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## **I. ECG (Electrocardiogram)**

ECG is the simplest and the easily available tests that a heart patient can look for. This is an electrical recording of the heart. ECG reflects the proper functioning of the heart muscles and their condition as a function of the blood supply and oxygen received by them.

A single ECG curve has five main components - p, q, r, s, t. The space between s and t, called the ST segment can indicate angina, during the recording of the heart beating. ST segment lowering (medical term depression) is taken as a sure sign of angina. T wave inversion is also a sign of Angina.

One must realize a doctor has to get a training of more than five years to analyze the ECG, even then it may be difficult for him to know everything about ECG. It is advisable that a final decision should be taken only after the ECG is seen by a qualified doctor.

ECG is a simple and convenient investigation which can be done at the bed side to observe angina.

Breathlessness is felt, if ECG changes appear early in the TMT, then the coronary heart disease is severe, and if the changes appear later they are not so severe

## **2. Echocardiogram**

Echocardiography is a unique noninvasive method for imaging the living heart. It is based on detection of echoes produced by a beam of ultrasound (very high frequency sound) pulses transmitted into the heart

An echocardiogram is a test in which ultrasound is used to examine the heart.

In addition to providing single-dimension images, known as M-mode echo that allows accurate measurement of the heart chambers, the echocardiogram also offers far more sophisticated and advanced imaging. This is known as two-dimensional (2-D) Echo and is capable of displaying a cross-sectional "slice" of the beating heart, including the chambers, valves and the major blood vessels that exit from the left and right ventricle

An echocardiogram can be obtained in a physician's office or in the hospital. For a resting echocardiogram no special preparation is necessary. Clothing from the upper body is removed and covered by a gown or sheet to keep you comfortable and maintain the privacy of females. The patient then lies on an examination table or a hospital bed

A colorless gel is then applied to the chest and the echo transducer is placed on top of it. The echo technologist then makes recordings from different parts of the chest to obtain several views of the heart. You may be asked to move from your back and to the side. Instructions may also be given for you to breathe slowly or to hold your breath. This helps in obtaining higher quality pictures. The images are constantly viewed on the monitor. It is also recorded on photographic paper and on videotape. The tape offers a permanent record of the examination and is reviewed by the physician prior to completion of the final report.

Simultaneous ECG Protocol:

Sometimes Simultaneously ECG is also taken. Sticky patches or electrodes are attached to the chest and shoulders and connected to electrodes or wires. These help to record the electrocardiogram (EKG or ECG) during the echocardiography test. The EKG helps in the timing of various cardiac events (filling and emptying of chambers).

### 3. TMT or Stress Test

It is common to find heart patients who have normal ECG. One must remember that the ECGs are taken at rest when the heart is beating at its lowest rate. Even with 90% blocks the patients can have a normal ECG. In such cases the patient would also agree that at rest there is no pain in the chest, the angina symptoms would only come when they increase the heart rate, while doing some physical exertion like walking.

This is the condition where we need a TMT test. The patients are to gradually increase their heart rate, thus increasing the blood requirement of the heart muscles. Simultaneously ECG records are taken. If there is a blockage of approximately more than 70% ECG shows changes, suggestive of Angina.

Patients have to physically exert for this test which uses a computerised machine. The level of the exercise is gradually increased according to a standard protocol called the Bruce's Protocol. The continuous ECG monitoring during the exercise would reflect any blood and oxygen deficit in the muscles of the heart during exercise. The patient is asked to stop exercising as soon as ECG changes appear or any symptoms of chest pain or discomfort or breathlessness are felt.

TMT test is also called Exercise Stress Test, Computerised Stress Test or simply Stress test. This is the most easy, popular and common test performed on heart patients to determine the severity of the heart disease. Taken at an interval, this test can also show the improvement or deterioration of patient's angina.

A negative TMT or Stress Test is declared when the patient can reach a certain heart rate without showing any ECG changes. This rate is called a target heart rate and is calculated by a formula (**Target Heart Rate = 220 – age of patient**). If this rate is reached by the patient without producing any ECG changes, though the TMT can be called negative, but it would not mean that the blockage is zero. It will only mean that the person performing the test probably has a blockage less than 70%

#### **4. Angiography**

In Angiography, a long wire called catheter is inserted inside the artery of the leg, near the thigh crease. This catheter is then pushed against the blood flow towards the heart blindly. With a view of the tip of the catheter on the fluoroscopy monitor (which exposes the patient to very heavy radiation) this catheter is pushed onwards by trial and error method. If it gets stuck somewhere on the route, it is withdrawn a little and again pushed in. Once the tip reaches the heart area, further manipulation is done to push the tip in one of the coronary arteries. Once inside the coronary tube, after a lot of trial and error, a radioactive dye is injected through the hole in the catheter inside the coronary tubes and further fluoroscopy photographs are taken.

The tip of the catheter is again withdrawn, negotiated inside another coronary tube and the same photos are taken.

If the dye seems to fill up the coronary tubes completely, the blockages are probably not there. If the dye cannot fill the tubes (as roughly seen in the photos taken) inside, it is taken as filling defect and indirectly interpreted as blockages. The viewer mostly puts a rough percentage.

This report, being an eye estimation is given as 70%, 80% and so on. It varies from one viewer to another. It also depends on the timing of the photograph (best is before the dye is washed out), angle of the photograph etc. and is thus amenable to lot of different reports. It is not at all accurate and thus given in variations of 10%.

#### **Accuracy of Angiography**

The blocks are reported in Angiography and they jump by 10% each time! This only shows how rough estimates are generalised and made a round figure. Ten to twenty percent variations are also there depending on the individual bias or variability of the cardiologist concerned.

#### **Complications of Angiography**

1. Death
2. Myocardial Infarction

Factors predisposing

Unstable Angina

Angina at Rest

Recent Sub-endocardial MI.

Insulin Dependent Diabetes Mellitus

3. Neurological

Transient Persistent (Stroke)

A-V fistulae

Haematomas with Vascular and neural compression

Delayed Haemorrhage

4. Local, Brachial and Femoral Complications

a. Brachial

Arterial Thrombosis

Median N. Injury

Late Arterial bleed

Bacterial arteritis

Local Cellulitis, Phlebitis

b. Femoral

Arterial or venous thrombosis

Distal Embolization

False aneurysm

5. Perforation of the Heart or Great vessels

6. Vaso-Vagal Reactions

7. Arrhythmias and Conduction Disturbances

8. Phlebitis, infection, fever

9. Pyrogen Reaction

10. Hypotension

11. Allergic Shock

Hypotension/Anaphylaxis

12. Other Complications

Pulmonary Oedema

Pulmonary artery perforation

& Pulmonary Hemorrhage

Coronary Artery Dissection

Cholesterol Embolization  
Systemic or Pulmonary Embolization of Vegetations  
Pulmonary Embolism  
Catheter Entanglement

**Drawbacks**

1. High costs and risks involved.
2. Invasive procedure

## **5. Pet scan**

PET Scan is the latest non-invasive investigation to ascertain coronary artery disease progress or the reversal of blockages. This investigation is used to show that reversal in the blockages of the coronary arteries of the patients. This extremely expensive and sophisticated investigation is available in a few centres only of the world. The patient is made to lie down on a table which is introduced into the scanner and sectional pictures are taken of the heart. A coloured graphical representation of the blood flow throughout the heart can also be obtained giving an accurate idea of the blockages present.

The PET Scan Machine costs around Rs.15 crores and is therefore a very costly investigation.



## **6. About US**

**MDIndia Healthcare Services (TPA) Pvt. Ltd.** was founded in November 2000, with exclusive focus on healthcare insurance and aim of providing TPA (Third Party Administration) services to Indian Health Insurance Sector. IRDA (Insurance Regulatory and Development Authority), the regulatory body that governs and licenses all players in the insurance industry, issued the TPA License (No. 005) to MDIndia in March 2001.

The company currently provides service to more than 6 million members using **State of the Art technology**. We believe that technology is critical and essential to provide a very high quality service to our members and clients and we have made significant investments in the hardware, software and various tools to ensure uninterrupted and efficient 24 by 7 services. Our in-house technology and software team has more than 100 years of combined experience to develop and maintain our systems, software and services. The advanced technology has helped MDIndia to improve on the Turn Around Time, provide uninterrupted service and boost efficiency to provide a customer experience that has been exceptionally appreciated by our clients.

MDIndia has been financially stable since inception and is providing services to all the leading insurers in India from Public sector as well Private Sector.

### **MDINDIA SALIENT FEATURES:**

- ✓ *The only thoroughbred TPA spread over 100,000 sq ft ( HO & branches)*
- ✓ *Tela Outsourcing Inc located at Pune, a member organization of the group and processes claims for 31 US health insurance companies*
- ✓ *Expertise in handling multiple international claim software and adopting the most suitable feature*
- ✓ *46 offices across India all on our own MPLS VPN connectivity. To be present in 63 office locations by March 2011.*
- ✓ *Over 100 locations with resident representatives to assist the customers of our esteemed clientele*
- ✓ *221 Medical personnel employed on date to be enhanced to 237 by Dec 2010*
- ✓ *Auto adjudication and auto authorization software under trial*
- ✓ *The only TPA to have claimed Performance Incentive across all insurance companies.*

- ✓ **Auto Email , Auto SMS updates to the insured, agents, hospitals and insurers as per requirements**
- ✓ **Reminder SMS and Emails sent to the prospective clients to remind them about the planned examination and diagnostic tests at our network centers.**
- ✓ **Auto MIS generated by software**
- ✓ **The only TPA to invest in Universal Access Number**
- ✓ **State of the art, 24 x 7, 24 seater multilingual call centre**

## **SERVICES OFFERED BY MDINDIA.**

MDIndia offers the "Third Party Administration" Services to its clients i.e. Insurance Companies, Policyholders, Corporates, Government and Healthcare Providers through following service verticals

### **Business Verticals**



### **Legend:**

- **GBS: Government Business Solutions (RSBY, Tsunami, Micro Insurances)**
- **EBAS: Employee Benefit Administration Services ( Corporate/Group Policies)**
- **RBAS: Retail Benefit Administration Services**
- **PNS: Provider Network Services**
- **IFD: Investigation & Fraud Detection**
- **PIMS: Pre Insurance Medical Services**

## **7. Contact us**

**For Health Checkups (Pre Employment, Annual or Pre Policy )**

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