory asthenia or Da costa's syndrome or Effort syndrome or Soldier's heart
- Vaso-vagal attack

***Panic/Anxiety Disorder and Cardiac Arrhythmias are not mutually exclusive and could co-exist- ALWAYS complete a full cardiac evaluation***



# Case 1: after 1 month

- Syncopal attack x 1 episode which was the first in his life.
- Happened while he was at work
- Felt no palpitations before event
- No post ictal sleep

# Case 1 cont: What is(are) the most appropriate test at this time?

- 1) Adominal ultrasound
- 2) Chest Xray
- 3) Full blood count
- 4) Holter ECG
- 5) 12 lead ECG



# EVALUATION

Principal goal in assessing patients with palpitations is to **determine if the symptom is caused by a life-threatening arrhythmia**

- Remember:

**“All palpitations are not arrhythmias and many arrhythmias do not palpitate”**

# EVALUATION cont'd

## APPROACH



# HISTORY

- Character
- Mode of onset
- Mode of termination
- Precipitation
- Associated symptoms
- Relief with vagal maneuver
- Family History

# HISTORY (1)

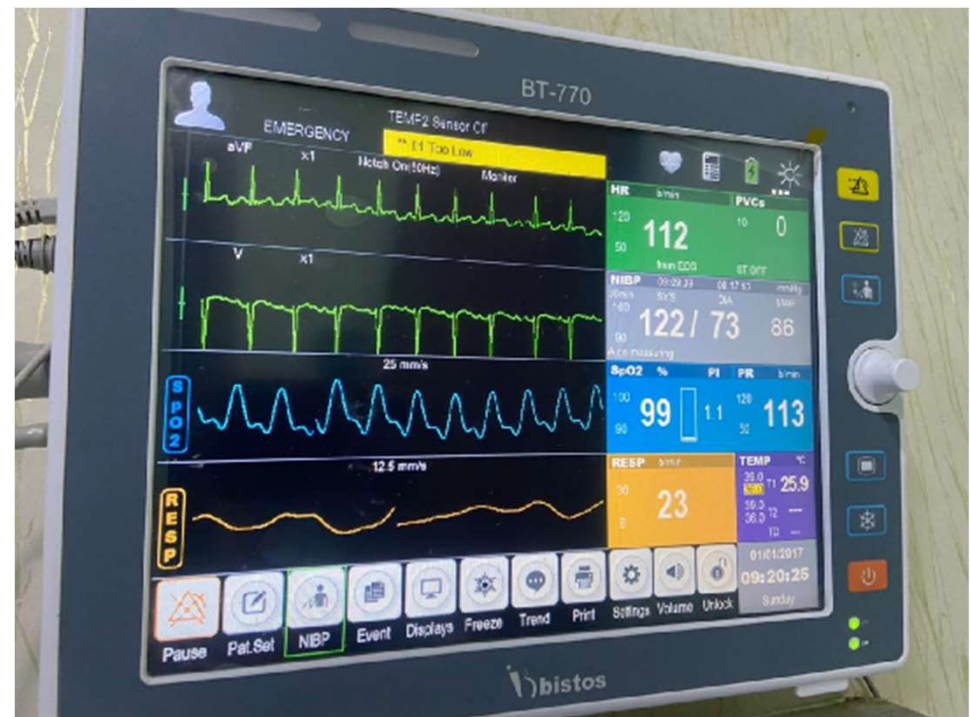
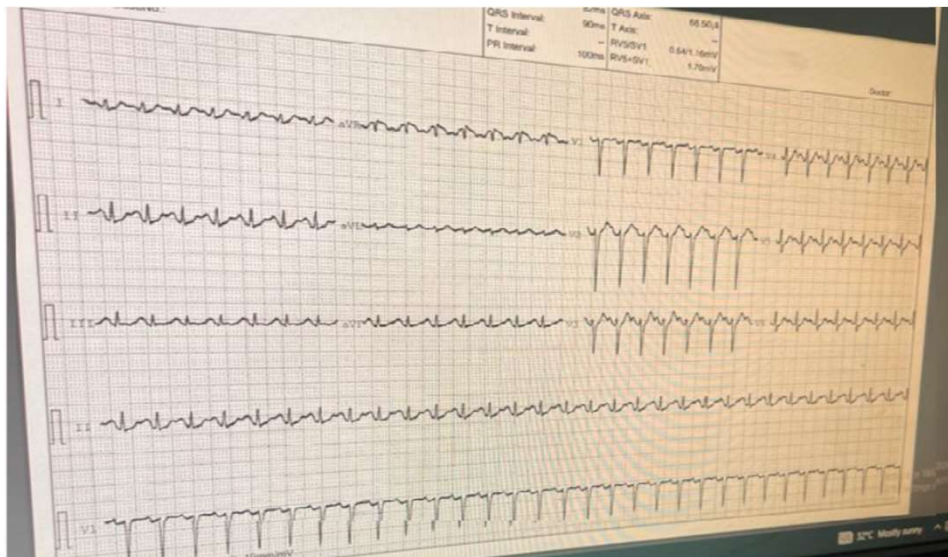
- Age of onset
- Is it true palpitation or some other symptom simulating it?
  - Chest discomfort or dyspnea can be confused for palpitation
- Physiologic
  - e.g. after running, sexual activity, etc
- More when alone and quiet with thoughts?
- Does it interrupt activities, wake from sleep? (AF, BENIGN ECTOPY)
- Any associated symptoms?
  - Lightheadedness, fainting, diaphoresis, dyspnoea, nausea, etc.

# HISTORY (2)

- Is it paroxysmal or persistent?
- If paroxysmal, what is mode of onset and offset?
- ✓ Abrupt onset +/- abrupt termination – usually an SVT, VT, or sick sinus syn.
- ✓ Gradual onset +/- gradual termination – usually other benign causes, sinus tachycardia
- Any relief with vagal maneuvers? – usually an SVT
- Does it worsen at night? – usually ectopic beats, AF



# after valsava manouvre



# HISTORY (3)

## CHARACTER

- Flip-flopping” (start & stop), missing a beat, thump in the heart – premature contractions i.e. PVC
- Rapid regular “racing” or “fluttering” in the chest – sinus tachycardia, SVT, VT
- Rapid irregular “fluttering” or “jumping about” – sustained VT , SVT – regular AVNRT, irregular- atrial fibrillation, tachycardia with variable block
- Pounding in the chest – hyperdynamic circulation

# HISTORY (4)

FEATURE	SUGGESTS
HEART MISSES AND THUMPS	ECTOPIC BEATS
WORSE AT REST	ECTOPIC BEATS
VERY FAST REGULAR	SVT / VT
SUDDEN ONSET	SVT / VT
OFFSET WITH VAGAL MANOEUVRES	SVT
FAST AND IRREGULAR	AF and ATRIAL FLUTTER with varying block
FORCEFUL AND REGULAR – NOT FAST	AWARENESS OF SINUS RHYTHM (ANXIETY)
SEVERE DIZZINESS OR SYNCOPE	VT or BRADYARRHYTHMIAS
PRE-EXISTING HEART FAILURE	VT

# HISTORY (5)

## RADIATION

- Does the palpitation radiate into the neck?
  - AV nodal tachycardias
  - Simultaneous contraction of both atria and ventricles cause reflux of blood into superior vena cava)
  - PVCs, CHB also cause atrio-ventricular dissociation,
    - resulting in pounding sensations in the neck and
    - often a finding of “cannon” A waves in JVP that occur when right atria contracts against a closed tricuspid valve

# HISTORY (6)

## ASSOCIATED SYMPTOMS

- **Syncope** – low C.O in arrhythmias (VT) or bradycardia, hypoglycemia
- **Dyspnea (before palpitation)** – acute MI or PE, valvular dysfunction
- **Dyspnea (after palpitation)** – heart failure due to arrhythmias (i.e. VT)
- **Chest pain (before palpitation)** – acute MI or PE
- **Chest pain (after palpitation)** – angina due to palpitation (i.e AS, MVP)

# HISTORY (7)

## ASSOCIATED SYMPTOMS

- **Polyuria** – atrial fib. / flutter, SVT (release of atrial natriuretic peptide)
- **Sweating** – acute MI, hypoglycemia, anxiety, thyrotoxicosis
- **Diarrhea** – hypokalemia, thyrotoxicosis
- **Melena, heavy menstrual bleeding** – anemia
- **Heat intolerance, weight loss, increased appetite** – thyrotoxicosis

# PAST HISTORY

- **Any known heart disease?** - IHD, RHD, valvular disorders, cardiomyopathy, heart failure
- **Any other known conditions?** - Pregnancy, fever, anemia, hyperthyroidism, asthma
- **Any recent drug intake, caffeine and alcohol consumption?** - Sympathomimetics i.e beta agonists used by asthmatics
- **Family history of sudden cardiac death?** - Palpitations is a symptom of many common conditions



# EXAMINATION-VITALS

- **Bradycardia** – Vasovagal syncope, heart blocks
- **Tachycardia** – MAT, SVT, VT, AVNT, atrial flutter, anxiety, MI, PE
- **Hypotension** – Vasovagal syncope, SVT, VT
- **Bounding pulse** – SVT, anemia, dehydration, hypoglycemia
- **Irregular pulse** – atrial fibrillation, ectopic “skip beats” (PVC)
- **Pyrexia** – thyrotoxicosis, infections, rheumatic fever, PE.



# EXAMINATION

- Pallor – Anemia
- Goitre, exophthalmos, fine tremors – Thyrotoxicosis
- Raised JVP – SVT, AVNT, PVC, atrial flutter, PE
- Murmurs – valvular disorders
- Other: S3 gallop (HF), S4 (LVH), loud P2 (PE), bibasal fine rales (HF), bipedal edema (HF), calf tenderness (PE)

# INVESTIGATIONS

- 12 Lead Resting ECG –
- Ambulatory (Holter) ECG- 24-96hrs
- Blood sugar profile
- Serum electrolytes esp Ca, Mg, PO4
- CBC
- Screening Thyroid Function Tests

# INVESTIGATIONS (2)

- Thyroid function tests -Thyrotoxicosis
- Cardiac biomarkers – Suspected MI
- D-dimer – suspected PE
- Echocardiography- structural heart disease
- Treadmill exercise testing for palpitations precipitated by exercise

# INVESTIGATION- ECG

## Sinus rhythm ECG markers of arrhythmia<sup>1</sup>

Electrocardiographic sign	Implication/consideration
Pre-excitation/delta wave	WPW – AVRT
Left atrial enlargement, frequent PACs, sinus bradycardia	Atrial fibrillation
Left ventricular hypertrophy	Atrial fibrillation, ventricular tachycardia
Frequent PVCs	Ventricular tachycardia
Q waves	Ischaemic heart disease – atrial fibrillation, ventricular tachycardia
Widespread T wave inversion across precordial leads, LVH, Q waves and ST-segment changes	Hypertrophic cardiomyopathy – risk of atrial fibrillation, ventricular tachycardia
Long or short QT interval, Brugada pattern, early repolarisation pattern	Genetic arrhythmia syndromes – risk of sudden cardiac death
Inverted T waves or Epsilon waves across right precordial leads (V1–V3)*	ARVC – risk of sudden cardiac death

# INVESTIGATION- ECG

**Table 2. Ambulatory ECG monitoring: Choice of investigation**

Investigation	Investigation of choice: symptom frequency	Advantages	Disadvantages
12-lead ECG	-	Readily available Inexpensive	Rarely performed during arrhythmia
24-48 hour Holter monitor	Daily to every second day	Usually available Does not require activation: asymptomatic arrhythmia can be detected	Low yield other than for daily arrhythmias
Loop/event recorder (range of 1-4 weeks) Loop/event recorder for one week	Weekly-monthly	Increased yield and cost effectiveness (versus Holter)	Most units only record ECG if patient triggered; not useful for asymptomatic arrhythmia or syncope Generally only one-week recorders available Patient discomfort for longer-term monitoring
Implantable loop recorder	Months to year/s	High yield Long-term monitoring approximately three years Automatic bradycardia/ tachycardia storage plus patient-triggered episodes	Cost Not available in all centres Currently only approved for diagnosis of syncope or cryptogenic stroke
Handheld ECG	Months to year	High yield Permanently available to patient	Cost to patient Time for activation of device before arrhythmia termination

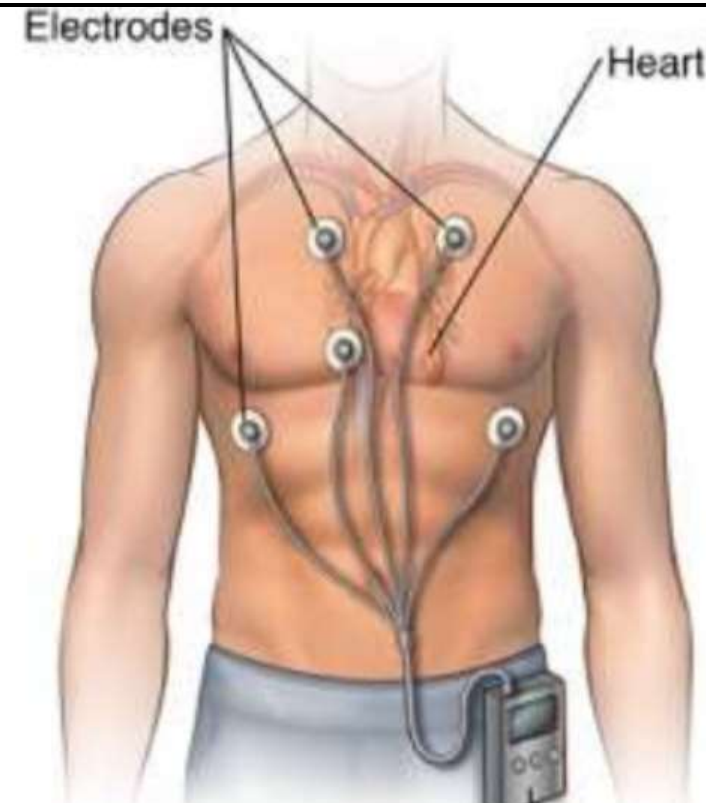


# Holter result

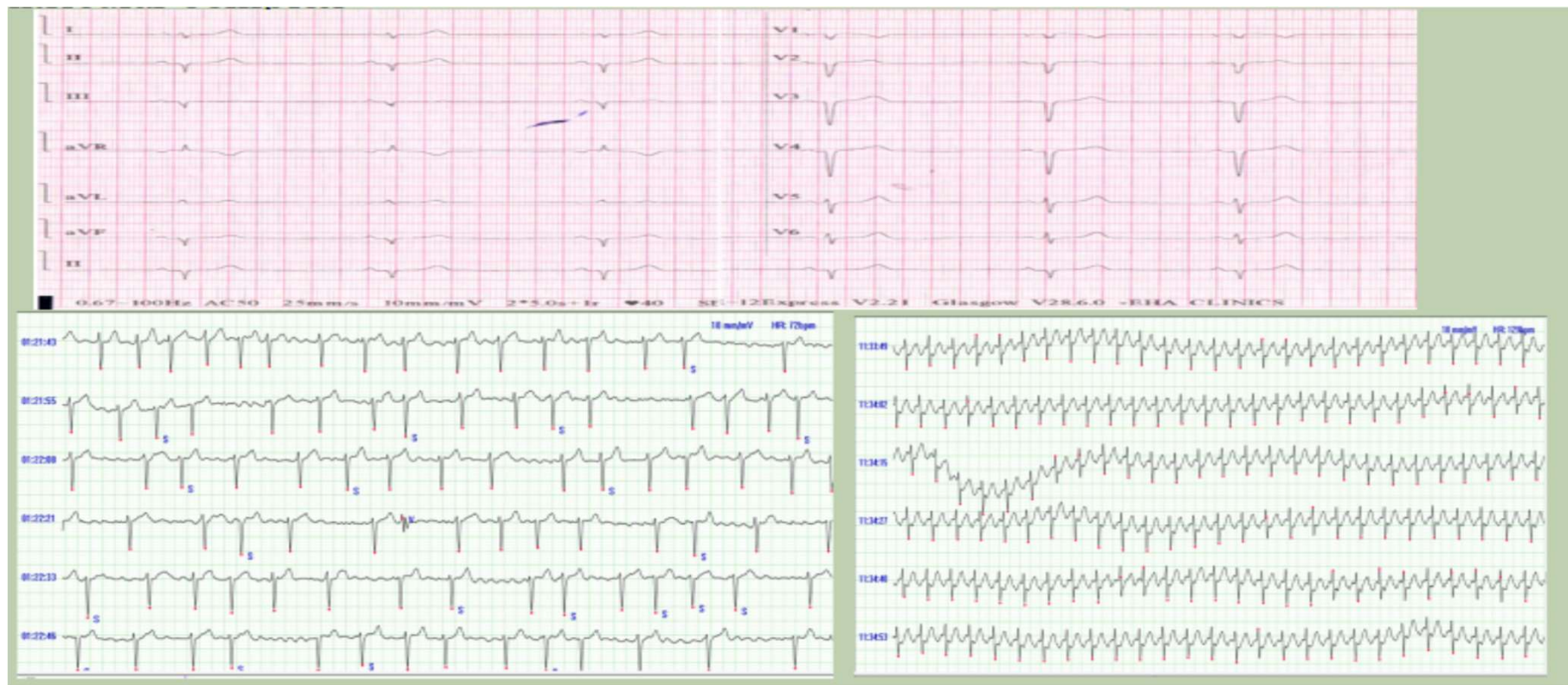


## HOLTER MONITORING

- Helpful, if palpitation is **paroxysmal** and occurs on a regular basis
- Electrodes with a monitoring device are attached to the patient for a **1 to 14 days**
- Patient is asked to continue and record his activities in a diary
- Rhythm strips are then analyzed

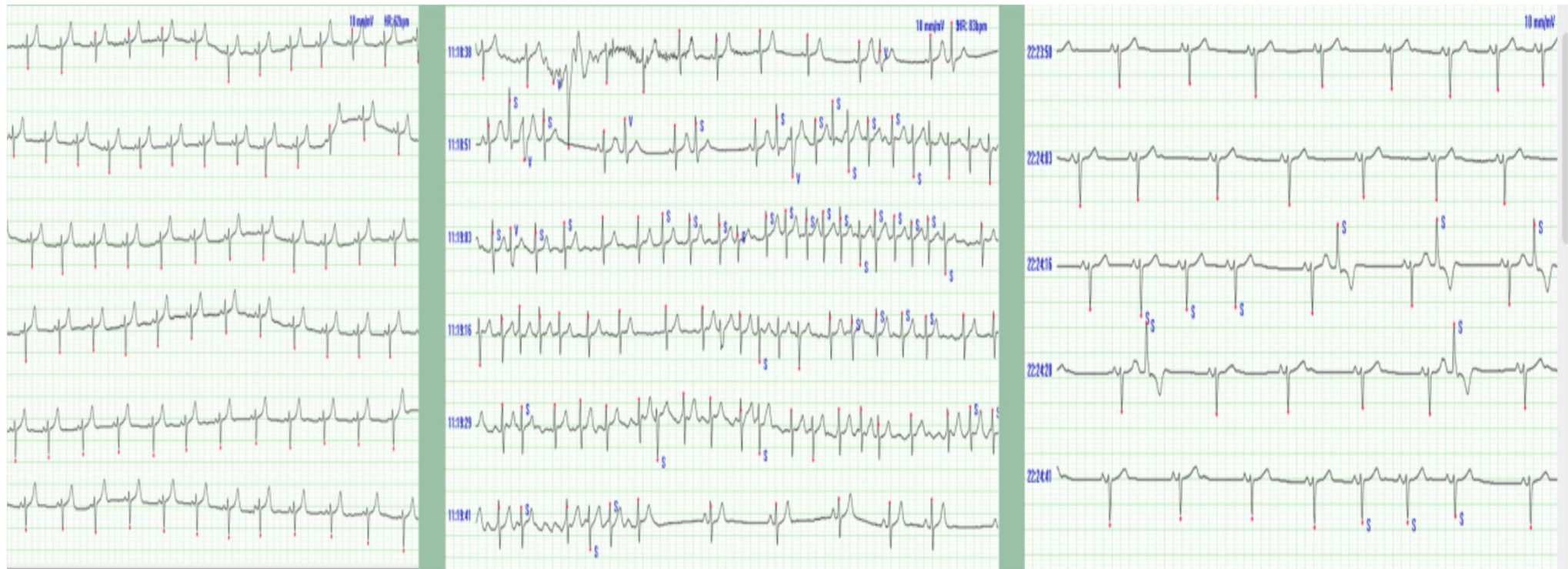


# HOLTER ECG





# HOLTER ECG





# External and implantable loop recorder



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45x7x4mm



62x19x8mm



56x19x8mm

# Implantable loop recorder



- ILR is a small device that is implanted under the chest skin.
- Helpful if palpitations are paroxysmal but not very regular to be captured by Holter.
- It records and stores heart activity as ECG and has battery life over several years.
- Patients are instructed to activate the recorder whenever palpitations are felt and visit the physician.



# SUMMARY

History, examination, ECG

Echocardiogram if cardiovascular symptoms/risk factors  
Holter monitor for frequent palpitations

Diagnosis confirmed, structurally  
normal heart, normal ECG

Unexplained palpitations

Yes

No

Structural heart  
disease/abnormal  
ECG

Structurally normal  
heart/ECG

Manage as appropriate,  
consider referral if sustained  
palpitations or warning  
signs\*

Consider cardiology/EP  
referral

Cardiology/EP  
referral

Cardiology/EP  
referral if frequent  
and distressing

No further  
management if  
infrequent and not  
distressing

# CARDIOCARE PALPITATION ALGORITHM

## PATIENT WITH PALPITATIONS

**1. Take History, Perform Physical Examination and Get a 12-lead ECG**

**2. Full Blood Count, Chemistry, TSH, Screen for drugs where appropriate**

**3. Echocardiography and/or Holter ECG (if structural disease is suspected)**

**4a.**  
Extracardiac  
Cause  
Diagnosed

**4b. Structural Disease confirmed or suspected  
(Refer to Cardiocare Hospital or other Cardiologist)**

**5a. Holter Monitoring  
If Daily Palpitations**

**5b. Event Monitoring for 2 weeks  
If Palpitations are less than Daily**

**6a. Treat**  
anxiety,  
thyroid issues,  
drug use, etc

**6b. Palpitations  
during Normal  
Sinus Rhythm**

**6c. Premature Ventricular Contractions**

Lown's Grade 1-2

Lown's Grade 3-5

**6d. Non-Ventricular  
Arrhythmia**

**6e. Ventricular  
Arrhythmia**

**7a. Reassure** except structural disease is  
present that indicates treatment

**7b. Treat**

**8. Consider Device therapy (Pacemaker, ICDs or CRTs) if criteria is reached and sudden death risk is significant e.g. Heart failure, HCM- Refer to Cardiocare for Device Implantation, Programming or Evaluation**

# Referral. Who?

- Patients with frequent or persistent arrhythmia
- Significant associated symptoms: Presyncope/syncope, breathlessness, chest pain.
- Family hx of recurrent syncope or of sudden death
- Significant ECG or Echo abnormalities:
  - Short PR interval or delta wave, T wave abnormalities, Q waves, long QT interval, short QT interval, Brugada pattern, repolarization changes etc

# MANAGEMENT

- Re-assurance- after excluding fatal causes
- Lifestyle modification
- Correction of co-morbid diseases
- Anxiolytics and Beta-blockers
- Anti-arrhythmic drugs / electrical conversion
- Psychiatric causes of palpitations may benefit from cognitive or pharmacotherapies



# REFERENCES

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- Knudson MP. The natural history of palpitations in a family practice. J Fam Pract 1987;24:357–60.
- Zimetbaum P, Josephson ME. Evaluation of patients with palpitations. New Engl J Med 1998;338:1369–73.



# How can you Partner and Refer?

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**080 90 160 190**

[frontdesk@cardiocare.ng](mailto:frontdesk@cardiocare.ng)





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- Thank you for  
your time