

Short Notes  
Of  
General medicine

BY THE STUDENTS FOR THE STUDENTS

BioMed

Editor & Publisher

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## 1. Modified Jone's criteria for Rheumatic fever

### Major Criteria

1. Arthritis:
  - a. Polyarthrititis
  - b. Migratory
  - c. Major joint : Elbow, Shoulder, Hip, Knee
  - d. No permanent joint deformity.
2. Carditis:
  - a. Pancarditis = Endocarditis + Myocarditis + Pericarditis
  - b. Permanent cardiac deformities : Fibrosis and calcification valvular disease
3. Chorea:
  - a. Basal ganglia involvement
  - b. Fine movements affected
  - c. Deterioration of handwriting
  - d. Emotional lability
  - e. Grimacing of face
  - f. Clinical signs- Pronator sign, Jack in the box sign , Milking sign of hands
4. Erythema marginatum :
  - a. non-pruritic,
  - b. flat
  - c. Transient
  - d. Circular & Serpiginous
  - e. Pale center with red irregular margin
  - f. More on trunks & limbs & non-itchy
  - g. On the trunk & thighs.
5. Subcutaneous nodules:
  - a. Colour less
  - b. Painless
  - c. Palpable nodules
  - d. Peanut size = nodules 1-2 cm
  - e. Mainly over extensor surfaces of joints,spine,scapulae & scalp
  - f. Associated with strong seropositivity.

### Minor Criteria:

- Fever
- Arthralgia
- Pallor
- Anorexia
- Loss of weight
- High ESR
- Anemia
- Leucocytosis
- Elevated C-reactive protien
- ASO titre >200 Todd units.
- Anti-DNAse B test
- Throat culture-GABHstreptococci

### Diagnostic Requirement :

- Two major criteria
- One major and Two minor criteria,
  - indicates a high probability of acute rheumatic fever, if supported by evidence of Group A streptococcal infection.

## 2. Urinary Examination

Physical examination				
1	Volume	Normal	1200 - 1500 ml	
		Increase	Polyuria	Diabetis mellitus Diabetis insipidus Diuretic phase of CRF
		Decrease	Anuria (<100 ml/day)	ARF CRF Glomerulonephritis
			Oliguria (<400 ml/day)	Same as above
2	Colour	Normal	colourless ( light yellow to amber )	
		Pathological	Dark yellow	Jaundice
			Black	Alkaptonuria
			Red	Porphyria Renal stone Renal carcinoma Drug induce : Rifampicin
3	Odour	Normal	Aromatic	
		Pathological	Fruity	Diabetic Ketoacidosis
			Ammonical	Store urine
4	Specific gravity	Normal	1.005 - 1.035	
		Increase		Dehydration -Diarrhoea, Vomiting
		Decrease		Diabetes insipidous Excessive water intake CRF
5	Appearance	Normal	Clear	Transparent
		Pathological	Turbid	Urinary infection Cast cell - Stone
6	pH	Normal	4.6 - 8.0	
		Acidic		Heavy protein diet
		Alkaline		Bacterial infection
Chemical Analysis				
7	Protein	Normal	Absent	
		Pathological	Present	Nephrotic syndrome Glomerularenephritis Diabetic nephropathy
8	Glucose	Normal	Absent	
		Pathological	Present	Diabetes Mellitus Renal tubular damage
9	Ketone body	Normal	Absent	
		Pathological	Present	Diabetes ketoacidosis Starvation

				Renal tubular damage
10	Blood	Normal	Absent	
		Pathological	Present	Renal stone Renal carcinoma
11	Bile Pigment	Normal	Trace present	
		Pathologically	High	Obstructive jaundice
12	Urobilinogen	Normal	Trace present	
		Pathologically	High	Haemolytic jaundice
Microscopic examination				
13	RBC		Present / High/ Very high	Renal stone Uretric stone Renal carcinoma
14	WBC		Present / High/ Very high	Pyelonephritis Urinary tract infection
15	Pus cell		Present / High/ Very high	Pyelonephritis Urinary tract infection
16	Cast & Crystall		Present / High/ Very high	Crystalline stone in Renal or ureter.

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### 3. Antihypertensive drugs

#### Group of Antihypertensive

1. Centrally acting drug = alpha2 receptor agonist:
  - a. Clonidine, Methyldopa
2. Adrenergic neuron blocker
  - a. Reserpine
3. Adrenergic receptor blocker
  - a. Alpha blocker
    - i. Prazosin
  - b. Beta blocker
    - i. Propranolol
    - ii. Atenolol
  - c. Mixed alpha and beta blocker
    - i. Labetalol
    - ii. Carvedilol
4. Arteriolar dilator
  - a. Hydralazine, Minoxidil, Diazoxide
5. Arteriolar and venular dilator
  - a. Sodium nitroprusside
6. Calcium Channel blocker
  - a. Verapamil, Nifedipine
7. Diuretic
  - a. Thiazide diuretic
    - i. Hydrochlorothiazide
    - ii. Chlorthalidone
  - b. Loop diuretic
    - i. Furosemide
  - c. Potassium Sparing diuretic
    - i. Spironolactone, Triamterene
8. Angiotensinogen Converting Enzyme inhibitor
  - a. Captopril, Enalapril, Lisinopril, Ramipril
9. Angiotensin II receptor antagonist
  - a. Losartan, Telmisartan
10. Renin inhibitor
  - a. Aliskiren

#### Adverse effect of Antihypertensive drugs

##### Thiazides :

- Hypokalemia
- Hyperlipidemia
- Hyperuricemia
- Hyponatremia .

##### ACE inhibitor :

- Dry cough due to increase bradykinin levels
- Skin rashes

**Losartan :**

- Hyperkalemia
- Contraindication - pregnancy and lactation

**Methyl dopa :**

- postural hypotension

**Beta Blocker :**

- Bradycardia
- Postural hypotension
- 1<sup>st</sup> degree heart block
- Bronchial asthma

**Nifedipine :**

- Reflex tachycardia

**Indication & Contraindication :**

Drug group	Indication	Contraindication
Ca channel blockers	- Systolic hypertension	- Heart failure
Angiotensin Receptor Blocker	- LV failure - Previous MI - Diabetic nephropathy - Proteinuria	- Pregnancy - Hyperkalemia - Renal artery stenosis
ACE inhibitors	- LV failure - Previous MI - Diabetic nephropathy - Proteinuria	- Pregnancy - Angioneurotic edema - Hyperkalemia - Renal artery stenosis
Diuretics	- Congestive cardiac failure	- Gout - Hypokalemia
β-Blockers	- Angina - Previous MI	- Asthma - COPD - Diabetes mellitus - Bradycardia - Peripheral artery disease

## 4. Trigger factor of Bronchial asthma & it's diagnosis

### Trigger factors:-

1. Occupation
  - Due to inhalation of a specific agent at the work place.
  - E.g. chemical ,wooden dust ,dust, cotton
2. Exercise : especially running
3. Cold air, fog
4. Infection : Cold , flu, bacterial , Viral respiratory tract infection
5. Allergens : House dust, pollen, pet dander
6. Non specific irritants : cigarette smoke , perfumes, paints
7. Drugs : Beta blockers, aspirin ,NSAIDs
8. Emotional stress & Anxiety
9. Atmospheric - ozone, sulphur dioxide
10. Acid reflux

### Diagnosis :-

- 1 Mainly from **history** diagnosis of asthma is done
- 2 **Complete Blood count –**
  - a. **Allergic condition** – Eosinophilia increases
  - b. **Infective** – Neutrophil / Lymphocyte increases
- 3 **Chest radiograph**
  - a. In 75% of case, it is normal
  - b. Hyperinflation & bronchial thickening
- 4 **Skin tests –**
  - a. to confirm allergen
- 5 **Spirometry & Peak flow rate**
- 6 **Provocation (challenge) tests**
  - a. exercise challenge tests useful in young adults
  - b. used to confirm diagnosis of asthma
  - c. Fall in FEV1 (Force Expiratory Volume in 1 second) or PEF (Peak Expiratory Flow Rate) occurs after 5 -7 minutes of vigorous exercise in most patients with asthma.
- 7 **Elevation of total serum IgE**
- 8 **Sputum examination**
  - a. To confirm and differentiate infective pathology
- 9 **Arterial Blood gas analysis**
- 10 **Capnography**
- 11 **Pulse oximetry .**



## 5. Arterial Blood Gas analysis

	Parameter in ABG	Physiological	Pathological
1	pH	7.35 to 7.45	< 7.35 = Acidosis >7.45 = Alkalosis
2	pO <sub>2</sub>	95 – 100 mmHg	< 80% = Hypoxia
3	pCO <sub>2</sub>	32 – 44 mmHg	< 32= Respiratory alkalosis > 44 = Respiratory acidosis
4	HCO <sub>3</sub> <sup>-</sup>	22 – 26 mmol/L	< 22 = Metabolic acidosis > 26 = Metabolic alkalosis
5	Base excess	-2.0 to + 2.0 mmol/l	
6	SpO <sub>2</sub>	90 – 100 %	

### METHOD of Sample collection:-

- Arterial samples is collected from Radial or Femoral artery.
- Collected in Heparin containing vial
- And transported immediately to laboratory.
- Avoid expose to atmospheric air

### Use of ABG :-

- a) detection of hypoxemia and hypercapnia
- b) management of respiratory failure
- c) care of the ventilated patient
- d) detection of abnormalities of acid – base balance

### Interpretation :

		pH (7.35 – 7.45)	pO <sub>2</sub> (95 - 100)	pCO <sub>2</sub> (32 - 44)	HCO <sub>3</sub> <sup>-</sup> (22 - 26)
Metabolic acidosis	Uncompensated	Low	Normal	Normal	Low
	Partially compensated	Low	Normal	Low	Low
	Fully compensated	7.35	Normal	Low	Low
Metabolic Alkalosis	Uncompensated	High	Normal	Normal	High
	Partially compensated	High	Normal	High	High
	Fully compensated	7.45	Normal	High	High
Respiratory acidosis	Uncompensated	Low	Normal/ Low	High	Normal
	Partially compensated	Low	Normal/Low	High	High
	Fully compensated	7.35	Normal/Low	High	High
Respiratory Alkalosis	Uncompensated	High	High / Normal /Low	Low	Normal
	Partially compensated	High	High / Normal /Low	Low	Low
	Fully compensated	7.45	High / Normal /Low	Low	Low

## 6. Central venous pressure (CVP)

It is also called as right atrial pressure .

### It is indicator of

- the pressure of blood in the thoracic vena cava
- the pressure of the right atrium of the heart.
- amount of blood returning to the heart
- congestion of blood into arterial system.
- Parenteral fluid management.

Normal value = 5 to 10cm H<sub>2</sub>O

### FACTORS:-

#### Increasing CVP

- Hypervolemia (Hyperdynamic condition = increase blood flow)
- Pregnancy
- Hyperthyroidism
- Decrease cardiac output (Congestive cardiac failure)
- Mitral stenosis
- Aortic stenosis
- Pulmonary hypertension
- Pulmonary embolism
- Pneumothorax
- Venous contraction
- Changing from standing to supine body posture
- Forced exhalation
- Mechanical ventilation & application of PEEP ( Positive End Expiratory Pressure)

#### Decreasing CVP

- Hypovolemia , Shock
- Diarrhea, Severe Blood Loss – Polytrauma
- Deep inhalation

### Method of Measurement

Manual manometer

Electronic transducer

- Canula is inserted from subclavian vein or external jugular vein
- Sensor of the canula has been kept at level of 4<sup>th</sup> intercostal space in mid axillary line while patient is supine in jugular vein.

### Complication of Procedure

- Pneumothorax due to accidental rupture of pleura.
- Rupture of major vein may lead to haematoma.

## 7. Glycated hemoglobin (HbA1C)

### **Defination :**

It is a form of hemoglobin that is non enzymatically attached with glucose molecule only.

When blood glucose levels are high, more glucose molecules attach to the hemoglobin in red blood cells. So The longer hyperglycemia makes more glucose binding to hemoglobins and higher the glycated hemoglobin.

So HbA1C indicate the average plasma glucose concentration of approximately 120 days, which is life span of RBC.

### **Normal level**

- HbA1C = 4.5 - 7%

### **Use :**

- Diagnosis of diabetes mellitus (If HbA1C >7)
- Prognosis of diabetes mellitus patient
- Glycemic control of last 3 - 4 months

### **High HbA1C indicator of**

- Poor glycemic control of last 3 - 4 months
- Poor prognosis
- Increase chances of diabetic complication in future.

### **Advantage of HbA1C over Blood glucose level :**

- Does not get change immediately because of any change in diet or drug or exercise

## 8. Investigations of Hypertension

### Routine tests to rule out primary causes hypertension and rule of complication of it.

1. FBS, PP2BS or RBS
  1. For diagnosis of diabetes
  2. For glucose intolerance due to pheochromocytoma, primary aldosteronism or Cushing's syndrome.
2. Serum creatinine and urea
  1. elevated in renal disease .
3. Serum lipids profile= S.Cholesterol, S. Triglyceride, S. HDL cholesterol, S. LDL Cholesterol, S. VLDL Cholesterol
  1. To exclude atherosclerosis.
  2. both thiazides and beta-blockers on atherogenic .
4. ECG
  1. to assess degree of LV enlargement & valvular abnormality.
5. Urine
  1. Glycosuria = to rule out Hypertensive nephropathy.
  2. Proteinuria = to rule out Hypertensive nephropathy.
6. X-ray of chest
  1. To rule out of cardiac enlargement.
  2. To rule out coarctation, with rib notching and small aortic knob.
7. Serum Uric acid
  1. Hyperuricemia is more common in patients with renal hypertension.
8. Liver function test
  1. Elevated enzyme levels may in high alcohol intake

### INVESTIGATION OF RENO-VASCULAR HYPERTENSION:

1. Plain x-ray of kidney
2. Renal ultrasound - for demonstrating renal cysts or obstruction
3. Renal biopsy
4. Plasma Renin activity

### INVESTIGATION OF ENDOCRINE HYPERTENSION :

1. Cushing's syndrome
  - a. High urinary cortisol excretion
2. Conn's syndrome-
  - a. Hyperaldosteronism
3. Pheochromocytoma
  - a. Increase epinephrine & Nor epinephrine
  - b. Urinary Vanillylmandelic acid
4. Renin secreting tumors.
  - a. Increase serum renin

## 9. Cardio-Pulmonary Resuscitation

### Indication

- Acute ischemic heart disease
- Drowning
- In accidental injury
- Acute carbon monoxide poisoning
- Cardiac arrhythmia like "Pulseless ventricular tachycardia or Ventricular fibrillation".

### Death may be prevented through CPR

- if airway is obstructed can be reversed
- if apnoea or hypoventilation avoided
- if blood loss prevented or corrected
- if the person is not allowed to be pulseless or hypoxic for more than 2-3mins.

If there is circulatory arrest for more than a few minutes, it may result in irreversible severe hypoxia brain damage.

### Technique of CPR

It is divided into 3 phases:-

1. Basic life support
  - Using little or no equipment.
2. Advance life support
  - When equipment and drug become available
  - Used in which a spontaneous circulation is restored.
3. Prolonged life support
  - Conducted in an intensive care unit.
  - is directed towards salvaging cerebral function in the comatose patient.
  - Maintain a stable circulation, restoring oxygenation & other intensive care.

### Method of CPR:

CPR is started by ensuring Airway, Breath & Circulation (ABC).

- Check for Consciousness
  - by shaking him and shouting at him.
  - Then call for help without leaving the patient.
- Check for Airway
  - Immediately check that he has a patent airway.
  - if patient is unconscious but he is breathing through a patent airway, than he should be rolled on his side with face pointing slightly downwards. head should in tilted backwards and jaw should be supported to keep the airway patent.
  - This position can prevent fall down of tongue to backwards to obstruct the pharynx
  - This position also prevent aspiration of saliva, blood and vomitus and make it drain out of the mouth instead of being aspirated into the lungs.

- Check for Breath
  - If the patient is not breathing, than keep the airway patent and put patient on to his back & artificial ventilation started.
- Check for Circulation
  - Finally, his pulse should be palpated,preferably at the carotid artery in the neck.
  - If patient is pulseless and unconscious, it must be assumed that he is cardiac arrest.
  - In this situation, continuing to provide artificial ventilation, external cardiac massage should also be given to maintain the patient's circulation.
  - If advance life support is available, than patient should be given inotropic support with medicine like adrenaline and atropine

The most important aspect of CPR are:

- Very few interruptions of chest compressions
- Sufficient speed and depth of chest compressions
- completely relaxing pressure between chest compressions
- Not ventilating too much.

### **Standards of CPR**

Compression to ventilation ratio

- In adult = 30:2
- In children = 15:2
- In newborns = 3:1

If an advanced airway such as an endotracheal tube or laryngeal mask airway is available in place, artificial ventilation should occur at a rate of 8–10 per minute ,without pauses in chest compressions.

### **Complication of CPR**

- Rib fracture
- Sternal fracture
- Hemopericardium
- Pneumothorax
- Bleeding in arterial mediastinum

## 10. Etiology & Causes of Congestive cardiac failure

### Cause of Congestive Cardiac Failure

1. Volume over load:
  - Regurgitate valve
    - Aortic regurgitation
  - High output status
    - Pregnancy
    - Hyperthyroidism
    - Cushing syndrome
2. Pressure overload:
  - Systemic hypertension
  - Outflow obstruction
    - Aortic stenosis
    - Mitral stenosis
    - Pulmonary stenosis
    - Pulmonary embolism
3. Loss of muscles:
  - Myocardial infarction
  - Chronic ischemia heart disease
  - Connective tissue diseases
    - Aneurysm of aorta
  - Infection endocarditis
  - Subacute endocarditis
  - Cardiomyopathy
  - Poisons & Toxin
    - Chronic Alcoholism
    - Hemosiderosis (iron toxicity)
    - Doxorubicin (chemotherapeutic agent)
4. Restricted Filling
  - Pericardial diseases & Pericardial effusion
  - Restrictive cardiomyopathy
  - Tachyarrhythmia like Ventricular tachycardia, Ventricular fibrillation

### Clinical feature of Congestive Cardiac Failure

#### Symptoms

- Dyspnea
- Fatigue & weakness
- Cerebral symptoms
  - confusion, difficulty in concentration, headache, insomnia, anxiety, nocturia, oliguria
- Palpitation
- Pedal edema
- Abdominal heaviness
- Nausea & Vomiting

#### Signs

- Tachycardia
- Tachypnea
- Dyspnea
- Paroxysmal Nocturnal Dyspnoea (PND)
- Pale, cold sweaty skin
- Jugular venous pressure is high
- Positive Hepato –Jugular reflex
- Central Venous Pressure > 16 cm H<sub>2</sub>O
- Pulmonary rales (crepitation) inspiratory
- Bronchial spasm & decrease air entry
- Displaced & Sustained apical impulses
- Liver palpable & congested ( in right heart failure)

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## 11. Murmur

### Defination

Murmur are abnormal heart sounds casue by vibration of the valves or the wall or septam of the heart or great vessels.

### Type of Murmur.

1. Systolic Murmur
  - Occur during systole
  - Heard between 1st & 2nd heart sound
2. Diastolic Murmur
  - Occur during diastole
  - Heard between 2nd & 1st heart sound
3. Continues Murmur
  - Present throughout systolic & diastolic

### Cause of Systolic murmur

- Mitral valve regurgitation
- Aortic stenosis.
- Pulmonary stenosis
- Severe anaemia
- Ventricular septal defect
- Coarctation of Aorta

### Cause of Diastolic murmur

- Mitral valve stenosis
- Tricuspid valve stenosis
- Aortic regurgitation
- Pulmonary regurgitation.

### Cause of Continues murmur

- Patent ductus arteriosus.

## **12. Sign & Symptoms of dehydrations**

### **SYSTEMS:-**

- Dryness of Mouth
- Thirst
- Rapid fatigueness
- Ulter - conciousness
- Headache
- Tiredness
- Irritability

### **SIGN:-**

- Hypotension
- Tachycardia
- Tachypnea
- Dry skin
- Dry tongue
- Low urine output
- Skin pinch recoil slowly
- Elevated Body temperature

### 13. Beta- blockers

$\beta$ - Blockers are drugs that block the actions of catecholamine mediated through the  $\beta$ -receptors.

#### Classification:-

1. Non-selective: Propranolol, Sotalol
2. Cardio-selective: Metoprolol, Atenolol,
3. Partial agonists: Pindolol
4. With additional alpha blocking property : Labetalol.

#### Pharmacological actions:-

1. Action on Cardiovascular action:
  - Decrease heart rate
  - Decrease force of contraction and cardiac output.
  - Decrease Blood pressure.
  - A-V conduction delayed.
  - Myocardial oxygen requirement is reduced due to decrease cardiac work.
  - $\beta$ -blocker improve exercise tolerance in patients with angina.
2. Action on Respiratory tract:
  - Contraction of bronchial smooth muscles
  - So it causes increase airway resistance, and may precipitate acute attacks in asthmatics.
3. Action on Eye
  - Reduce intraocular pressure by decreased secretion of aqueous humour.
4. Metabolic changes:
  - Increase blood glucose, as it decrease release of insulin from beta cell of pancreas.
  - Block lipolysis and glycogenolysis
  - Plasma triglycerides may increase
  - HDL levels decreases.

#### Adverse Reactions

- Bradycardia
- Congestive Cardiac Failure
- Cold extremities especially in patients with peripheral vascular disease.
- Acute asthmatic attacks
- Sedation, Depression
- Weakness, Decrease exercise capacity may be seen due to its metabolic effects.

#### Use of $\beta$ -blockers

1. Systemic Hypertension
2. Angina pectoris
3. Cardiac arrhythmias
  - Ventricular tachycardia & Supraventricular tachycardia.
4. Myocardial infarction
  - In patients who have recovered from MI, long term treatments with beta-blockers prolong survival.
5. Portal hypertension
6. Pheochromocytoma

- Propranolol is given with alpha blockers before surgery to control hypertension.
- 7. Thyrotoxicosis
  - Propranolol controls palpitation, tremors and makes symptomatic relief in thyrotoxicosis.
- 8. Glucoma
- 9. Prophylaxis of Migraine
- 10. Anxiety
  - 2) Propranolol prevents the anxiety e.g in public speaking, in examination and stage performance .

**Contra-indication :**

1. Diabetes mellitus
2. Bronchial asthma
3. COPD
4. Congestive cardiac failure
5. 1<sup>st</sup> , 2<sup>nd</sup> or 3<sup>rd</sup> degree block

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## 14. Bone Marrow Suppression

### Defination:

Bone marrow suppression means decrease in production of WBC, RBC, Platelet cells from bone marrow cells.

### Causes:

1. Congenital
2. Acquired:
  - Post-Chemotherapy
  - Post -Radiotherapy
  - Drugs : Fluoroquinolone , Cephalosporine , Methotrexate
  - Chemicals and toxins like benzene and DDT
  - Viral Infections : Dangué fever,
  - Malignancy : Acute lymphocytic leukemia , metastasis lesion in bone marrow

### Clinical features:

1. Symptoms due to anaemia
  - Weakness
  - Fatigability
  - Dyspnoea on exertion
2. Symptoms due to thrombocytopenia:
  - Haemorrhage
  - Bleeding from gums and alimentary tract
  - Rarely cerebral haemorrhage
3. Symptoms due to neutropenia
  - Fatigue
  - Ulceration of mouth and pharynx
4. Symptoms due to leucopenia
  - Chronic skin infection
  - Recurrent chest infection
  - Sore throat

### Diagnosis:

- Complete Blood Count
  - o Anemia
  - o Low platelet count
  - o Low WBC
  - o Low RBC
- Peripheral Blood
  - o Microcytosis in RBC
  - o Low reticulocyte
  - o Platelet small in size
  - o Abnormal cells
- Bone Marrow aspiration or Biopsy

## 15. Hyperkalemia

### DEFINITION

The condition in which the concentration of serum potassium is elevated more than 5.5 mmol/l.

### **Causes**

- 1) Inadequate excretion in the condition like
  - Acute or Chronic Renal Failure
  - Hypoaldosteronism
  - Potassium sparing diuretics
  - Adrenal insufficiency
  - Addison's disease
- 2) Shift of potassium from intra cellular to extra cellular
  - Metabolic acidosis like diabetic ketoacidosis
  - Major tissue injury like Poly-trauma, Crush injury
  - Insulin deficiency
  - Hyperglycemia
  - Hyperkalemic periodic paralysis
- 3) Excessive intake of potassium (especially with impaired renal function)

### **Clinical Features**

Skeletal muscle weakness

Bradycardia

Brady-arrhythmia

Cardiac arrest

### **Diagnosis**

Serum potassium level more than 5.5 mEq/l

ECG changes:

- Tall T wave
- Short QT interval
- Widened QRS

### **Treatment**

- 1) Intravenous glucose with Insulin
  - Make internalization of potassium into cell
- 2) Sodium bicarbonate
  - To correct metabolic acidosis and facilitate potassium into cell
- 3) Calcium gluconate
  - prevent sudden cardiac arrest
- 4) B<sub>2</sub> agonist i.e salbutamol
- 5) Ion exchange resin
  - calcium polystyrene sulphate for removal of potassium from the body by decrease its absorption from GIT.
- 6) Furosemide
  - Increase excretion of potassium in urine
- 7) Dialysis

## 16. Total Parenteral Nutrition (TPN)

### Definition

Total Parenteral nutrition (TPN) is sterile intravenous solution of protein, dextrose and fat in combination with electrolytes, vitamins, trace elements and water.

### Indications

- Major bowel surgery
- ulcerative colitis
- Ulcerative colitis
- Bowel obstruction
- Congenital GI anomalies
- Bowel injury
- Major Trauma
- Burns
- Malabsorption syndrome
- Malnutrition
- Severe pancreatitis
- Critical illness with wasting disorder

### Given Through:

- Central venous line
- Subclavian vein
- Femoral vein

### Complications of TPN

- Hyperglycaemia
- Rebound Hypoglycaemia .
- Fluid overload.
- Electrolyte and acid-base disturbance
- Fluid imbalance
- Hypertriglyceridemia
- Systemic sepsis
- Air Embolism & Thrombosis.
- Clot in venous catheter.

### Contraindication

- Congestive cardiac failure
- Renal failure

### Requirement of TPN:

1. Fluid = 20–40 mL/kg/day
2. Energy requirement = 25-30 kcal/kg/day
3. Glucose = 5% to 20% dextrose solution .  
=infusion rate = 4- 5 mg/kg/min
4. Protein = 1 - 2 gm/kg/day  
= Including Essential Amino acid
5. Fat = 20 - 30 % of total TPN  
= Essential Fatty acid
6. Vitamins
7. Mineral

## 17. Diagnosis of Systemic Lupus Erythematosus

### Clinical features of SLE

#### A. Dermatologic

- Cutaneous vascular lesions
- Butterfly rash
- Oral/nasopharyngeal ulcers
- Alopecia

#### B. Musculoskeletal

- Polyarthralgia with morning stiffness
- Subluxation with hyperlaxity of joints
- Swan Neck Deformity

#### C. Cardiopulmonary

- Pleurisy
- Dysrhythmias
- Accelerated CAD
- Pericarditis

#### D. Renal

- Nephritis
- Ranging from mild proteinuria to glomerulonephritis

#### E. Nervous system

- Generalized/focal seizures
- Peripheral neuropathy
- Cognitive dysfunction
- Disorientation
- Memory deficits

#### F. Hematologic

- Formation of antibodies against blood cells
- Anemia
- Leukopenia
- Thrombocytopenia
- Coagulopathy

#### G. Infection

- Increased susceptibility to infections
- Fever should be considered serious
- Infections such as pneumonia are a common cause of death

### American college of rheumatology diagnosed criteria in SLE :

1. Serositis
  - pericarditis on examination.
2. Oral ulcers
  - In oral ,nasopharyngeal, palate
  - painless
3. Arthritis
  - 2 or more peripheral joint with tenderness or swelling.
4. Photosensitivity
5. Blood disorder
  - leukopenia, lymphopenia, hemolytic anemia, thrombocytopenia.



6. Renal involvement
  - Proteinuria.
7. Neurological disorder
  - Generalized / Focal Seizures
  - Peripheral neuropathy
8. Malar Rash

**Investigation of SLE :**

- Anti Nuclear Antibody (ANA)
- Anti DNA antibody
- Anti Smith antibody
- CBC count with differential count
  - leukopenia, lymphopenia and anemia.
- Serum creatinine.
- Urine analysis
- Liver function test.
- C3 and C4 levels are often depressed
  - as a result of consumption by immune complex-induced inflammation.
- Creatinine kinase level
  - may be elevated in myositis or overlap syndromes.

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## 18. Life style Modification in case of Peptic ulcer

- Rest
  - Physical and Mental
  - Relief from anxiety and mental stress
  - Good sleep
  - Regular sleeping and eating patent
- Diet
  - Frequent small meals
  - Ingestion of Milk
  - More amount of fiber
  - Fat free diet
- Avoid fried food
- Avoid caffeine-containing beverages like coffee, tea
- Avoid addiction like alcohol & smoking
- Avoid Spices
- Avoid more use drug like NSAID, Oral corticosteroid
- Avoid taking food at late
- Avoid supine position immediate after food.
- Brisk walking for 20 – 30 minute after taking dinner

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## 19. Differential diagnosis of joint pain

### 1) Osteoarthritis :

- Symptoms :
  - Old Age
  - Mainly in lower limb – Knee & Hip Joint
- Sign :
  - Synovial effusion
  - Tenderness
- Investigation :
  - In X-ray , loss of joint articulation
  - Osteophytes in joint space

### 2) Rheumatoid arthritis :

- Symptoms :
  - Smaller Joint like Inter phalangeal , Inter metacarpophalangeal joint
  - Stiffness in joint
- Sign :
  - Swelling in Joint
  - Joint Deformity
- Investigation :
  - Serum Rheumatoid Factor Positive
  - Serum Anti-Nuclear Antibody (ANA) raised

### 3) Rheumatic arthritis :

- Symptoms :
  - Pain in multiple joint
  - Migrating involvement of Major joint
  - Fever
- Sign :
  - Tenderness
  - Associated Erythema Marginatum or Subcutaneous nodules
- Investigation :
  - Serum ASO titer raise
  - High ESR

### 4) Gouty arthritis :

- Symptoms :
  - Pain aggravate in Winter
  - Mainly in Distal Joints
- Sign :
  - Joint Effusion with Crackling on Joint movement
- Investigation :
  - High Serum Uric acid level

## 5) Leukemia

- Symptoms :
  - High grade fever
  - Multiple - Big as well as Small Joint
  - Bone pain
- Sign :
  - Bony tenderness
  - Petechia due to thrombocytopenia
  - No Swelling, No Effusion
- Investigation :
  - Blood Peripheral Smear – Abnormal Cell morphology
  - Thrombocytopenia
  - Leucocytosis or Leucopenia

## 6) Ligamental Injury

- Symptoms :
  - History of Injury
  - Single Joint involment
  - Single joint effusion
- Sign :
  - Abnormal Joint movement
- Investigation :
  - MRI – Ligament injury
  - X-Ray - No Chronic Damage , No Joint Deformity

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## 20. Transudative and Exudative Pleural effusion

	<b>Transudative Effusion</b>	<b>Exudative Effusion</b>
<b>Definition</b>	Filtration of plasma or blood without changing membrane permeability	Shifting of Fluid from plasma or blood due to changing membrane permeability or vascular injury or inflammation
<b>Pathogenesis</b>	Non- Inflammatory	Inflammatory
<b>Cause</b>	Cirrhosis of Liver Congestive cardiac failure Hypoproteinemia Malnutrition Nephrotic syndrome	Infective disease due to bacteria, tuberculosis ,virus etc. Malignancy Pulmonary embolism or infarct SLE
<b>Physical Property of Fluid</b>	Pale Yellowish in Colour Clear	Yellowish or Bloody Turbid
<b>pH</b>	> 7.2	< 7.2
<b>Specific Gravity</b>	Low	High
<b>Glucose</b>	60 – 80 mg % (2/3 of the plasma glucose)	- Very Low in Bacterial infection - < 40 mg% in Tuberculosis - 40 – 60 mg% (Slight low to Normal) in Viral infection
<b>Protein</b>	< 3 gm %	> 3 gm %
<b>LDH</b>	< 200 IU/L	> 200 IU/L
<b>Effusion : Plasma LDH</b>	< 0.6	> 0.6
<b>RBC</b>	Absent	- Plenty in Malignancy - Present in Pulmonary infarct
<b>WBC</b>	< 1000 cells /c.mm	> 1000 cells /c.mm
<b>Clinical Feature</b>	No Fever Dry Coughing Or Coughing with Watery expectorant	Fever Coughing with expectorant <ul style="list-style-type: none"> <li>• Hemoptysis</li> <li>• Purulent</li> </ul>
<b>Investigation</b>	Liver Function Test <ul style="list-style-type: none"> <li>• Serum Total Protein</li> <li>• Serum Billirubin</li> <li>• Serum ALT</li> </ul> 2D-Echo S.Creatinine S.Cholesterol	Complete Blood Count Sputum Examination Serum D-dimer Lung / Pleural biopsy Anti Nuclear Antibody

## 21. Define intermittent claudication

- It is severe cramping pain or discomfort on walking which disappear after rest & re-occur when the walk is resumed.
- The position of pain of claudication depend on the level of arterial lesion.
  - a) Calf claudication: usually due to obstruction in femoral popliteal segment.
  - b) Thigh claudication: usually due to iliac occlusion with associated buttocks claudication.

### Diagnosis:

#### I. Ankle Brachial Plexus Index:

- Systolic BP in the legs is slightly greater than the upper limb.
- It is calculated from the ratio of ankle & brachial systolic pressure.
- It is a sensitive index for diagnosis of arterial insufficiency.
- **Ankle brachial plexus index** >1.0 is normal
- **Ankle brachial plexus index** < 0.9 is abnormal.

#### II. Doppler Study

#### III. Transcutaneous Oximetry

- **Assessment of impaired flow secondary to both microvascular and macrovascular disruption.**

#### IV. Exercise test:

- Is performed by the patient for 5 minutes stay on treadmill.

#### V. Peripheral Arterial Angiography:

- Define extent disease & possibility of bypass surgery.

### Management:

- Efficacy:
  - Walking improve claudication distance.
  - Walking Exercise type:
- Time:
  - Start 3-5 times per week for 30 minute.
  - Increasing by 5 minute until 50 minute.
  - Continue for at least 6 month.
- Intermittant walking technique:
  - Walk until moderate to near maximum claudication pain.
  - Rest in sitting or standing position.
  - Restart walking when claudication symptoms tolerable.
  - Rest if presence of pain
- No smoking
- Reduction of obesity.
- Care of feet.
- Antiplatelet therapy: Aspirin
- Adequet control of diabetes.

## 22. Differential diagnosis of Chest Pain

### 1) Myocardial Infarction :

- Symptoms :
  - Sharp stabbing pain with Perspiration & Nausea.
  - Radiating pain to left arm or shoulder.
- Sign :
  - Hypotension & Bradycardia in Inferior wall MI
  - Tachycardia in Anterior or Lateral Wall MI
- Investigation :
  - In ECG, ST-T Elevation
  - In 2D-Echo, Hypokinetic Myocardial Wall motion

### 2. Angina Pectoris :

- Symptoms :
  - On and Off Pain on exertion with Perspiration
  - Chest pain relieve from Nitroglycerin
- Sign :
  - No Positive sign
- Investigation :
  - In ECG, ST-T depression & T- inversion
  - TMT Positive

### 3. Pulmonary embolism :

- Symptoms :
  - Breathlessness or Respiratory distress with Coughing
  - Crushing Chest pain
- Sign :
  - Tachypnia
  - Respiratory Rhonchi
  - Decrease Air entry on affected area
- Investigation :
  - Pulmonary CT Angiography show decrease Pulmonary artery filling area in affected area
  - D-Dimer raised

### 4. Reflux esophagitis & Gastritis :

- Symptoms :
  - Retrosternal Burning pain & Nause
- Sign :
  - Epigastric tenderness
- Investigation :
  - USG abdomen – Inflammatory gastric mucosa & ulcer
  - Upper Gastro-intestinal Endoscopy

### 5. Skeleto-Muscular Injury

- Symptoms :
  - Dull Aching pain
  - Increase with arm & chest movement & Reduce with rest
- Sign : Tenderness
- Investigation : X-ray chest may reveal injury.

## 23. Treadmill Test

**Definition** It is a test to measure a heart's ability to respond to external stress with exercise, in a controlled clinical environment

### Indication

- For diagnosis and Prognosis of Cardiovascular disease.
- For diagnosis and Prognosis of Coronary Arterial Disease.

### Absolute Contraindication

- Acute myocardial infarction within 48 hours
- Unstable angina
- Uncontrolled cardiac arrhythmia
- Severe Aortic stenosis
- Pulmonary embolism
- Multi vessel coronary artery diseases
- Congestive Cardiac failure
- Uncontrolled hypertension
- Severe pulmonary hypertension

### Relative contraindications

- Left main coronary stenosis
- Moderate stenotic valvular heart disease
- Electrolyte abnormalities
- Severe arterial hypertension
- Tachy arrhythmias or brady arrhythmias
- Hypertrophic cardiomyopathy
- Mental or physical impairment

### Standard Bruce Treadmill Protocol

- 1.7mph 10%grade 5 METs 3mins
  - 2.5mph 12%grade 7 METs 3mins
  - 3.4mph 14%grade 9 METs 3mins
- (MET = Metabolic Equivalents of Task)

### Modified Bruce Treadmill Protocol

- 2 warm up stages of 3 minutes.
- 1.7mph 0 %grade 3 METs 3mins
- 1.7mph 5 %grade 3 METs 3mins
- 1.7mph 10%grade 5 METs 3mins
- 2.5mph 12%grade 7 METs 3mins
- 3.4mph 14%grade 9 METs 3mins
- 4.2mph 16%grade 13 METs 3mins
- 5.0mph 18%grade 16 METs 3mins
- 5.5mph 20%grade 19 METs 3mins
- 6.0mph 22%grade 22 METs 3mins



**Interpretation of test findings**

- J point = Junction of the point of onset of the ST-Twave
- ST80 = Point that is 80 msec from the J point
- Depression of 0.1 m (1 mm) or more
- ST segment slope with in the range of +1 mV/sec in 3 consecutive beats

**Termination of test**

- Drop in systolic BP of more than 10 mmHg from baseline
  - Moderate to Severe angina
  - Increasing nervous system symptoms
  - Signs of poor perfusion
  - Vertricular tachycardia
  - ST-T elevation
1. Fatigue
  2. Brathlessness
  3. Leg cramps or claudication
  4. Ting chest pain

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## 24.Migraine

### DEFINATION:-

Recurrent episodes of headache

Most often unilateral

Varying intensity

Associated with visual or sensory symptoms,+ "Aura"

Aura may occur during or afterward

### Classification :-

- Migraine without aura (formerly, common migraine)
- Migraine with aura (formerly, classic migraine)
- Chronic migraine

### Type of Migraine :

- Migraine without Aura
- Migraine with Aura
- Migraine Aura without Headache
- Vestibular Migraine
- Basilar Migraine
- Hemiplegic Migraine
- Ophthalmoplegic Migraine
- Other Migraine

### Symptoms

Moderate to severe pulsating headache

Usually felt on the single side of the head.

Aura may be present like –

Nausea ,Loss of Appetite

Confusion,

Visual disturbances - Blurred vision, Mood changes,

Abnormal sensation - Numbness, Tingling sensation in hands & face

Muscle weakness

Trouble in speech

Increased sensitivity to light, sound and smell.

Attacks typically last for 4-72 hours & they repeat few times a week.

### Risk factor :

- Family history
- Sex (Women>Men)
- Age (1st Migraine during adolescent, but can usually start at any age < 40 yrs)
- Stress – Psychological Stress
- Food & Drinks-Dieting, Dehydration , Monosodium Glutamate.
- Hormonal changes
- During menstrual cycles
- Excessive use of OC Pills
- Hormonal Replacement Therapy
- Pre-menstrual period
- Pre-menopausal
- Stress (Anxiety, Depression) Sensation-loud sound, noises, bright lights, etc.

- Illness-Infections such as cold or the Flu-in children.

**Pathophysiology :**

Idiopathic

Change in the level of SEROTONIN hormone.

It have an effect on the blood vessels.

High Serotonin = blood vessels constricts

Low Serotonin = blood vessels dilated

This dilatation can cause pain or other problems.

May be due to abnormal a spreading pattern of electrical activity in the brain.

**Management :**

**1. Management of Acute attack :**

NSAID : Aspirin, Ibuprofen , Naproxen

Ergotamine :

Triptan : Sumatriptan

Dopamine Antagonist : Metoclopramide

Serotonine Uptake Inhibitor : Fluoxetine

**2. Prevention :**

Beta blockers : Propranolol

Tricycline Antidepressant : Amitriptylin

Calcium Channel Blocker : Flunarazine

Anti Epileptic : Gabapentin

## 25. Indications of dialysis

- Acute renal failure:
  - Criteria (Biochemical indications):
    - Blood urea > 200 mgm/dL
    - Serum Creatinine >10 mgm/dL
    - Serum K+ > 6 meq/L
    - HCO<sub>3</sub> < 10 meq/L
    - pH < 7.2
- Chronic renal failure
- Metabolic Acidosis
- Electrolyte abnormality like hyperkalemia
- Intoxication by SLIME:
  - Salicylic acid
  - Lithium
  - Isopropanol
  - Magnesium (laxatives)
  - Ethylene glycol
- Overload of fluids (not responding to diuretics)
- Uremia complications

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## 26. Glasgow Coma Scale

It is a neurological scale for measuring level of consciousness of the patient.

In which scoring is determined by three factors:

- Eye opening = 4 Grading
- Verbal responsiveness = 5 Grading
- Motor responsiveness. = 6 Grading
- Total Grading Score = 15

### A. Eye Gradings.

1. No response
2. Response to pain only.
3. Response to verbal stimuli, command, speech.
4. Spontaneous opening of eye.

### B. Verbal Grading

1. No response.
2. Incomprehensible speech.
3. Inappropriate words.
4. Confused conversation but able to answer the questions.
5. Oriented.

### C. Motor Grading

1. No response
2. Extension in response to pain
3. Flexion in response to pain
4. Withdraws in response to pain.
5. Purposeful movement to painful stimuli.
6. Obeys commands for movement.

## 27. Glucocorticoid

### Introduction :

- Corticosteroid = Glucocorticoids & Mineralocorticoids
  - Glucocorticoids produce in the zona fasciculata of the adrenal cortex
  - Mineralocorticoids produce in the zona glomerulosa of the adrenal cortex
- Cortisol (or hydrocortisone) is the most important human glucocorticoid.
- It is essential for life and it regulates important cardiovascular, metabolic, immunologic and homeostatic functions.

### Mechanism of Action:

- Glucocorticoids bind to the cytosolic Glucocorticoid Receptor (GR)
- Hormone + GR = Newly Complex Form
- Translocates itself into the cell nucleus.
- Where Complex binds to Glucocorticoid Response Elements (GRE) in the target genes.
- Binding with GRE changes the regulation of gene expression.
- This cause activation of transcriptional and synthesis of specific protein .
  - Including, for example,
    - Anti-inflammatory proteins
    - Enzyme of gluconeogenesis

### Type of Glucocorticoids:

Name	Glucocorticoid potency	Mineralocorticoid potency	Terminal half-life (hours)
Cortisol (hydrocortisone)	1	1	8
Prednisolone	4	0.8	16–36
Methylprednisolone	5–7.5	0.5	18–40
Dexamethasone	25–80	0	36–54
Betamethasone	25–30	0	36–54
Triamcinolone	5	0	12–36

### Clinical Use :

- Anti Inflammatory
- Anti-allergic
- Immunosuppressant in
  - Auto-Immune disorder like,
    - Rheumatoid Arthritis
    - Systemic Lupus Erythematosus
    - Inflammatory Bowel Disease
- Acute lymphoblastic leukemia
- Renal Transplantation, in order to avoid the Allograft Rejection.
- Non Infective Inflammatory conditions
  - Acute Bronchial Asthma
  - Degenerative disorders of peripheral joints and spine
  - Disc herniation
  - Spondylolysis

- Spinal stenosis
- Osteoarthritis of spine & peripheral joints

**Contraindication:**

- Infections
- Hypertension with CCF
- Psychosis
- Peptic Ulcers
- Diabetes mellitus
- Osteoporosis
- Pregnancy (mainly prednisolone)

**Adverse Effect :**

- Hyperglycemia
- Osteoporosis
- Increase cholesterol and triglyceride levels
- Increases risks of ulcers and gastritis
- Delay wound healing, which requires certain amount of inflammation
- Suppresses immune system
- More prone to infections
- Loss of muscle tissue
- Cushing's syndrome
- Hypertension
- Acne
- Round face
- Weight gain

**Withdrawal :**

- Use of high-dose steroids for more than a week
- Begins to produce suppression of the patient's adrenal glands
- Because the exogenous glucocorticoids suppress hypothalamic CRH and pituitary ACTH .
- With prolonged suppression, the adrenal glands get atrophy (physically shrink)
- It can take months to recover full function after discontinuation of the exogenous glucocorticoid.
- During this recovery time, the patient is vulnerable to adrenal insufficiency during times of stress, such as illness.
- So Gradual tapering is require during withdrawal of glucocorticoid.

## Short Notes Awaited

- 28.** Kawasaki disease
- 29.** Plumer Wilson Syndrome
- 30.** Kartagener Syndrome
- 31.** Harmful Effect of Smoking
- 32.** Type or Mode and Parameters of Ventilatory Support
- 33.** Positive & Negative Nitrogen Balance
- 34.** Complete Heart Block
- 35.** Diphtheria
- 36.** Pertussis
- 37.** Group of Antibiotic . It's Example & Use
- 38.** Rabies

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