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A Unique Newsletter only for Intern Doctors

Vision

This Issue CONTAINS

Review Article-“Dengue in Critical Condition” 01

Cover Article-Pacemaker Therapies in Cardiology 08

Study in Abroad- MRCP (UK) 11

Medi Quiz 12

Practical Procedure 13

International Marketing 15

MSD Activities 17

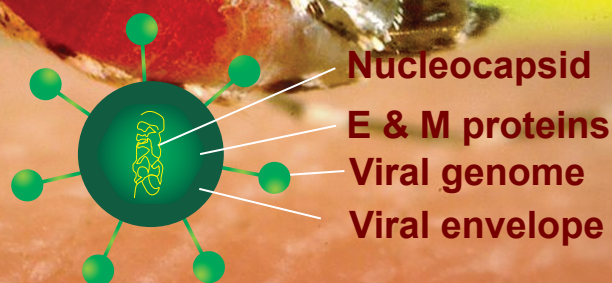
Flash News- Medical Innovations 19

Novel Drug- by FDA for 2023 21

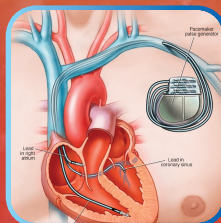
BCS Preparation 22

Product List 23

Word & Letter Puzzle 28



Dengue virus structure



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Welcome to the 20th Edition of "Intern Vision"

First of all we would like to give special thanks to all of our valued readers for mass participation & suggestions in the previous issue of Intern Vision. In every issue we strongly try to review this news letter according to your valuable opinion.

In this issue we have highlighted the features of "Dengue in Critical Condition-Information for Health Care Practitioners" as Review Article & Pacemaker Therapies in Cardiology as Cover Article which is very important for a medical professional and information about MRCP (UK-Part 2) course. It also helps to build-up post graduation career.

We have also focused on Practical procedure about 'Resuscitation: Hospital Management of Cardiopulmonary Arrest for Infants & Children' which is very much important for an intern doctor of his/her day to day activities at hospital and BCS Guide lines which is more informative for a young medical professional.

Our regular features (Medi Quiz, Word & Letter Puzzle) are in this issue as usual.

Every cordial effort has been made to make this issue interesting & helpful to you.

We sincerely expect your valuable suggestions for further excellence of

INTERNVision

With regards,

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Dengue in Critical Condition

Information for Health Care Practitioners

Dengue is a mosquito-borne disease caused by any one of four closely related dengue viruses (DENV-1, -2, -3, and -4). Infection with one serotype of DENV provides immunity to that serotype for life, but provides no long-term immunity to other serotypes. Thus, a person can be infected as many as four times, once with each serotype. Dengue viruses are transmitted from person to person by *Aedes* mosquitoes (most often *Aedes aegypti*) in the domestic environment.

Pathophysiology of Dengue Infection:

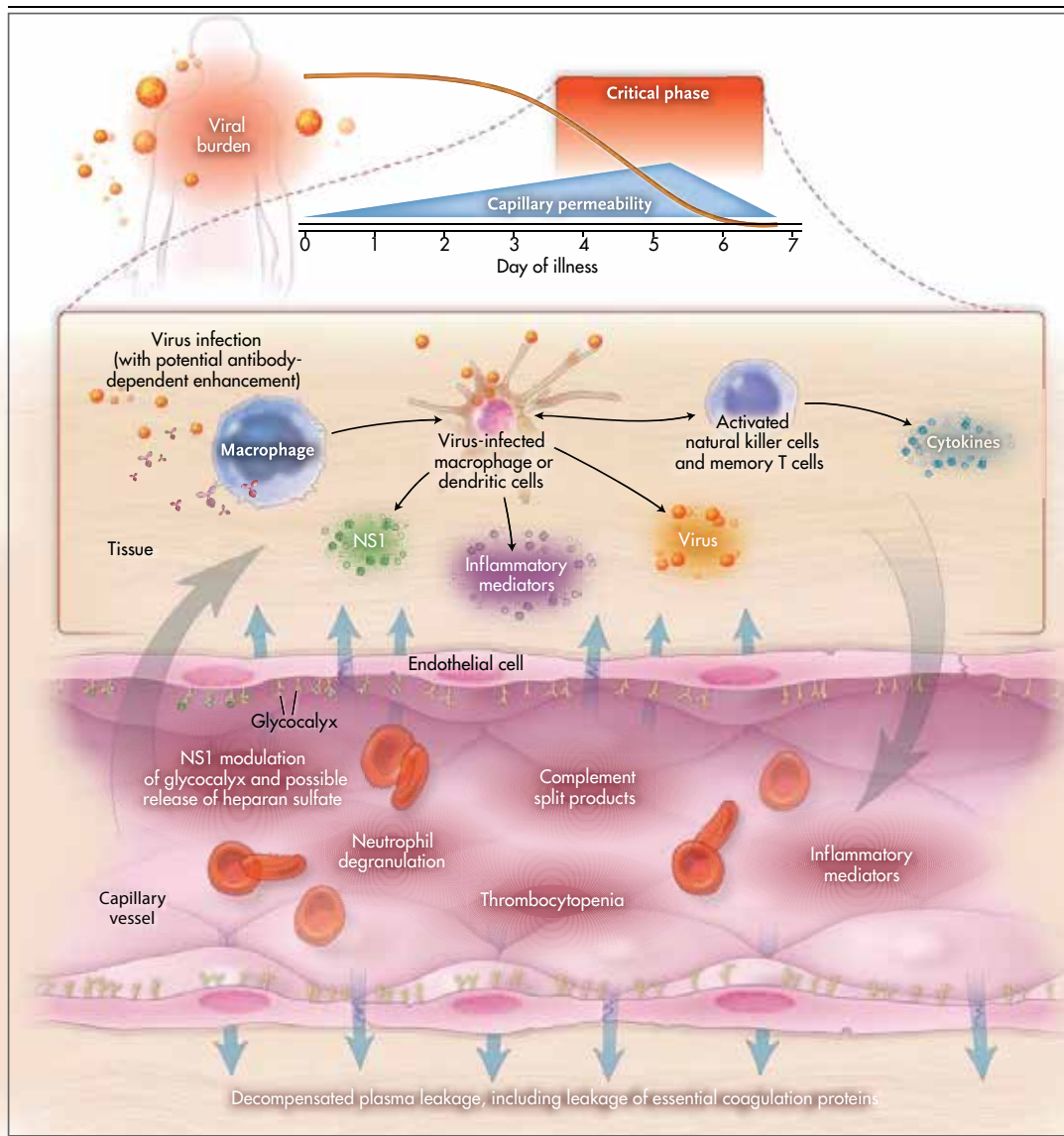


Figure 1 - Pathophysiology of dengue infection

Ref: Dengue: Review article, Simmons CP, Jeremy J. Farrar JJ, Vinh Chau NV, Wills B, *N Engl J Med*: April, 2012; 366:pp-1427)

- The pathogenesis of dengue involves a complex interaction between virus and host factors, and remains incompletely understood. The immune system plays a key role in disease pathogenesis. Various mechanisms of severe disease have been suggested, including: (a) Antibody-dependent enhancement or ADE, (b) T-cell mediated immunopathology, (c) Complement activation by virus-antibody complexes and (d) Cytokine abundance.
- Non-neutralizing cross-reactive antibodies elicited in a primary infection bind virus in a secondary infection and then have a greater ability to infect Fc-receptor bearing cells (Monocytes, macrophages). This is called antibody-dependent enhancement (ADE) and potentially leads to an increased viral biomass and therefore more chance of developing severe disease. In addition, there is evidence that ADE immunologically modulates infected cells in such a way that the micro environment becomes more supportive of DENV replication.
- The proliferation of activated memory T-cells and the production of proinflammatory cytokines contribute to the development of plasma leak observe in severe dengue.
- Dengue infected monocytes act as antigen presenting cells (APCs) to induce release of lymphokines and other factors from activated T-cells. Tumour Necrosis Factor- α , Interleukin (IL) IL-1 β , IL-2, IL-6, IL-8, Interferon gamma (IFN γ), RANTES etc. are the cytokines that are released from these cells.
- These cytokines along with complement breakdown products (C3a, C5a) activated in DHF/DSS, increases vascular permeability of vascular endothelial cells leading to DSS.
- Antibody dependent enhancement and inappropriate memory T-cell response are central to the pathogenesis of DHF/DSS.

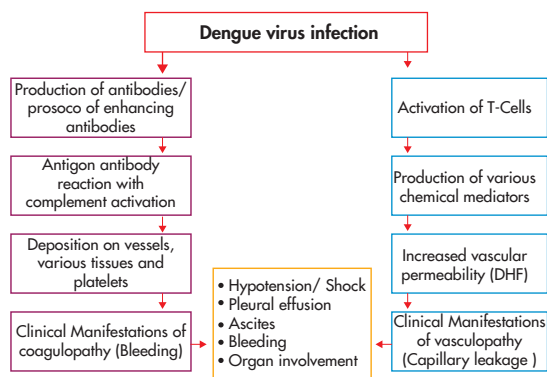


Figure 2 - Flow Chart of Pathophysiology of dengue infection

Clinical Diagnosis:

Classic dengue fever, or “break bone fever,” is characterized by acute onset of high fever 3–14 days after the bite of an infected mosquito. Symptoms include

- frontal headache,
- retro-orbital pain,
- myalgias & arthralgias,
- hemorrhagic manifestations,
- Rash and low white blood cell count.
- The patient also may complain of anorexia and nausea.
- Acute symptoms, when present, usually last about 1 week, but weakness, malaise and anorexia may persist for several weeks.
- A high proportion of dengue infections produce no symptoms or minimal symptoms, especially in children and those with no previous history of having a dengue infection.
- The main medical complications of classic dengue fever are febrile seizures and dehydration.

Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome

DHF is currently defined by the following four (World Health Organization (WHO) criteria):

- Fever or recent history of fever lasting 2–7 days.
- Any hemorrhagic manifestation.
- Thrombocytopenia (platelet count of $<100,000/\text{mm}^3$).
- Evidence of increased vascular permeability

Around the time the fever begins to subside (usually 3–7 days after symptom onset), the patient may develop warning signs of severe disease. Warning signs include

- severe abdominal pain,
- persistent vomiting, marked change in temperature (from fever to hypothermia),
- hemorrhagic manifestations,
- or change in mental status (irritability, confusion, or obtundation).

The most common hemorrhagic manifestations are mild and include

- a positive tourniquet test,
- skin hemorrhages (petechiae, hematomas),
- epistaxis (nose bleed),
- gingival bleeding (gum bleed), and
- microscopic hematuria.

More serious types of hemorrhage include

- vaginal bleeding,
- hematemesis,
- melena and
- intracranial bleeding.

Convalescent Phase

During the recovery phase the extracellular fluid which was lost due to capillary leakage returns to the circulatory system and signs and symptoms improve. This phase usually after 6-7 days of fever and last for 2-3 days. Longer convalescence may be expected in some of the patients with severe shock, organ involvement and other complications which may require specific treatment. Patient may develop pulmonary oedema due to fluid overload if the fluid replacement is not optimized carefully.

Evidence of Plasma leakage

- Haematocrit (HcT) - With the leakage of plasma there will increase in HcT. A 20% rise of HcT from the baseline is indicative of significant plasma leakage.
- Plasma leakage is due to increased capillary permeability.
- Plasma leakage in DHF is selective and transient and usually lasts for 24-48 hours.
- Ascites and pleural effusion may develop.

Therefore, early detection of critical period (onset of plasma leakage) and appropriate fluid management is of paramount importance. These patients may develop overt or concealed bleeding during the course of illness.

Other evidence of plasma leakage is:

- non-fasting serum cholesterol (<100 mg/dl).
- The degree and the rate of plasma leakage in DHF can vary.
- Severe leakage may develop shock, which may be complicated with organ impairment, metabolic acidosis and disseminated intravascular coagulation (DIC).

Tourniquet Test (TT)

This is a very important clinical test for detecting covert hemorrhage. The tourniquet test is performed by inflating a blood pressure cuff applied usually to the forearm to a point mid-way between the systolic and diastolic pressures for five minutes. After deflating wait for return of normal skin hue and then count the number of petechiae. A test is considered positive when 10 or more petechiae per 1 inch² are observed in the exposed part below the cuff. In DHF, the test usually gives a definite positive result when there is ≥ 20 petechiae

per 1 inch² with a sensitivity of more than 90%. Sometimes in lieu of petechiae linear streaks of echymosis may be seen in the cuff applied area. The test may be negative or mildly positive only during the phase of profound shock.



Photo 1: Tourniquet Test (TT)

Capillary Refill Time

This is a clinical examination for volume status of the body. It can be measured by pressing the nail of the thumb of left hand in right handed person or vice versa till blanching then suddenly release the pressure. The time taken for flushing is the capillary refill time and if it is more than 3 sec, there is gross hypovolemia.



Photo 2 : Capillary Refill Time

Dengue Shock Syndrome

Significant loss of plasma leads to hypovolemic shock. Even in these shock cases, prior to intravenous fluid therapy, pleural effusion and ascites may not be detected clinically. Radiographic and ultrasound evidence of plasma leakage precedes clinical detection. A right lateral decubitus chest radiograph to detect pleural effusion and gall bladder wall oedema is associated with plasma leakage and may precede the clinical detection. Dengue Shock Syndrome is a prevention of Dengue Syndromes when there are criteria of DHF plus signs of circulatory failure, manifested by:

- Rapid and weak pulse

- Narrow pulse pressure ($\leq$ to 20 mm Hg)
- Hypotension for age
- Cold clammy skin
- Restlessness
- Undetectable pulse and blood pressure

Expanded Dengue Syndrome

Patients with dengue illness can sometimes develop unusual manifestations such as involvement of liver, kidneys, brain or heart with or without evidence of fluid leakage and therefore do not necessarily fall into the category of DHF. These conditions are very rare and management is symptomatic. Such unusual manifestations may be associated with coinfections and comorbidities. However, these manifestations if seen in DHF patients are mostly a result of prolonged shock leading to organ failure.

Dengue Case Management

This clinical guide uses three categories for case management (A, B, C) based on the model of case classification that follows (Figure 3) after a patient has fulfilled the criteria for probable dengue.

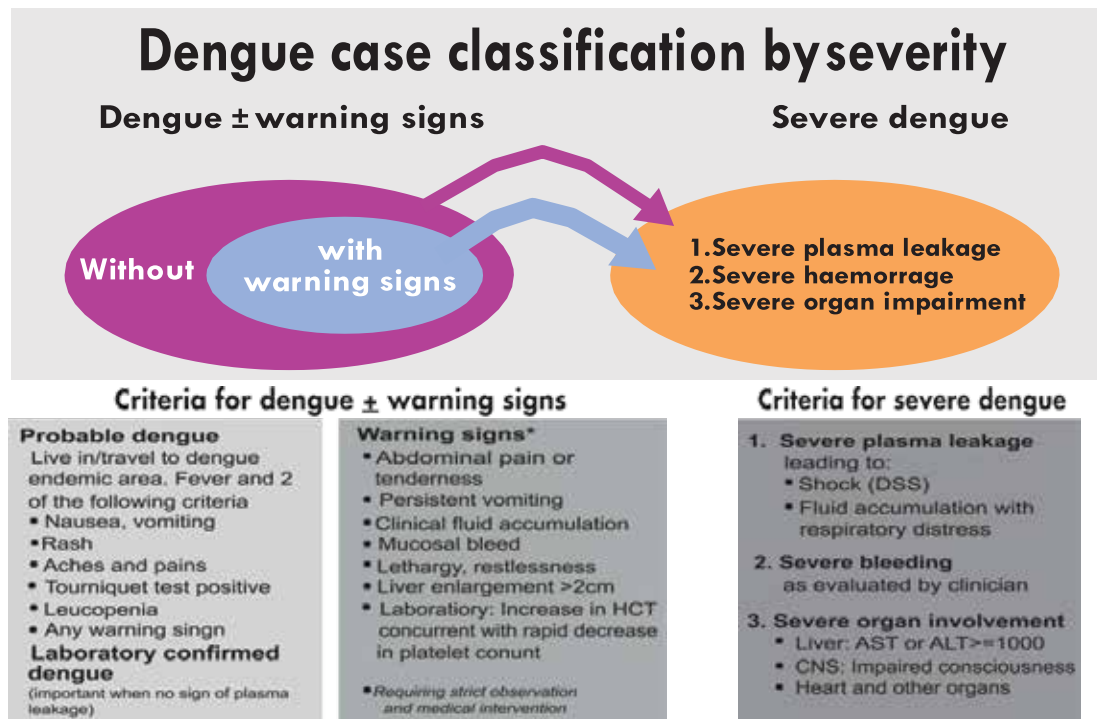


Figure 3 - Dengue case classifications

ALT = alanine aminotransferase; AST = aspartate aminotransferase; CNS = central nervous system; DSS = dengue shock syndrome; HCT = haematocrit

DENGUE CASE MANAGEMENT

ASSESSMENT	Presumptive Diagnosis Live in/travel to endemic area plus fever and two of the following 1. Anorexia & Nausea 2. Rash 3. Aches or pain 4. Warning sign 5. Leukopenia 6. Tourniquet test positive Lab confirmed dengue (Important when no sign of plasma leakage) • No clinical improvement or worsening of the situation just before or during the transition to afebrile phase or as the disease progresses. • Persistent vomiting. • Severe abdominal pain. • Lethargy and/or restlessness, sudden behavioral changes. • Bleeding: epistaxis, black stool, haematemesis, excessive menstrual bleeding, dark colored urine (haemoglobinuria) or haematuria. • Giddiness. • Pale, cold and clammy hands and feet. • Less/no urine output for 4–6 hours • Liver enlargement > 2cm • Haematocrit >20%
CASE CLASSIFICATION	Negative Co-existing condition Social Circumstances Positive Negative Dengue without Warning Sign Positive Dengue without Warning Sign Severe Dengue
GROUP	Group A: May be sent home (Mild) Group B: Referred for Hospital Care (Moderate) Group C: Register for Emergency Treatment (Severe)
	GROUP A -Who may sent home Group B- Referred for in-hospital care Group C- Require emergency treatment
	Group criteria Patient Who do not have warning sign AND Who are able -to tolerate adequate amount of ORAL Fluids - to pass urine at least once in every 6 hours Group criteria Patients with any of the following features: • Co- existing conditions such as pregnancy infancy, old age, diabetes mellitus • Social circumstances such as living alone, living far from hospital OR Existing warning signs: • Abdominal pain or tenderness • Persistent vomiting • Clinical fluid accumulation • Mucosal bleeding • Lethargy/ restlessness • Liver enlargement >2cm • Laboratory: increase in Hct Group criteria Patients with any of the following features. Severe plasma leakage with shock and/or fluid accumulation with respiratory distress • Severe bleeding • Severe organ impairment • Severe Metabolic dysfunction
	Laboratory tests - Full Blood Count (FBC) - Hematocrit (HCT) Laboratory tests • Full blood Count (FBC) • Haematocrit (Hct) Laboratory tests • Full blood Count (FBC) • Haematocrit (Hct) • Other organ function tests as indicated

Advice for:	Treatment	Treatment
- Adequate rest - adequate fluid intake (> 6 glasses for an average-sized adult, or accordingly in children) - e.g. milk, fruit juice (caution with diabetes patient), oral rehydration solution (ORS) or barley/rice water/coconut water. Note: Plain water alone may cause electrolyte imbalance - Paracetamol (not more than 3 grams per day for adults; 10-15 mg/kg/dose, not more than 3 to 4 times in 24 hours in children) These patients will be advised to avoid - Acetylsalicylic acid (aspirin), mefenamic acid, ibuprofen or other NSAIDs - Steroids, Antibiotics Patients with stable Hct can be sent home Monitoring If any of following is observed, the patient should be immediately taken to the nearest hospital; these are warning signs for danger: Bleeding: - red spots or patches on the skin - bleeding from nose or gums - vomiting of blood - black-coloured stools - heavy menstruation/vaginal bleeding - Frequent vomiting or not able to drink - Severe abdominal pain - Drowsiness, mental confusion or seizures - Pale, cold or clammy hands and feet - Difficulty in breathing - Postural dizziness - No urine output for 4-6 hours - Daily review for disease progression: - Decreasing WBC - Defervescence - Warning signs (until out of critical period) - warning signs Written advice of management (eg, home care card for Dengue)	- Encouragement for oral fluids - If not tolerated, start in travenous fluid therapy 0.9% saline or Ringer Lactate at maintenance rate - Obtain reference Hct before fluid therapy - Give isotonic solutions such as 0.9% saline, Ringer lactate, start with 5-7 ml/kg/hr for 1-2 hours, then reduce to 3-5 ml/kg/hr for 2-4 hr, and then reduce to 2-3 ml/kg/hr or less according to clinical response Reassess clinical status and repeat Hct - If Hct remains the same or rises only minimally-> continue with 2-3 ml/kg/hr for another 2-4 hours - If worsening of vital signs and rapidly rising Hct -> increase rate to 5-10 ml/kg/hr for 1-2 hours Reassess clinical status, repeat Hct and review fluid infusion rates accordingly - Reduce intravenous fluids gradually when the rate of plasma leakage decreases towards the end of the critical phase This is indicated by: - Adequate urine output and/or fluid intake - Hct decreases below the baseline value in a stable patient Monitoring - Temperature pattern - Volume of fluid intake and losses - Urine output-volume and frequency Warning signs - Hct, white blood cell and platelet counts - Vital signs and peripheral perfusion (1-4) hourly until patient is out of critical phase - Urine output (4-6 hourly) - Hct (before and after fluid replacement, then 6-12 hourly) - Blood glucose - Other organ functions (renal profile, liver profile, coagulation profile, as indicated)	Treatment of compensated shock: - Start I.V. fluid resuscitation with isotonic crystalloid solutions at 5-10 ml/kg/hr over 1 hr - Reassess patient's condition If patient improves - I.V. fluids should be reduced gradually to 5-7 ml/kg/hr for 1-2 hr, then to 3-5 ml/kg/hr for 2-4 hr, then to 2-3 ml/kg/hr for 2-4 hr and then reduced further depending on haemodynamic status - I.V. fluids can be maintained for up to 24 - 48 hours If patient still unstable - Check Hct after first bolus - if Hct increases/still high (>50%), repeat a second bolus of crystalloid solution at 10-20 ml/kg/hr for 1 hr - If improvement after second bolus, reduce rate to 7-10 ml/kg/hr for 1-2 hr continue to reduce as above. If Hct decreases, this indicates bleeding and need to cross-match and transfuse blood as soon as possible Treatment of hypotensive shock - Initiate I.V. Fluid resuscitation with crystalloid or colloid solution at 20 ml/kg as a bolus for 15 min if patient improves - Give a crystalloid/colloid solution of 10 ml/kg/hr for 1 hr, then reduce gradually as above If patient still unstable - Review the Hct taken before the first bolus - If Hct was low (< 45% in adult males) this indicates bleeding, the need to crossmatch and transfuse (see above) - If Hct was high compared to the baseline value, change to I.V. colloids at 10-20 ml/kg as a second bolus over to 1 hour; reassess after second bolus - If improving reduce the rate to 7-10 ml/kg/hr for 1-2 hours, then back to I.V. crystalloids and reduce rates as above - If condition still unstable, repeat Hct after second bolus - If HCT decreases, this indicates bleeding, see above - If HCT increases/remains high (> 50%) continue colloid infusion at 10-20 ml/kg as a third bolus over 1 hr, then reduce to 7-10 ml/kg/hr for 1-2 hours, then change back to crystalloid solution and reduce rate as above treatment of haemorrhagic complications: - Give 5-10 ml/kg of fresh packed red cells or 10-20 ml/kg fresh whole blood
Discharge Criteria: All of Following criteria must be present - No fever for 48 hours - Improvement in clinical picture - Increasing trend of platelet count - No respiratory distress - Stable haematocrit without intravenous fluids		

Table 1 - Dengue Case Management Algorithm

Treatment According to Group B

The general principles of fluid therapy in DHF include the following:

- Isotonic crystalloid solutions should be used throughout the critical period except in the very young infants <6 months of age in whom 0.45% sodium chloride may be used. Give only isotonic solutions such as 0.9% saline, Ringer's lactate or Hartmann's or Lactate solution.
- Hyper-oncotic colloid solutions (osmolarity of >300 mOsm/l) such as dextran 40 or starch solutions may be used in patients with massive plasma leakage, and those not responding to the minimum volume of crystalloid. Iso-oncotic colloid solutions such as blood and blood component may not be as effective.
- A volume of about maintenance +5% dehydration should be given to maintain "just adequate" intravascular volume and circulation. The duration of intravenous fluid therapy should not exceed 24 to 48 hours for those with shock. However, for those patients who do not have shock, the duration of intravenous fluid therapy may have to be longer but not more than 60 to 72 hours. This is because the latter group of patients has just entered the plasma leakage period while shock patients have experienced a longer duration of plasma leakage before intravenous therapy is begun.
- In obese patients, the ideal body weight should be used as a guide to calculate the fluid volume
- Fluid Requirement: The fluid requirement, both oral and intravenous, in critical phase (48 hours) is calculated as M+5% (maintenance + 5% deficit). 5% deficit is calculated as 50 ml/kg up to 50kg

Calculations for normal maintenance of intravenous fluid infusion:

Normal maintenance fluid per hour can be calculated on the basis of the following formula (equivalent to Holliday - Segar formula):

4 ml/kg /hr for first 10 kg body weight

+2 ml/kg/hr for next 10 kg body weight

+1 ml/kg/hr for subsequent kg body weight

*For overweight/obese patients calculate normal maintenance fluid based on ideal body weight (IBW), using the following formula:

Height (cm)	Estimated IBW for adult male(kg)	Estimated IBW for adult female(kg)
150	50	45.5
160	57	52
170	66	61.5
180	75	70

Table 2 - Estimated ideal body weight for overweight or obese adults

Ref: 1. <https://www.cdc.gov/dengue/healthcare-providers/testing/testing-guidance.html>

2. https://brazil.drclos.harvard.edu/files/drclosbraziloffice/files/lecture_5_-_simmons_farrar_dengue_current_concepts_2012_nejm.pdf

3. https://www.iedcr.gov.bd/sites/default/files/files/iedcr.portal.gov.bd/miscellaneous_info/4a952c51_1886_4531_bc78_5632216d9e0a/2023-02-12-06-49-8f0ac00e59a396a410702e913fd2f1ee.pdf

Ideal wt (kg)	Maintenance (ml)	M+5% deficit (ml)	Ideal body wt (kg)	Maintenance (ml)	M+5% deficit (ml)
5	500	750	35	1800	3550
10	1000	1500	40	1900	3900
15	1250	2000	45	2000	4250
20	1500	2500	50	2100	4600
25	1600	2850	55	2200	4950
30	1700	3200	60	2300	5300

Table 03 - Requirement of fluid based on ideal body weight

Note	Children (ml/kg/hr)	Adult(ml/hr)
Half of maintenance (M/2)	1.5	40-50
Maintenance	3	80-100
M+5% deficit	5	100-120
M+7% deficit	7	120-150
M+10% deficit	10	300-500

Table 04 - Rate of IV fluid in adults and children

- In general, the fluid allowance (oral + IV) is about maintenance (for one day) + 5% deficit (oral and IV fluid together), to be administered over 48 hours. For example, in a child weighing 20 kg, the deficit of 5% is 50 ml/kg x 20 = 1000 ml. The maintenance is 1500 ml for one day. Hence, the total of M + 5% is 2500 ml. This volume is to be administered over 48 hours in non shock patients. The rate of IV replacement should be adjusted according to the rate of plasma loss, guided by the clinical condition, vital signs, urine output and haematocrit levels.
- The admitted patient (Category B) should be started with recommended fluid at a rate of 1.5ml/kg/hr or 40ml/hr (12 d/min) for adults and should be given for 6 hours. If patient's vital signs are stable, then the escalation of fluid is not needed and the same rate can be maintained for a period of 48 hours.
- If patient started with 1.5ml/kg/hr (adult 40ml/hr) for 6 hours doesn't have stable vital signs and adequate urine output, the fluid should be escalated to 3ml/kg/hr (adult 80ml/hr or 20 drops/min) for another 6 hours. If patient's vital signs are stable, then the escalation of fluid is not needed and the same rate can be maintained for a period of 48 hours. This fluid can be escalated to 5ml/kg/hr (adult 120ml/hr or 30d/min) and then upto 7ml/kg/hr or adult 200ml/hr or 50d/min) if every 6 hours doesn't have stable vital sign or urine output.
- Patient should be monitor every 2 hours with special attention to vital signs, urine output, respiratory signs and haematocrit etc. In 6 hours of escalation, if patient become stable regarding clinical parameters, the fluids can be gradually decline from 7 to 5 to 3 to 1.5 (ml/kg /hr) or from stages where he was stable. But the fluids should be maintained always for at least 48 hours.

Pacemaker Therapies in Cardiology

Dr Ake Senning implanted the first cardiac pacemaker into Arne Larson in 1958. The device in 1958 only lasted 3 hours and had to be replaced with a second device. The initial indication for a pacemaker was for the treatment of bradycardia. Pacemakers are now also used to treat tachycardias, patients at risk of sudden cardiac death (implantable defibrillators), and cardiac failure (cardiac resynchronisation devices). Devices have evolved from single lead systems and fixed rate systems to multichamber, rate responsive systems with increasingly sophisticated software systems.

Pacemaker technology

The pacing system consists of the pacemaker (or pulse generator) and a lead or leads that connect to the pacemaker. This is all located inside the other important part of the pacing system, the patient. There is a desk based programmer to communicate with the device.

Pacemaker (pulse generator)

This is like a mini computer. It contains a tiny 2.5 volt lithium-iodine battery capable of long battery longevity. It also contains the complex circuitry capable of

performing functions from delivering the pacing impulse, sensing the intracardiac signal to storing, filtering and analysing intracardiac signals. This is all hermetically sealed in a hard titanium based case. Pulse generators now weigh only about 20 g and are ~20 cc in size (Figure 1).

Pacing leads

These are predominately transvenous and consist of an insulated wire (silicone or polyurethane covering) that conveys electrical signals between the heart and back to the pacemaker. It connects to the pacemaker by a port and connects to the heart by a fixation mechanism. This is either a tine or screw mechanism (Figure 2).

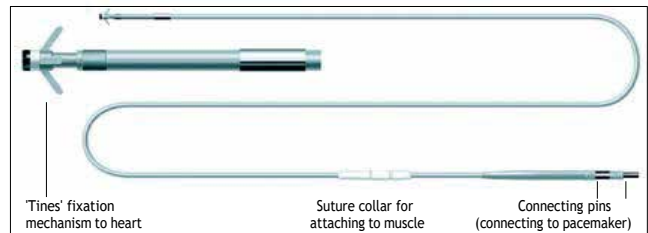


Figure 2. Pacing lead
Reproduced with permission: Boston Scientific Corporation

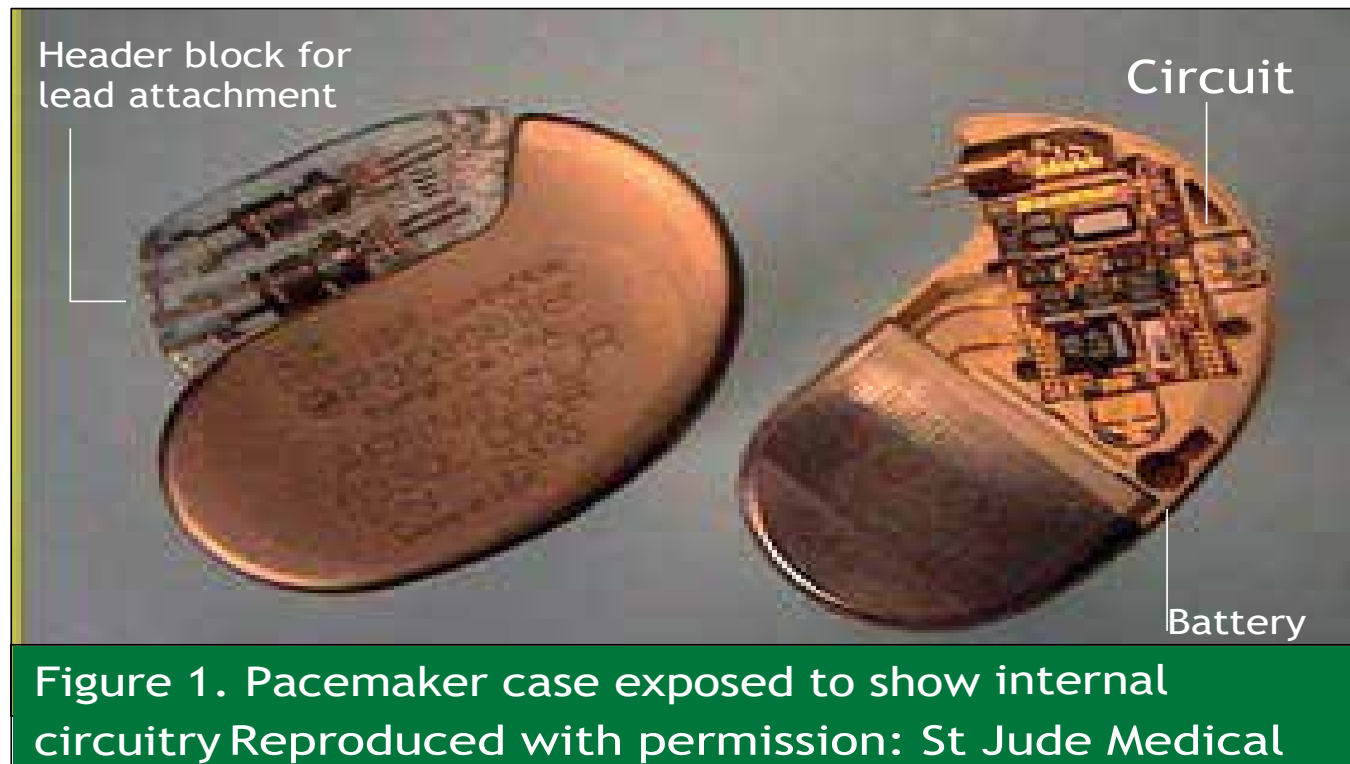


Figure 1. Pacemaker case exposed to show internal circuitry
Reproduced with permission: St Jude Medical

Pacing implant

In the early days, pacemakers were inserted by a thoracotomy, however they are now nearly all inserted by the transvenous approach. This is achieved by a small incision under the clavicle to access the cephalic or subclavian vein (Figure 3). The leads are then advanced into the heart and fixed by either small tines (or hooks) or screwed into the myocardium (Figure 4). The leads are then connected to the pacemaker header block and the device implanted in a prepared pocket in the prepectoral region. This procedure typically involves an overnight stay in hospital. Pacemaker generator changes can usually be performed as day procedures.

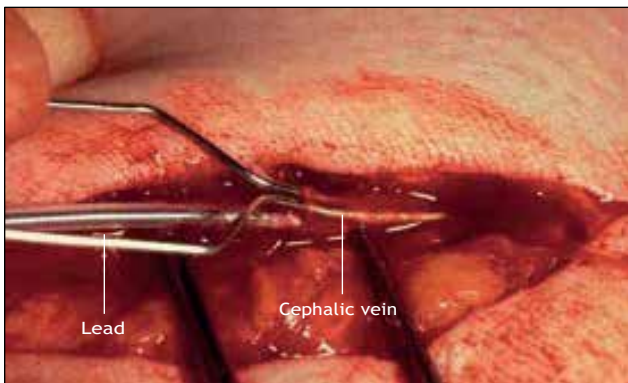


Figure 3. Lead entering cephalic vein
Reproduced with permission: St Jude

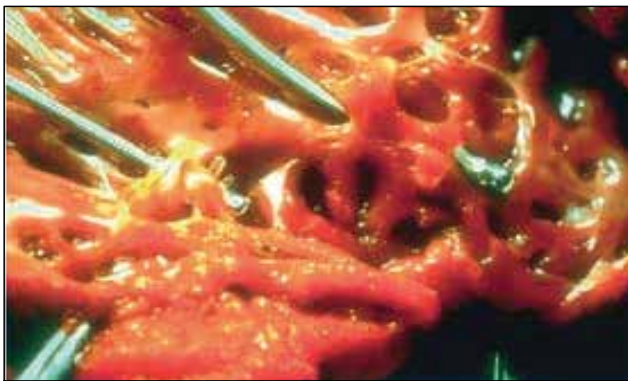


Figure 4. Leads attached to
trabeculae via tines
Reproduced

Indications

The decision to implant a pacemaker in some cases is clear, **but in others involves the weighing up of a number of factors including:**

- clinical symptoms such as syncope, light headedness, dizziness, confusion, fatigue, reduced exercise tolerance
- drug treatment (where required and produces bradycardia)

- comorbid conditions
- reversibility of the condition
- drug toxicity (ie. digoxin).

Ultimately however, it is the presence of symptoms and associated documented bradycardia that is crucial in the decision to implant a device. To aid in the decision making, guidelines have been issued by the American College of Cardiology, American Heart Association, the Heart Rhythm Society, the European Society of Cardiology, and the European Heart Rhythm Association. **These guidelines classify patients into groups and provide evidence based decision making for particular conditions. These are:**

- **class I:** conditions where there is general agreement that a pacemaker should be inserted
- **class II:** conditions where there is no such agreement. This is divided into those where the weight of evidence supports the implantation (IIA) and those in which its usefulness is less well established (IIB)
- **class III:** conditions where there is general agreement that a device is not required or may be harmful.

Sinus node dysfunction

Sinus node dysfunction (sick sinus syndrome) is a condition characterised by a spectrum of arrhythmias: sinus bradycardia, sinus pauses, atrial fibrillation, atrial flutter and paroxysmal supraventricular tachycardia.

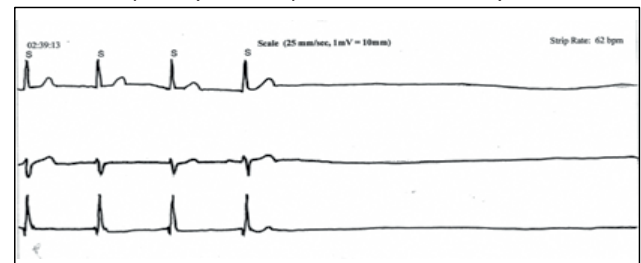


Figure 5. ECG showing sinus arrest

Clinical symptoms can result from both the tachycardia and the bradycardia, and it is important to correlate these to the arrhythmias. It is a leading reason for a cardiac pacemaker. **The guidelines for pacemakers in this condition are shown in Table 1.**

Table 1. Pacing for sinus node dysfunction

Pacing required (class I)
Documented symptomatic bradycardia
Documented symptomatic bradycardia secondary to medications not able to be modified
Pacing probably required (class II)
Bradycardia with symptoms but no clear correlation of symptoms to bradycardia

Heart block

A block in the atrioventricular (AV) conduction system is the second common reason for cardiac pacing. **Heart block is classified into:**

- **first degree AV block** – typified by prolonged PR interval (0.20 msec)
- **second degree AV block (Figure 6)** – this is divided into two groups: Mobitz I (Wenchebach block) and Mobitz II. **Mobitz I** is manifested by progressive prolongation of the PR interval with a dropped QRS (beat). It generally involves block in the AV node and tends not to present with syncope.

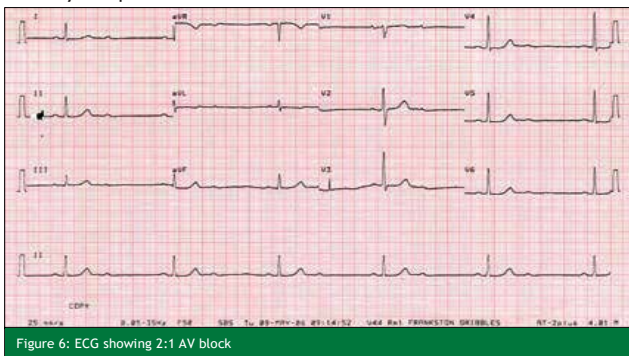


Figure 6: ECG showing 2:1 AV block

Mobitz II is typified by a constant PR interval before a dropped QRS (dropped beat). The association of a wide QRS it typically involves block in the infranodal system. This is a less stable rhythm and therefore more likely to present with symptoms such as syncope

- **complete heart block** – typified by the absence of all AV conduction or dissociated P waves from the QRS (Figure 7). The patient is generally symptomatic and has either symptoms of reduced cardiac output or syncope.

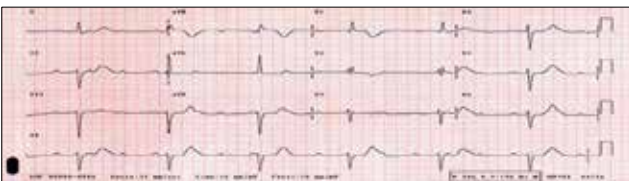


Figure 7: ECG showing complete heart block

The decision to implant a pacemaker in AV block is strengthened by the presence of symptoms (Table 2).

Table 2. Pacing for AV block^a

Pacing required (class I)

- Symptomatic complete AV block
- Asymptomatic complete AV block
- Symptomatic second degree AV block regardless of level
- Asymptomatic second degree AV block with wide QRS

Pacing probably required (class II)

Table 2. Pacing for AV block^a

- Asymptomatic type II AV block (with narrow QRS)
- Asymptomatic type I AV block with low escape
- Pacing not required (class III)**
- First degree AV block

Choice of device

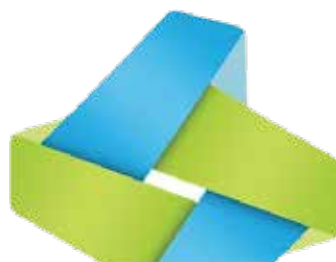
The decision over the type of device (dual or single chamber device) rests upon the desire to maintain AV synchrony (and hence normal physiology).

Conclusion

Since the first pacemaker was inserted in 1958 vast changes have occurred in both the technology of devices and their indications. Devices have evolved from simple single chamber devices to multichambered devices capable of treating not only bradycardias but also tachycardias and heart failure. The decision to insert a pacemaker is usually based on the presence of a documented symptomatic bradycardia. International guidelines are available classifying conditions from class I, in which pacing is clearly beneficial for symptom control and prognosis to class III, in which pacing is not indicated and may potentially be harmful. The most common indications are for sick sinus syndrome and heart block. Patients need to attend regular follow up, and although they need to be aware of precautions relating to electromagnetic fields, they can go about their daily lives with little interference.

References:

1. Geoffrey Toogood, MBBS, FRACP, FCSANZ, is a cardiologist, Pacemaker Clinic, Department of Cardiology, Alfred Hospital, Melbourne, Victoria. gdtoogood@ozemail.com.au.
2. Gregoratos G, Abrams J, Epstein AE, et al. ACC/AHA/NASPE 2002 guideline update for implantation of cardiac pacemakers and antiarrhythmia devices: summary article. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (ACC/AHA/NASPE Committee to Update the 1998 Pacemaker Guidelines). Circulation 2002;106:2145–61.
3. Reiffel JA. Sinus node function and dysfunction. In: Podrid PJ, Kowey PR, editors. Cardiac arrhythmias mechanisms, diagnosis and management 2nd edn. Baltimore: Lippincott, Williams, Wilkins, 2001.
4. Reprinted from Australian Family Physician Vol. 36, No. 7, July 2007



MRCP UK



Dear Intern Doctors,

Congratulations! You have completed your MBBS course; it is the high time to prepare yourselves for further study. You know MRCP (UK) is a well-recognized medical degree all over the world. So, you can take an effort to prepare yourselves for MRCP Part 2. Biopharma Limited wants to be a proud partner in your effort. We will publish detailed information about MRCP part by part.

Wishing all of you a safe, healthy and peaceful life.

INTRODUCTION

MRCP(UK) examinations

The MRCP(UK) Diploma and Specialty Certificate Examinations are designed to test the skills, knowledge and behaviour of doctors in training. It has three parts:

- MRCP(UK) Part 1
- MRCP(UK) Part 2 Written
- MRCP(UK) Part 2 Clinical (PACES).

Part 2

The MRCP(UK) Part 2 written exam can be taken by physicians in training who have passed the MRCP(UK) Part 1 exam. It builds on the knowledge assessed in Part 1 and tests the acquisition of a representative sample of medical knowledge, skills and behaviour as specified in the UK Specialty Training Curriculum for Core Medical Training Link ([https://www.mrcpuk.org/sites/default/files/documents/2009-CMT-Curriculum-\(Amended%20Aug%202013\).pdf](https://www.mrcpuk.org/sites/default/files/documents/2009-CMT-Curriculum-(Amended%20Aug%202013).pdf)) / Curriculum for

Internal Medicine (Link https://www.jrcptb.org.uk/sites/default/files/IM_Curriculum_Sept2519.pdf). Since 2018, the exam now consists of two, three hour papers each with 100 questions. for more information – Link (<https://www.mrcpuk.org/mrcpuk-examinations/faqs>). The exam will test your ability to apply clinical understanding, make clinical judgements and take responsibility for:

- prioritising diagnostic or problem lists
- planning investigation
- selecting a plan for immediate management
- selecting a plan for long-term management
- assessing prognosis.

The exam at a glance

- two papers taken on one day
- papers last three hours
- 100 multiple choice questions per paper
- questions include images
- sat in an examination hall.

Applications

To apply and find out when the exams run:

- Dates and fees
- Apply online

Exam dates and fees

Applications made outside the opening and closing dates will not be accepted. All UK exams are online (Link : <https://www.mrcpuk.org/mrcpuk-examinations/part-2/uk-online-exam>). The online exam is only available to UK-based candidates, international candidates in a

Federation Training Programme, and trainees based in Malaysia.

- To find out how to apply online watch video(link: <https://www.mrcpuk.org/mrcpuk-examinations/part-1/how-complete-your-application>).

International examination centres for Bangladesh (Dhaka)

	2023/1	2023/2	2023/3	2023/4	Exam fee
Application period	21 November - 28 November 2022	13 March - 20 March 2023	03 July - 10 July 2023	18 September - 25 September 2023	£460(UK) £616(Int.)
Exam date	22 February 2023	17 May 2023	06 September 2023	22 November 2023	
	2024/1	2024/2	2024/3	2024/4	Exam fee
Application period	04 December-11 December 2023	18 March-25 March 2024	08 July-15 July 2024	16 September-23 September 2024	£460(UK) £616(Int.)
Exam date	21 Feb 2024	15 May 2024	11 Sep 2024	20 Nov 2024	

Email updates

Sign up (link: <https://www.mrcpuk.org/examinations-updates>) for more information on application periods as well as info/tips on revision/preparation resources and more.

How to complete your application

Online application

Apply online through My MRCP(UK). The main steps are:

- Log into your My MRCP(UK) account
- Check that all your personal details are up-to-date
- Fill in details about whether you are training in the UK or not
- Choose a centre where you would like to take the exam
- Complete any special arrangements(link: https://www.mrcpuk.org/glossary/letter_s#Special_arrangements) where applicable as the details will not still be on the system from a previous exam
- Pay for the exam.

If you are unable to make an application online, please contact the team and request for a paper application form. Previously saved or stored paper applications will not be accepted.

Completing your application

When you apply for the Part 2 exam your application may be incomplete (link: https://www.mrcpuk.org/glossary/letter_i#Incomplete_status) for one of the reasons below.

1) Fee payment

Follow the guide to make payment attempt online via your MyMRCP account using a credit/debit card:

How to pay online via MyMRCP account

If you are unable to pay via MyMRCP account, contact the central office. You may be able to make a payment over the phone. You will need to provide the 16 digit card number, expiry date (month/year) and the 3 digit security code (on the back of the card). Payments will be processed using a secure payment system and card details will not be stored by MRCP(UK).

In order to comply with UK law we cannot accept credit/debit card details sent in emails/via the contact

form on this website, either in the body text or as attachments. If you do send card details in this manner it is entirely at your own risk. Card details received in emails or as attachments will be immediately deleted and payments will not be actioned. Card payment can only be made online via the application system or by telephone.

2) Declaration form

Candidates with constraints on their practice should complete an online declaration form (link: <https://www.mrcpuk.org/mrcpuk-examinations/regulations/candidates-constraints-their-practice>) as soon as possible.

For further information regarding reasonable adjustments link: (<https://www.mrcpuk.org/reasonable-adjustments>).

Ref: <https://www.mrcpuk.org>

Medi Quiz (20th Edition)

- Write WHO criteria for dengue hemorrhagic fever (DHF).
- What is capillary refill time?
- Write dengue case classification by severity.



An effective antipyretic for Dengue management

Aceta (Paracetamol) Family

- Aceta Tablet
- Aceta Extend 665 mg Tablet
- Aceta One Tablet
- Aceta-X Tablet with Caffeine
- Aceta-T Tablet with Tramadol
- Aceta 60 ml & 100 ml Suspension
- Aceta Pediatric Drops



Resuscitation: Hospital Management of Cardiopulmonary Arrest for Infants & Children

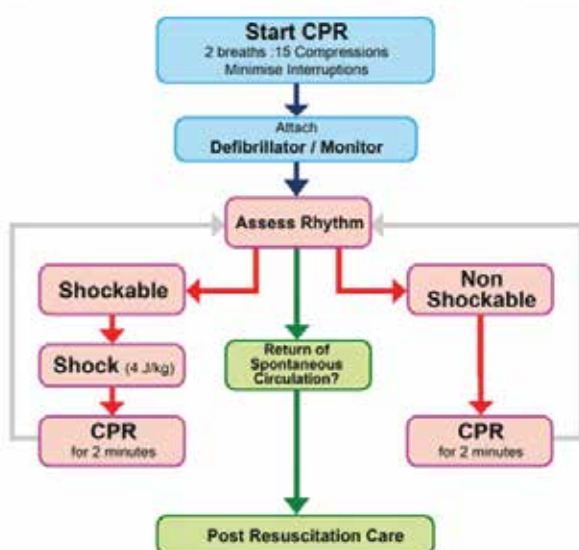
Background

1. The majority of arrests in children are due to hypoxia, hypotension and acidosis
2. The most common dysrhythmias are severe bradycardia and asystole
3. Ventricular fibrillation (VF) is the initial arrest rhythm in approximately 10%
4. Traumatic cardiac arrest is a unique situation - the management is different to non-traumatic cardiac arrest and is not covered by this CPG

Cardiac arrest should be suspected in an infant or child who is unresponsive and not breathing normally – pulse check should not delay cardiopulmonary resuscitation (CPR).

Resuscitation

Advanced Life Support for Infants and Children



B – Breathing

- Look for chest rise and fall and auscultate
- Commence artificial ventilation with self-inflating bag-valve-mask or anaesthetic t-piece using 100% oxygen
- Consider oro/nasopharyngeal airway for upper airway obstruction
- Consider 2-person technique for poor mask seal
- Intubation should be considered for persistent obstructed airway or at some stage during CPR

*If available, continuous wave-form end-tidal CO₂ monitoring, should be used to:

- Warn of accidental extubation during CPR
- Monitor for return of spontaneous circulation
- Ensure adequacy of ventilation

C - Circulation

- If no signs of life continue CPR
- If signs of life assess pulse

- Palpate central pulse (brachial, femoral, carotid)
- Assessment of pulse can be difficult and inaccurate
- If no pulse, slow pulse (<60 in an infant) or unsure, continue CPR
- Determine the cardiac rhythm: shockable or non-shockable

(see Advanced Life Support flow chart above)

Technique

External cardiac compression

- CPR rate for all ages 100–120 bpm
- Ratio for CPR is 2 breaths : 15 compressions
- Once patient intubated compressions and breaths are independent of each other: compressions continue at rate 100–120 bpm and breaths at rate of 10 bpm

Assess for signs of life or response; if they are absent commence CPR

A – Airway

- Look, listen, feel for patency/added noises
- Optimise head position
- Consider simple airway manoeuvres (head-tilt chin-lift or jaw thrust)
- Suction secretions/blood/vomit

- Place the child on a firm surface. If on a bed, place the cardiac compression board under the patient, not under the mattress
- Perform external cardiac compressions to the lower half of the sternum in all patients including newborns
- Compress sternum 1/3 the depth of the chest
- Use the hand technique that allows you to achieve this:



Fig.: A

For newborn infants the best technique is a two-handed hold in which both thumbs compress the sternum



Fig.: B

For infants two fingers may be used



Fig.: C

For small children use the heel of one hand



Fig.: D

For larger children use the "heel" of one hand with the other superimposed

DO NOT interrupt CPR except for rhythm check or defibrillation

Defibrillator operator instructions:

"HANDS OFF" – pad placement or DC shock – "Continue CPR" – "HANDS ON"

For rhythm check consider **"COACHED"**

Continue CPR

Oxygen away

All clear

Charge

Hands off

Evaluate rhythm

Defibrillate or 'dump charge'

- Frequent changes of cardiac compression personnel (every few minutes) is desirable
- Continue CPR until the next designated rhythm check
- Gain IV access as soon as possible
- Consider intraosseous access early

If DC shock delivered, **recommence CPR immediately** for 2 minutes prior to rhythm check

During resuscitation

Correct treatable causes

- Hypoxaemia
- Hypovolaemia
- Hypo/hyperthermia
- Hypo/hyperkalaemia
- Tamponade
- Tension pneumothorax
- Toxins/poisons/drugs
- Thrombosis

Other considerations during resuscitation

- Aim for normal glucose

Ref.: https://www.rch.org.au/clinicalguide/guideline_index/Resuscitation__Hospital_Management_of_Cardiopulmonary_Arrest/

- Aim for normal carbon dioxide (CO₂)
- Aim for normal temperature
- Toxin induced cardiac arrest requires urgent consultation with National Poisons Centre
- Resuscitation for toxin induced cardiac arrest and cardiac arrest following cold-water drowning may be prolonged

Medications for paediatric arrest

Drug	Dose	Indication
Adrenaline 1:10,000	10 microgram/kg = 0.1 mL/kg IV/IM/IO	• Shockable and non-shockable cardiac arrest path • Non vagus-induced bradycardia
Amiodarone	5 mg/kg IV/IO	Shock resistant ventricular fibrillation or pulseless ventricular tachycardia

Atropine, lidocaine, sodium bicarbonate and calcium are only considered in specific situations

Post resuscitation care - following return of spontaneous circulation

- Re-evaluate ABCD
- Ensure airway and breathing are managed effectively, including intubation if not already performed; do not extubate
- Titrate inspired to achieve normal saturations, avoid excessive oxygenation
- Ventilate to normal CO₂
- Perform CXR to confirm ETT in desired position and check for complications of CPR (pneumothorax, rib fractures, aspiration)
- Maintain normal blood pressure appropriate for age with use of inotropes as needed
- Perform 12 lead ECG
- Monitor for further arrhythmias and consider ongoing anti-arrhythmic medication
- Consider echocardiography to monitor contractility and exclude tamponade
- Check haemoglobin, pH, electrolytes and glucose and correct as necessary
- Aim for normal temperature (avoid hypo/hyperthermia)
- Use adequate sedation and analgesia

Withdrawal of CPR

The decision to withdraw CPR in children is difficult and must involve experienced senior clinicians who will consider the clinical context and the desires of patient and family

Family and staff support

Family members of patients undergoing resuscitation should be given the option to be present, ideally with an assigned support person.



Who's Who Bangladesh Award Winner Program held on 3rd January 2023; 13 different sectors received the Award. Our Hon'ble Deputy Managing Director **Dr. Lokiat Ullah** presents a bouquet to H.E. Dr Muhammad Hasan Mahmud, Minister of Information and Broadcasting. **Dr. Muhammad Hasan Mahmud** wishes continuous success for Biopharma Limited.



Dr. Lokiat Ullah is shaking hand with Muhammad Abdul Mannan, Hon'ble Minister, Ministry of Planning at Iftar party, in Dhaka.



Dr. Lokiat Ullah is with Mr. AKM Mozammel Haque, Hon'ble Minister for Liberation War Affairs & Mr. Ashraf Ali Khan Khasru, Hon'ble State Minister of Social Welfare at Iftar Party, in Dhaka.



Dengue Awareness on 07 August, 2023 at Green Heights, Green Hall Chinese Restaurant, Main Road Majdee, Noakhali.



Dr. Lokiat Ullah, Deputy Managing Director, Biopharma Ltd. is greeting newly appointed Director General, DGDA Mr. **Mohammad Yousuf** (Major General).



STEP UP FOR NASH- Public Awareness Rally; 6th International NASH Day, 2023. **Professor Dr. Mubin Khan** (President of Hepatology Society), **Major General Professor Dr. A S M Matiur Rahman** Rtd and General Secretary of Hepatology Society Bangladesh Professor **Dr. Md. Shahinul Alam** Sir were also present.



Doctors' Get Together on 13 June, 2023 at DESHA TARC, Upozila more, Kushtia.



APB conference, 21st May 23, at Hotel Intercontinental, Dhaka.
Dr. Nahiduzzaman FCPS, BSMMU.



Dr. Lohiat Ullah, Deputy Managing Director, Biopharma Ltd. and Dr. Mashfika Ashraf (Associate Professor, Department of Sociology, BOU) are with Dr. Shirin Sharmin Chowdhury, Honorable Speaker of the Government of the People's Republic of Bangladesh, the chief guest of 20th anniversary event of Bangladesh Malaysia Chamber of Commerce and Industries (BMCCI) held at Hotel Radisson Blu, Dhaka.



Eid reunion programs were held in Sylhet in the presence of renowned specialist doctors. Biopharma board of directors were present on the occasion. In the presence of all, the events turned into a meeting fair. Heartfelt gratitude and greetings from Biopharma to all the doctors coming for 'Eid Reunion'.



"The 7th International Hepatology Conference" was held on 24th November 2022 at Pan Pacific Sonargaon Hotel, Dhaka. Dr. Shahinul Alam, Professor, Department of Hepatology, BSMMU, visited "Biopharma Stall". We are proud to participate in this program.



"Public Awareness Related Round Table Discussion" was organized by Hepatology Society of Dhaka, Bangladesh. In this round table discussion renowned Hepatologist of the subcontinent Professor Dr. Mubin Khan was present, President of Hepatology Society and Major General Professor Dr. A S M Matiar Rahman Rtd. were also present as a special guest. General Secretary of Hepatology Society Bangladesh Professor Dr. Md. Shahinul Alam Sir was also present.

Top Medical Innovations

THE FIRST CURE FOR HYPERTROPHIC CARDIOMYOPATHY

Hypertrophic cardiomyopathy is a heart condition characterised by the thickening of the organ muscle. The standard treatment of the disease was symptomatic combination therapy – a combination of beta-blockers, antiarrhythmic drugs and other medicines that relieve the symptoms. In particularly dangerous cases, patients may require surgery. In 2022, patients diagnosed with hypertrophic cardiomyopathy have a new treatment option, **the drug Mavacamten, which is the only one to show positive progress in treating the disease for many years.** This drug targets the cause of the disease itself – it reduces abnormal muscle contractions caused by genetic mutations. This eliminates the symptoms, improves the physical and social functioning of the patient and his/her quality of life; and avoids the unwanted side effects of taking large amounts of medication.



A NEW TREATMENT FOR PROSTATE CANCER – PSMA-TARGETED THERAPY

Prostate-specific membrane antigen is a protein that is found in large quantities in prostate adenocarcinomas. It represents an ideal target for the diagnosis and treatment of this disease.

PET-CT with PSMA and SPECT with PSMA has become the most widely used technologies. They are much more accurate than conventional imaging techniques in detecting tumours at all stages of the disease, including the metastatic one. **One** of the most promising treatment options for prostate cancer is



considered to be **targeted therapy with Lutetium-177.** This is a drug made up of several components. One of these has a high sensitivity to the PSMA protein mentioned above, which allows it to detect

cancerous foci in any part of the body. The second component is a tiny dose of the radioactive element Lutetium-177, which can destroy cancer cells. Interim studies show that this therapy is effective in 80% of cases.

NEW CURE FOR AMYOTROPHIC LATERAL SCLEROSIS AN IMPLANT THAT ALLOWS PARAPLEGIC PATIENTS TO STAND ON THEIR FEET

The most common cause of total loss of the ability to walk is a

spinal injury. The connection between the brain and the body is damaged and patients are confined to a hospital bed. Restoring mobility requires long-term work with a physiotherapist and a great deal of effort on the part of the patient. **However,** this may change with the creation of an intervertebral implant developed by a medical team at the Swiss Federal Institute of Technology. They have created a small device that helps transmit an electrical impulse between damaged neural pathways. **Such stimulation retrains the damaged nerve networks in the spinal cord to receive and interpret the signals coming from the brain that persist after a spinal cord injury.** This

allows patients even with complete paralysis to partially regain sensation and mobility in their lower limbs. **The FDA has given this invention 'breakthrough device' status.** This usually indicates that it will be approved sooner than usual.



CRISPR – GENE EDITING

Clustered regularly interspaced short palindromic repeats, CRISPR for short is a genome editing technology that cuts DNA sequences at specific locations to alter them by removing an old sequence or inserting a new one. The technology can also be used to 'turn on' or 'turn off' genes without disrupting their sequences. **This method of treating genetic diseases has been "inspired" by bacteria which use a similar mechanism to counteract viral infections.** The ability to edit



genes has already met success in experiments on plants, animals, and human tissue. And in 2018, news spread

about the first 'genetically modified' babies from China. **The tireless** work of refining CRISPR technology is making it increasingly accurate and

safe. Although genetic editing is far more reliable than classical selectionism, it is still not as accurate as we would like it to be. Gene cutting often does not go according to plan and unforeseen mutations are created as a result. Researchers at the **Massachusetts Institute of Technology** have been able to solve this problem. They have developed a new variant of CRISPR called PASTE. It is used to replace large sections of DNA and avoids unwanted damage to the genetic code.

DRUG TO DELAY THE ONSET OF TYPE 1 DIABETES

The U.S. Food and Drug Administration (FDA) approved **Tzield (teplizumab-mzwv)**, the first drug that could delay the onset of type 1 diabetes. Tzield, developed by Provention Bio, Inc., is available to adults and children aged 8 and older with stage 2 type 1 diabetes. The drug works by binding to certain immune system cells and delaying progression to stage 3 type 1 diabetes. Tzield may deactivate the immune cells that attack insulin-producing cells, simultaneously increasing the proportion of cells that help moderate the immune response.



A SINGLE X-RAY TO PREDICT HEART DISEASE

Researchers have developed a deep learning model, known as CXR-CVD risk, that uses a **single chest X-ray to predict the 10-year risk of death from a heart attack or stroke** caused by atherosclerotic cardiovascular disease.



HIV VACCINE THAT INDUCES IMMUNITY RESPONSE

Scientists have been unsuccessfully trying to create an HIV vaccine since 1987. However,

researchers at **Scripps Research Institute** may be close to it, as their **HIV vaccine candidate induced antibodies against the disease in 97%** of participants in Phase 1 clinical trial. The researchers in the study use a strategy known as "germline targeting," where the production of desired broadly neutralizing antibodies is launched by stimulating the right antibody-producing cells.

SEBUM TEST FOR PARKINSON'S DISEASE

A **non-invasive skin test may help to diagnose Parkinson's disease in as little as 3 minutes**, the study from the **University of Manchester** suggests.

The test examines samples of sebum, an oily secretion from sebaceous glands under the skin which are connected to the endocrine system. In the study, the sebum was collected from the upper back of patients in the clinics and mailed to the lab. When analyzing sebum samples, researchers found 500 compounds that are different between people with Parkinson's disease compared to the control participants.



The study authors say this test has the potential to improve the diagnosis of Parkinson's disease significantly.

FIRST LAB-GROWN RED BLOOD CELLS TRANSFUSION

For the first time, researchers transfused **laboratory-grown red blood cells into a human recipient in 2022**. Two participants in the randomized controlled clinical trial received around 5-10mls of lab-grown cells, and no untoward side effects were reported.

Researchers say it is the first step towards creating blood from stem cells outside the living human body.

The technology could significantly improve the care of people with diseases that require frequent red blood cell transfusions, **such as beta-thalassemia or sickle cell disease, and people with rare blood groups**.

DAXXIFY, A COMPETITOR TO

BOTOX

Another anti-wrinkle drug entered the market when the **FDA** approved

neuromodulator Daxxify

(daxibotulinumtoxinA-lanm). The drug aims to treat moderate-to-severe glabellar (frown) lines in adults and is administered by an injection into the face.



1.Ref: <https://mediglobus.com/top-medical-innovations-2022/>

2.Ref: <https://healthnews.com/news/top-medical-innovations-of-2022/>



Novel Drug Approvals by FDA for 2023*

No.	Drug Name	Active Ingredient	Approval Date	FDA-approved use on approval date*
35.	Veopoz	pozelimab-bbfg	8/18/2023	To treat patients 1 year old and older with CD55-deficient protein-losing enteropathy (PLE), also known as CHAPLE disease
34.	Sohonos	palovarotene	8/16/2023	To reduce the volume of new heterotopic ossification in adults and pediatric patients (aged 8 years and older for females and 10 years and older for males) with fibrodysplasia ossificans progressiva
33.	Elrexio	elranatamab bcmm	8/14/2023	To treat adults with relapsed or refractory multiple myeloma who have received at least four prior lines of therapy
32.	Talvey	talquetamab-tgvs	8/9/2023	To treat adults with relapsed or refractory multiple myeloma who have received at least four prior therapies
31.	Zlervay	avacincaptad pegol	8/4/2023	To treat geographic atrophy secondary to age-related macular degeneration.
30.	Zurzuvae	zuranolone	8/4/2023	To treat postpartum depression
29.	Xdemvy	lotilaner	7/25/2023	To treat Demodex blepharitis
28.	BVanflyta	quizartinib	7/20/2023	To use as part of a treatment regimen for newly diagnosed acute myeloid leukemia that meets certain criteria
27.	Beyfortus	nirsevimab-alip	7/17/2023	To prevent respiratory syncytial virus (RSV) lower respiratory tract disease
26.	Ngenla	somatrogon-ghla	6/27/2023	To treat growth failure due to inadequate secretion of endogenous growth hormone
25.	Rystiggo	rozanolixizumab-noli	6/26/2023	To treat generalized myasthenia gravis in adults who are anti-acetylcholine receptor- or anti-muscle-specific tyrosine kinase antibody-positive
24.	Litfulo	ritlecitinib	6/23/2023	To treat severely patchy hair loss
23.	Columvi	glofitamab-gxbm	6/15/2023	To treat diffuse large B-cell lymphoma, not otherwise specified, or large B-cell lymphoma arising from follicular lymphoma after two or more lines of systemic therapy
22.	Inpefa	sotagliflozin	5/26/2023	To treat heart failure
21.	Posluma	flotufolastat F-18	5/25/2023	To use with positron emission tomography imaging in certain patients with prostate cancer
20.	Paxlovid	nirmatrelvir, ritonavir	5/25/2023	To treat mild-to-moderate COVID-19 in adults at high risk for progression to severe COVID-19 Press Release
19.	Xacduro	sulbactam, durlobactam	5/23/2023	To treat hospital-acquired bacterial pneumonia and ventilator-associated bacterial pneumonia caused by susceptible isolates of Acinetobacter baumannii-calcoaceticus complex

No.	Drug Name	Active Ingredient	Approval Date	FDA-approved use on approval date*
18.	Epkinly	epcoritamab-bysp	5/19/2023	To treat relapsed or refractory diffuse large B-cell lymphoma (not otherwise specified) and high-grade B-cell lymphoma after two or more lines of systemic therapy
17.	Miebo	perfluorhexyloctane	5/18/2023	To treat signs and symptoms of dry eye disease
16.	Veozah	fezolinetant	5/12/2023	To treat moderate to severe hot flashes caused by menopause
15.	Elfabrio	pegunigalsidase alfa-ixwj	5/9/2023	To treat confirmed Fabry disease
14.	Qalsody	tofersen	4/25/2023	To treat amyotrophic lateral sclerosis in adults who have a SOD1 gene mutation
13.	Joenja	leniolisib	3/24/2023	To treat activated phosphoinositide 3-kinase delta syndrome
12.	Rezzayo	rezafungin	3/22/2023	To treat candidemia and invasive candidiasis
11.	Zynyz	retifanlimab-dlwr	3/22/2023	To treat metastatic or recurrent locally advanced Merkel cell carcinoma
10.	Daybue	trofinetide	3/10/2023	To treat Rett syndrome
09.	Zavzpret	zavegepant	3/9/2023	To treat migraine
08.	Skyclarys	omaveloxolone	2/28/2023	To treat Friedrich's ataxia
07.	Filspari	sparsentan	2/17/2023	To reduce proteinuria in adults with primary immunoglobulin A nephropathy at risk of rapid disease progression
06.	Lamzede	velmanase alfa-tycv	2/16/2023	To treat non-central nervous system manifestations of alpha-mannosidosis
05.	Jesduvroq	daprodustat	2/1/2023	To treat anemia caused by chronic kidney disease for adults on dialysis for at least four months
04.	Orserdu	elacestrant	1/27/2023	To treat estrogen receptor-positive, human epidermal growth factor receptor 2-negative, ESR1-mutated, advanced or metastatic breast cancer with disease progression following at least one line of endocrine therapy
03.	Jaypirca	pirtobrutinib	1/27/2023	To treat relapsed or refractory mantle cell lymphoma in adults who have had at least two lines of systemic therapy, including a BTK inhibitor
02.	Brenzavvy	bexagliflozin	1/20/2023	To improve glycemic control in adults with type 2 diabetes mellitus as an adjunct to diet and exercise
01.	Leqembi	lecanemab-irmb	1/6/2023	To treat Alzheimer's disease

*Ref: <https://www.fda.gov/drugs/new-drugs-fda-cders-new-molecular-entities-and-new-therapeutic-biological-products/novel-drug-approvals-2023>

SYLLABUS FOR BCS PRELIMINARY TEST (Part-2)

English Language and Literature

Total Marks: 35

35

PART- I : Language

A. Parts of Speech:

- The Noun:
- The Determiner, The Gender, The Number,
- The Pronoun
- The Verb:
- The Finite: transitive, intransitive
- The Non-finite: participles, infinitives, gerund
- The Linking Verb, The Phrasal Verb, Modals
- The Adjective, The Adverb, The Preposition, The Conjunction

B. Idioms & Phrases:

- Meanings of Phrases
- Kinds of Phrases
- Identifying Phrases

C. Clauses:

- The Principal Clause
- The Subordinate Clause:
 - The Noun Clause
 - The Adjective Clause
 - The Adverbial Clause & its types

D. Corrections:

- The Tense, The Verb, The Preposition, The Determiner, The Gender, The Number, Subject-Verb Agreement

E. Sentences & Transformations:

- The Simple Sentence
- The Compound Sentence
- The Complex Sentence
- The Active Voice
- The Passive Voice
- The Positive Degree
- The Comparative Degree
- The Superlative Degree

F. Words:

- Meanings
- Synonyms
- Antonyms
- Spellings

Usage of words as various parts of speech

Formation of new words by adding prefixes and suffixes

G. Composition:

Names of parts of paragraphs/letters/applications

PART- II: Literature

H. English Literature:

Names of writers of literary pieces from Elizabethan period to the 21st Century.

Quotations from drama/poetry of different ages

বাংলাদেশ বিষয়াবলি

(BANGLADESH AFFAIRS)

পূর্ণমান ৩০

মান বন্টন
০৬

১. বাংলাদেশের জাতীয় বিষয়াবলি

প্রাচীনকাল হতে সম-সাময়িক কালের ইতিহাস, কৃষ্টি ও সংস্কৃতি। বাংলাদেশের স্বাধীনতা সংগ্রাম ও মহান মুক্তিযুদ্ধের ইতিহাস: ভাষা আন্দোলন: ১৯৪৫ সালের নির্বাচন; ছয় দফা আন্দোলন, ১৯৬৬ সালে গণ অভ্যুত্থান ১৯৬৮-৬৯, ১৯৭০ সালের সাধারণ নির্বাচন; অসহযোগ আন্দোলন ১৯৭১; ৭ই মার্চের ঐতিহাসিক ভাষণ; স্বাধীনতার ঘোষণা; মুজিবনগর সরকারের গঠন ও কার্যাবলি; মুক্তিযুদ্ধের রণকৌশল; মুক্তিযুদ্ধের বহু শক্তিবর্গের ভূমিকা; পাকিস্তান বাহিনীর আত্মসমর্পণ এবং বাংলাদেশের অভ্যুদয়।

২. বাংলাদেশের কৃষিজ সম্পদ

শস্য উৎপাদন এবং এর বহুমুখীকরণ, খাদ্য উৎপাদন ও ব্যবস্থাপনা

৩. বাংলাদেশের জনসংখ্যা, আদমশুমারি, জাতি, গোষ্ঠী ও উপজাতি সংক্রান্ত বিষয়াদি।

৪. বাংলাদেশের অর্থনীতি

উন্নয়ন পরিকল্পনা প্রেক্ষিত ও পঞ্চবার্ষিকী, জাতীয় আয়-ব্যয়, রাজনীতি ও বার্ষিক উন্নয়ন কর্মসূচি, দারিদ্র্য বিমোচন ইত্যাদি

৫. বাংলাদেশের শিল্প ও বাণিজ্য

শিল্প উৎপাদন, পণ্য আমদানি ও রপ্তানিকরণ, গার্মেন্টস শিল্প ও এর সার্বিক ব্যবস্থাপনা লেন-দেন, অর্থ প্রেরণ, ব্যাংক ও বীমা ব্যবস্থাপনা ইত্যাদি

৬. বাংলাদেশের সংবিধান

প্রস্তাবনা ও বৈশিষ্ট্য, মৌলিক অধিকারসহ রাষ্ট্র পরিচালনার মূলনীতিসমূহ সংবিধান সংশোধনীসমূহ।

৭. বাংলাদেশের রাজনৈতিক ব্যবস্থা :

রাজনৈতিক দলসমূহের গঠন, ভূমিকা ও কার্যক্রম, ক্ষমতাসীন ও বিরোধী দলের পারস্পরিক সম্পর্কাদি, সুশীল সমাজ ও চাপ সৃষ্টিকারী গোষ্ঠীসমূহ এবং এদের ভূমিকা।

৮. বাংলাদেশের সরকার ব্যবস্থা :

আইন, শাসন ও বিচার বিভাগসমূহ, আইন প্রণয়ন, নীতি নির্ধারণ, জাতীয় ও স্থানীয় পর্যায়ে প্রশাসনিক ব্যবস্থাপনা কাঠামো, প্রশাসনিক পুনর্বিন্যাস ও সংস্কার।

৯. বাংলাদেশের জাতীয় অর্জন, বিশিষ্ট ব্যক্তিত্ব, গুরুত্বপূর্ণ প্রতিষ্ঠান ও স্থাপনাসমূহ জাতীয় পুরস্কার, বাংলাদেশের খেলাধুলাসহ চলচ্চিত্র, গণমাধ্যম-সংশ্লিষ্ট বিষয়াদি।

Product List

INTERN Vision



Brand	Dosage Form	Generic & Strength
Anthelmintic		
Azole	Tablet Chewable	Albendazole 400 mg
	Suspension	Albendazole 10 ml (200 mg/5 ml)
Biotrex	Syrup	Levamisole 30 ml (40 mg/5 ml)
Antiasthmatic		
DoXiflo	Tablet	Doxophylline 200 mg
	Tablet	Doxophylline 400 mg
Freegest	Tablet Chewable	Montelukast 4 mg
	Tablet Chewable	Montelukast 5 mg
	Tablet	Montelukast 10 mg
Ketorif	Tablet	Ketotifen Fumarate 1 mg
	Syrup	Ketotifen Fumarate 100 ml (1mg/5 ml)
Antibiotic & Antibacterial		
Amotid	Capsule	Amoxicillin 250 mg
	Capsule	Amoxicillin 500 mg
	Pediatric Drops	Amoxicillin 15 ml (100 mg/ml)
	PFS	Amoxicillin 100 ml (125 mg/5 ml)
	Forte PFS	Amoxicillin 100 ml (250 mg/5 ml)
Amotid-CL	Tablet	Amoxicillin 500 mg & Clavulanic Acid 125 mg
	PFS	Amoxicillin 125 mg & Clavulanic Acid 31.25 mg
BESTCEF	Capsule	Cefixime 200 mg
	Capsule	Cefixime 400 mg
	PFS	Cefixime 37.5 ml (100 mg/5 ml)
	PFS	Cefixime 50 ml (100 mg/5 ml)
	Forte PFS	Cefixime 50 ml (200 mg/5 ml)
Biocap	Pediatric Drops	Cefixime 21 ml (25 mg/ml)
	Capsule	Doxycycline 100 mg
Biopen vk	Tablet	Phenoxymethyl Penicillin 250 mg
	PFS	Phenoxymethyl Penicillin 100 ml (125 mg/5 ml)
Cipcin	Tablet	Ciprofloxacin 250 mg
	Tablet	Ciprofloxacin 500 mg
	Tablet	Ciprofloxacin 750 mg
	GFS	Ciprofloxacin 60 ml (250 mg/5 ml)
	IV Infusion	Ciprofloxacin 100 ml (200 mg/100 ml)
Clamycin	Tablet	Clarithromycin 500 mg
Erosa	Tablet	Erythromycin 250 mg
	Tablet	Erythromycin 500 mg
	PFS	Erythromycin 100 ml (125 mg/5 ml)
Gefcin	Tablet	Gemifloxacin 320 mg
Lifcin	Tablet	Levofloxacin 500 mg
	Oral Solution	Levofloxacin 100 ml (125 mg/5 ml)
Maczith Azithromycin	Capsule	Azithromycin 250 mg
	Tablet	Azithromycin 500 mg
	PFS	Azithromycin 15 ml (200 mg/5 ml)
	PFS	Azithromycin 35 ml (200 mg/5 ml)
Moxif 400 Moxifloxacin HCl Tablet	PFS	Azithromycin 50 ml (200 mg/5 ml)
	Tablet	Moxifloxacin 400 mg

Brand	Dosage Form	Generic & Strength
Antibiotic & Antibacterial (Continue)		
Mextil	Tablet	Cefuroxime Axetil 250 mg
	Tablet	Cefuroxime Axetil 500 mg
	IV/IM Injection	Cefuroxime Sodium 750 mg
	PFS	Cefuroxime Axetil 70 ml (125 mg/5 ml)
	DS-PFS	Cefuroxime Axetil 50 ml (250 mg/5 ml)
Mepen	Injection	Meropenem USP 500 mg
	Injection	Meropenem USP 1gm
Mexclav	Tablet	Cefuroxime 250 mg+Clavulanic Acid 62.5 mg
	Tablet	Cefuroxime 500 mg+Clavulanic Acid 125 mg
	PFS	Cefuroxime 125 mg+Clavulanic Acid 31.25 mg/5 ml
Revistar	Capsule	Flucloxacillin 250 mg
	Capsule	Flucloxacillin 500 mg
	PFS	Flucloxacillin 100 ml (125 mg/5 ml)
Riboclin	Capsule	Clindamycin 300 mg
	Capsule	Cephadrine 250 mg
Supracef	Capsule	Cephadrine 500 mg
	Pediatric Drops	Cephadrine 15 ml (125 mg/1.25 ml)
	PFS	Cephadrine 100 ml (125 mg/5 ml)
	Forte PFS	Cephadrine 100 ml (250 mg/5 ml)
	IM Injection	Ceftriaxone 500 mg
Winner	IM Injection	Ceftriaxone 1 gm
	IV Injection	Ceftriaxone 500 mg
	IV Injection	Ceftriaxone 1 gm
	IV Injection	Ceftriaxone 2 gm
	IV/IM Injection	Ceftazidime 250 mg
Zidimax	IV/IM Injection	Ceftazidime 500 mg
	IV/IM Injection	Ceftazidime 500 mg
Rifexa	Tablet	Rifaximin 200 mg
	Tablet	Rifaximin 550 mg
Antidiabetic		
Dialina	Tablet	Linagliptin 5 mg
Empavic	Tablet	Empagliflozin 10 mg
	Tablet	Empagliflozin 25 mg
Diavil	Tablet	Vildagliptin 50 mg
Formet Sensilize	Tablet	Metformin HCl 500 mg
	Tablet	Metformin HCl 850 mg
Formet-L	Tablet	Metformin Hydrochloride BP 500 mg & Linagliptin INN 2.5 mg
Formet-V	Tablet	Metformin HCl 500 mg & Vildagliptin 50 mg
FORMET XR	Tablet	Metformin Hydrochloride 500 mg
	Tablet	Metformin Hydrochloride 1 gm
GlucoStat	Tablet	Gliclazide 80 mg
GlucoStat MR	Tablet	Gliclazide 60 mg
GLUCORID	Tablet	Glimepiride 1 mg
	Tablet	Glimepiride 2 mg
Antiemetic		
AVERT	Tablet	Metoclopramide HCl 50 mg
AVERT Plus	Tablet	Metoclopramide HCl 25 mg+ Pyridoxine HCL 50 mg
	Tablet	Metoclopramide HCl 25 mg+ Pyridoxine HCL 50 mg
Onstar	Tablet (ODT)	Ondansetron 8 mg
	Oral Solution	Ondansetron 50 ml (4 mg/5 ml)





Brand	Dosage Form	Generic & Strength
Gastroprokinetic		
Esogut[®]	Tablet	Domperidone 10 mg Tablet
	Suspension	Domperidone 60 ml (5 mg/5 ml)
	Pediatric Drops	Domperidone 15 ml (5 mg/ml)
Antilulcerant		
Gastisol	Suspension	Sodium Alginate & Potassium Bicarbonate
Gastisol cool	Suspension	Sodium Alginate, Sodium Bicarbonate & Calcium Carbonate
Biocid plus	Suspension	200 ml (Aluminium Hydroxide 200 mg+ Magnesium Hydroxide 400 mg+Simethicone 30 mg/5 ml)
Esocon[®]	Capsule	Esomeprazole 20 mg
	Capsule	Esomeprazole 40 mg
	Injection	Esomeprazole 40 mg
Esocon MUPS	Tablet	Esomeprazole 20 mg
Famoloc[®]	Tablet	Famotidine 20 mg
	Tablet	Famotidine 40 mg
	PFS	Famotidine 40 mg/ 5 ml
Inpro[®]	Capsule	Omeprazole 20 mg
	Capsule	Omeprazole 40 mg
	Injection	Omeprazole 40 mg
Lasocon	Capsule	Lansoprazole 30 mg
Lasocon D[®]	Capsule	Dexlansoprazole 30 mg
Panpro[®]	Tablet	Pantoprazole 20 mg
	Tablet	Pantoprazole 40 mg
	Injection	Pantoprazole 40 mg
Rabecon[®]	Tablet	Rabeprazole Sodium 20 mg
Antigout		
Goutex	Tablet	Allopurinol 100 mg
Antiparasitic		
Biomec	Tablet	Ivermectin 6 mg
	Tablet	Ivermectin 12 mg
Antihistamine		
Alerfast[®]	Tablet	Fexofenadine HCl 120 mg
	Tablet	Fexofenadine HCl 180 mg
	Suspension	Fexofenadine HCl 50 ml (30 mg/5 ml)
Biocin	Tablet	Chlorpheniramine Maleate 4 mg
	Syrup	Chlorpheniramine Maleate 100 ml (2 mg/5 ml)
Lorfast[®]	Tablet	Loratadine 10 mg
	Suspension	Loratadine 60 ml (5 mg/5 ml)
Rinotin	Tablet	Levocetirizine 5 mg
Rufecta[®]	Tablet	Rupatadine Fumarate 10 mg
	Oral Solution	Rupatadine Fumarate 60 ml (5 mg/5 ml)
Antispasmodic		
Relvis[®]	Tablet	Tiemonium methylsulphate 50 mg
	IV/IM Injection	Tiemonium methylsulphate (5 mg/2 ml)

Brand	Dosage Form	Generic & Strength
Antioxidant		
Vitaforce	Tablet	Vitamin E 50 mg+Vitamin C 200 mg +Beta Carotene 6 mg
Vitaforce-S	Tablet	Super Antioxidant (4 Vitamins+4 Minerals)
Antiprotozoal		
ATINID	Tablet	Nitazoxanide 500 mg
	PFS	Nitazoxanide 30 ml (100 mg/5 ml)
	PFS	Nitazoxanide 60 ml (100 mg/5 ml)
Biozyl	Tablet	Metronidazole 400 mg
	Suspension	Metronidazole 60 ml (200 mg/5 ml)
	IV Infusion	Metronidazole 100 ml (0.5%)
Antifibrinolytic		
BioneX	Capsule	Tranexamic Acid 500 mg
Antiepileptic / Anticonvulsive		
Lirica[®]	Capsule	Pregabalin 25 mg
	Capsule	Pregabalin 50 mg
	Capsule	Pregabalin 75 mg
Anxiolytic & Antidepressant		
Benzit[®]	Tablet	Flupentixol 0.5 mg+Melitracen 10 mg
Benquil	Tablet	Midazolam 7.5 mg
Broze	Tablet	Bromazepam 3 mg
Calm	Tablet	Clobazam 10 mg
	Tablet	Clobazam 0.5 mg
Cloma[®]	Tablet	Clonazepam 1 mg
	Tablet	Clonazepam 2 mg
	Tablet	Clonazepam 0.5 mg
Lexapro	Tablet	Escitalopram 5 mg
	Tablet	Escitalopram 10 mg
Miramind	Tablet	Mirtazapine 7.5 mg
	Tablet	Escitalopram 15 mg
Disease-modifying Anti-rheumatic		
Coroquin	Tablet	Hydroxychloroquine Sulfate 200 mg
Gastrointestinal Agent		
Ocaliva	Tablet	Obeticholic Acid 5 mg
	Tablet	Obeticholic Acid 10 mg
UDCA[®]	Tablet	Ursodeoxycholic Acid 300 mg
Bronchodilator		
Salbu	Tablet	Salbutamol 2 mg
	Tablet	Salbutamol 4 mg
	Syrup	Salbutamol 100 ml (2 mg/5 ml)
Salbu-L	Syrup	Levosaltbutamol 100 ml

Product List

INTERN Vision



Brand	Dosage Form	Generic & Strength
Cardiovascular Drug		
BESTCOL	Tablet	Rosuvastatin 5 mg
	Tablet	Rosuvastatin 10 mg
Carved	Tablet	Carvedilol 6.25 mg
Emlon	Tablet	Amlodipine 5 mg
Emlon plus	Tablet	Amlodipine 5 mg + Atenolol 50 mg
Etnol	Tablet	Atenolol 50 mg
Lopo	Tablet	Losartan Potassium 25 mg
	Tablet	Losartan Potassium 50 mg
Lopo plus	Tablet	Losartan Potassium 50 mg + Hydrochlorothiazide 12.5 mg
myocor	Tablet	Bisoprolol Fumarate 2.5 mg
	Tablet	Bisoprolol Fumarate 5 mg
Olvance	Tablet	Olmesartan Medoxomil 20 mg
Olvance -AM	Tablet	Olmesartan Medoxomil 20 mg+ Amlodipine 5 mg
R-pil	Tablet	Ramipril 1.25 mg
	Tablet	Ramipril 2.5 mg
	Tablet	Ramipril 5 mg
Trangina MR	Tablet	Trimetazidine HCl 35 mg
Urospin	Tablet	Spironolactone 50 mg+ Furosemide 20 mg
Trova	Tablet	Atorvastatin Calcium 10 mg
	Tablet	Atorvastatin Calcium 20 mg
Vasofex XR	Tablet	Prazosin 2.5 mg
	Tablet	Prazosin 5 mg
Anti-Coagulant/ Anti-Thrombotic		
Asclor	Tablet	Aspirin 75 mg + Clopidogrel 75 mg
Enomia	Injection	Enoxaparin Sodium 40
	Injection	Enoxaparin Sodium 60
Myoclop	Tablet	Clopidogrel 75mg
Rixoban	Tablet	Rivaroxaban 2.5 mg
	Tablet	Rivaroxaban 10 mg
Expectorant		
Ambroxol	Syrup	Ambroxol Hydrochloride (15 mg/5 ml)
Mucut	Syrup	Bromhexine HCl 100 ml (4 mg/5 ml)
Biokof	Syrup	Butamirate Citrate 100 ml
Laxative		
Lactu	Oral Solution	Lactulose 100 ml (3.35 gm/5 ml)
	Oral Solution	Lactulose 200 ml (3.35 gm/5 ml)
Magnolax	Syrup	Magnesium Hydroxide & Liquid Paraffin
Muscle Relaxant		
Bacifen	Tablet	Baclofen 10 mg
Tolpa	Tablet	Tolperisone HCl 50 mg

Brand	Dosage Form	Generic & Strength
NSAIDs		
Aceta	Tablet	Paracetamol 500 mg
	Suspension	Paracetamol 60 ml (120 mg/5 ml)
	Suspension	Paracetamol 100 ml (120 mg/5 ml)
	Pediatric Drops	Paracetamol 30 ml (80 mg/ml)
Aceta Extend	Tablet	Paracetamol 665 mg
Aceta One	Tablet	Paracetamol 1000 mg
Aceta-T	Tablet	Paracetamol 325 mg + Tramadol HCl 37.5 mg
Aceta-X	Tablet	Paracetamol 500 mg + Caffeine 65 mg
Biocox	Tablet	Etoricoxib 90 mg
Clof	Tablet	Aceclofenac 100 mg
Perilac	Tablet	Ketorolac Tromethamine 10 mg
	Injection	Ketorolac Tromethamine 30 mg/ml
	Injection	Ketorolac Tromethamine 60 mg/2 ml
Napgin	Tablet	Naproxen 500 mg
Napgin Plus	Tablet	Naproxen 500 mg + Esomeprazole 20 mg
Tolema	Tablet	Tolfenamic Acid 200 mg
Top	Tablet	Ketoprofen 50 mg
	Tablet	Ketoprofen 100 mg
Volcan	Tablet	Diclofenac Sodium 50 mg
	Tablet SR	Diclofenac Sodium 100 mg
Parenteral Nutrition		
Amilac	Infusion	5% w/v Composite Amino Acid+ D-Sorbitol+Electrolytes (500 ml)
Sex Stimulant		
Immense	Tablet	Sildenafil 50 mg
penFIL	Tablet	Tadalafil 10 mg
	Tablet	Tadalafil 20 mg
BPH Drug		
EZIFLO	Capsule	Tamsulosin HCl 0.4 mg
Eziflo-D	Capsule	Tamsulosin HCl 0.4 mg + Dutasteride 0.5 mg
Hand Rub / Hand Sanitizer		
BIORUB	10 ml	Chlorhexidine 0.5% + Isopropyl Alcohol 75%
	250 ml	
BIORUB- I	50 ml	Isopropyl Alcohol 75%+
	100 ml	Hydrogen Peroxide 0.125%+
	250 ml	Glycerol 1.45%
Bone Nutrient		
Glucium	Tablet	Glucosamine Sulfate 250 mg + Chondroitin Sulfate 200 mg
Glucium-D	Tablet	Glucosamine Sulfate 750 mg + Diacerein 50 mg Tablet





Brand	Dosage Form	Generic & Strength
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Vitamin and Minerals

Biovit	Capsule	Vitamin B Complex
	Syrup	Vitamin B Complex (100 ml)
	Syrup	Vitamin B Complex (200 ml)
	Pediatric Drops	Vitamin B Complex + Vitamin A + D + C + Calcium-D-Pantothenate (15 ml)
Biovit Gold	Tablet	14 Vitamins + 18 Minerals (15's)
	Tablet	14 Vitamins + 18 Minerals (30's)
Biovit Silver	Tablet	15 Vitamins + 16 Minerals (15's)
	Tablet	15 Vitamins + 16 Minerals (30's)
Biovit-M	Tablet	11 Vitamins + 6 Minerals
Biovit-E	Tablet (Chewable)	Vitamin E 200 mg
Biovit plus	Syrup	Iron Polymaltose + Vitamin B Complex + Zinc
Biron plus	Capsule	Iron 150 mg+ Zinc 61.8 mg + Folic Acid 0.5 mg
Cevalin	Tablet (Chewable)	Ascorbic Acid 250 mg
Kidsgro	Syrup	Cod Liver Oil with Multivitamin
Fivita Z	Capsule	Iron polymaltose Complex, Folic acid, Vitamin B complex & Zinc
Neurep	Tablet	Vitamin B1 100 mg + B6 200 mg + B12 200 mcg
Orthocal	Tablet	Calcium Carbonate 500 mg
Orthocal-D	Tablet	Calcium Carbonate 500 mg + Vitamin D 200 IU (15's)
	Tablet	Calcium Carbonate 500 mg + Vitamin D 200 IU (30's)
Ortho-D₃	Capsule	Cholecalciferol 40000 IU
	Tablet	Cholecalciferol 2000 IU
	Tablet	Cholecalciferol 1000 IU
	Oral Solution	Cholecalciferol 100 ml (1000 IU/5 ml)
Orthorate	Tablet	Calcium Orotate 400 mg
Zinga	Tablet	Zinc Sulphate 20 mg
	Syrup	Zinc Sulphate 100 ml (10 mg/5 ml)
Zinga-B	Tablet	Zinc & Vitamin B Complex
	Syrup	Zinc & Vitamin B Complex (100 ml)

Neurep
Vitamin B1, B6 & B12 Tablet

Say No to Neuropathy
Yes to Active Life

Vitamin B1
Strengthen nerves and serves as a source of energy for nerves

Vitamin B6
Promotes transmission of nerve impulses and reduces neuropathic pain

Vitamin B12
Regenerates nerves and prevents nerve cells from damage

Brand	Dosage Form	Generic & Strength
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DERMA PRODUCTS

Antifungal

FUNGATA	Capsule	Fluconazole 50 mg
	Capsule	Fluconazole 150 mg
	PFS	Fluconazole 35 ml (50 mg/5 ml)
Termider	Cream	Terbinafine HCl 1% (10 gm)
	Tablet	Terbinafine HCl 250 mg
Vcand	Tablet	Voriconazole 200 mg
	Tablet	Voriconazole 50 mg
	PFS	Voriconazole 40 ml (200 mg/5 ml)
Lulifun	Cream	Luliconazole 1%

Topical Antifungal with Corticosteroid

CLOTISON	Cream	Clotrimazole 1% + Hydrocortisone 1% (10 gm)
Enazol plus	Cream	Econazole Nitrate 1%+Triamcinolone Acetonide 0.1% (10 gm)

Topical Antibiotic

Bacron	Ointment	Mupirocin 2% (10 gm)
Nuba	Ointment	Neomycin Sulphate 5 mg+ Bacitracin Zinc 500 IU/g (20 gm)
Nuba Plus	Ointment	Neomycin Sulphate 0.35%+Bacitracin Zinc 400 IU/g+Polymyxin B Sulphate 5000 IU/g (10 gm)

Topical Antiparasite

Scaper	Cream	Permethrin 5% (15 gm)
	Cream	Permethrin 5% (30 gm)

Topical Corticosteroid

Mexiderm	Cream	Betamethasone Valerate 0.1% (15 gm)
	Ointment	Betamethasone Valerate 0.1% (15 gm)
Xderm	Cream	Clobetasol Propionate 0.05% (10 gm)
	Ointment	Clobetasol Propionate 0.05% (10 gm)
Xderm-S	Ointment	Clobetasol Propionate 0.05% + Salicylic Acid 3% (10 gm)

Topical Antibiotic with Corticosteroid

Mexiderm-F	Cream	Fusidic Acid 2% + Betamethasone 0.1% (10 gm)
Mexiderm-N	Cream	Betamethasone Valerate 0.1%+ Neomycin Sulphate 0.5% (10 gm)
	Ointment	Betamethasone Valerate 0.1%+ Neomycin Sulphate 0.5% (10 gm)
	Ointment	Betamethasone Valerate 0.1%+ Neomycin Sulphate 0.5% (10 gm)

Topical Antibiotic, Antifungal with Corticosteroid

Xderm-N	Cream	Clobetasol Propionate 0.5 mg+Neomycin Sulphate 5 mg+Nystatin 100,000 IU (10 gm)
	Ointment	Clobetasol Propionate 0.5 mg+Neomycin Sulphate 5 mg+Nystatin 100,000 IU (15 gm)

Topical Acne preparation

Pimplex	Cream	Adapalene 0.1% (10 gm)
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Anti-Septic Solution

LISTARIN	120 ml	Eucalyptol 0.092gm+Methyl salicylate 0.060gm
	250 ml	+Thymol 0.064gm+ Menthol 0.042gm/100ml
Povix	100 ml	Povidone-Iodine 10%

Product List



Brand	Dosage Form	Generic & Strength
Antibiotic		
Moxif	Eye Drops	Moxifloxacin 0.5% (5 ml)
Cipcin	Eye/Ear Drops	Ciprofloxacin 0.3% (5 ml)
Lifcin 1.5	Eye Drops	Levofloxacin 1.5% (5 ml)
Ocuflex	Eye Drops	Lomefloxacin 0.3% (5 ml)
XITOB	Eye Drops	Tobramycin 0.3% (5 ml)
ChloroVIS	Eye Drops	Chloramphenicol 0.5% (10 ml)
Steroid		
Infladex	Eye/Ear Drops	Dexamethasone Sodium Phosphate 0.1% (5 ml)
FLURONE	Eye Drops	Fluorometholone 0.1% (5 ml)
Biocort	Eye Drops	Prednisolone Acetate 1% (5 ml)
Antibiotic-Steroid Combination		
Cipcin-DX	Eye/Ear Drops	Ciprofloxacin 0.3% + Dexamethasone 0.1% (5 ml)
Infladex-TN	Eye Drops	Dexamethasone 0.1% + Tobramycin 0.3% (5 ml)
Antiallergic		
OLARIF	Eye Drops	Olopatadine 0.1% (5 ml)
Olarif DS	Eye Drops	Olopatadine 0.2% (5 ml)
Artificial Tear		
Aquatear	Eye Drops	Povidone 5% (10 ml)
I-fort	Eye Drops	Polyethylene Glycol 400 0.4% and Propylene Glycol 0.3% (10 ml)
NSAID		
Relve	Eye Drops	Bromfenac 0.09% (5 ml)
Antiviral		
Optivir	Eye Ointment	Aciclovir 3% (5 gm)
Eye Vitamin & Mineral		
Biovit - i	Capsule	Vit C 60 mg+ Vit E 30 mg+ Lutein 6 mg+ Copper 2 mg+ Zinc 15 mg

INTERN Vision



BESTCEF
Cefixime trihydrate
A Bioequivalent Brand

All dosage forms are available for all aged patients

Capsule

- 200 mg
- 400 mg

Powder for Suspension

- 37.5 ml PFS (100 mg/ 5 ml)
- 50 ml PFS (100 mg/ 5 ml)
- 50 ml F-PFS (200 mg/ 5 ml)

Paediatric Drops

- 21 ml (25 mg/ ml)



Save the stomach from **burning** issues

With

Esocon
Esomeprazole

Ensures relief from frequent
Acid reflux & Heartburn



Exported to



Myanmar



Ivory Coast



Vietnam



Nigeria



Somalia

Available as

- 20 mg Capsule
- 40 mg Capsule
- 20 mg MUPS Tablet
- 40 mg Injection

Mexclav

Cefuroxime & Clavulanic Acid

The **STAR Cephalosporin** with
Plus Advantages



500 mg Tablet

250 mg Tablet

70 ml PFS



- Respiratory Tract Infections
- Surgical Prophylaxis
- Urinary Tract Infections
- Gynaecological Infections
- Dental Infections



BIOPHARMA
LIMITED
Committed to Serving Mankind

27

Word Puzzle

1					8	9	10	12	14
		5		7					
	3		6						
								13	
2							11		15
	4								

Instruction

Above downward:

1. The holy book.
2. Atorvastatin preparation of BIOPHARMA.
3. Vitamin preparation of BIOPHARMA.
4. Short form of Electrocardiogram
5. The Feeling of having a fast beating, fluttering or pounding heart.
6. Physical activity.
7. Name of an anti coagulant which may help prevent thrombus formation.
8. Heart rate over 100 beats/min.
9. Way to keep heart healthy.
10. Bisoprolol Fumarate preparation of BIOPHARMA.
11. Organ which pumps blood throughout our body.
12. Omeprazole preparation of BIOPHARMA.
13. Ketorolac Tromethamine preparation of BIOPHARMA.
14. Type of chest pain caused by reduced blood flow to the heart.
15. Clonazepam preparation of BIOPHARMA.

Left to right:

1. Refers to irregular heart beat. The heart may beat too quickly too slowly too early or with an irregular rhythm.

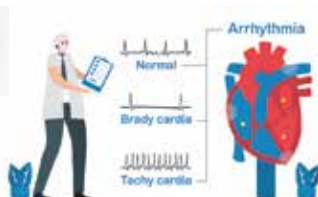
Please mail
the Post Card
within
January 20
2024



Aquatear
Povidone 5%

Eye Drops

Effective substitute of tear fluid



Letter Puzzle

Instruction

There are some scattered or unorganized letters and specific boxes for them. Rearrange those letters in such a way that indicate some meaningful word related to human body. Please fill up these boxes so that each letter remain in each box. There is also one shaded box in each row. If you rearrange the shaded letters you'll get antibiotic preparation of BIOPHARMA.

Please write down that drug name & its generic name in the specific space of the enclosed BUSINESS REPLY POSTCARD.

RBANI

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EHART

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IDSEASE

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RAETRY

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ECLL

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EAHLTH

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AFCIAL

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PRODUCT NAME:.....

GENERIC NAME :

Cardiovascular Drug ...Excellence in Quality

Brand	Generic & Strength
Asclop	Aspirin 75 mg+ Clopidogrel 75 mg
BESTCOL	Rosuvastatin 5 mg & 10 mg
Carved	Carvedilol 6.25 mg & 25 mg
Emlon	Amlodipine 5 mg
Emlon plus	Amlodipine 5 mg+ Atenolol 50 mg
Etnol	Atenolol 50 mg
Lop0	Losartan Potassium 25 mg, 50 mg & 100 mg
Lopo plus	Losartan Potassium 50 mg+ Hydrochlorothiazide 12.5 mg
Myocor	Bisoprolol Fumarate 5 mg
Olavance	Olmesartan Medoxomil BP 20 mg
R-pil	Ramipril 1.25 mg, 2.5 mg & 5 mg
Urospin	Spironolactone 50 mg+ Furosemide 20 mg
Trova	Atorvastatin Calcium 10 mg & 20 mg

Word Puzzle

1 A	R	R	H	Y	8 T	9 H	10 M	12 I	14 A
L	O	5 P	O	7 W	R	E	Y	N	N
Q	3 B	A	6 E	A	A	A	O	P	G
U	I	L	X	R	C	I	C	R	I
R	O	P	C	F	H	T	O	O	N
A	V	I	E	A	Y	H	R	13 P	A
N	I	T	R	R	C	Y		E	
2 T	T	A	C	I	A	F	11 H	R	15 C
R		T	I	N	R	O	E	I	L
O	4 E	I	S		D	O	A	L	O
V	C	O	E		I	D	R	A	M
A	G	N			A		T	C	A

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RBANI

B	R	A	I	N
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EHART

H	E	A	R	T
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IDSEASE

D	I	S	E	A	S	E
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RAETRY

A	R	T	E	R	Y
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ECLL

C	E	L	L
---	---	---	---

EAHLTH

H	E	A	L	T	H
---	---	---	---	---	---

AFCIAL

F	A	C	I	A	L
---	---	---	---	---	---

PRODUCT NAME:.....BESTCEF

GENERIC NAME :Cefixime Trihydrate



BIOPHARMA *Manufactures* **BIOEQUIVALENT** *Products*

Biopharma Limited has been practising its quality policy from the inception in 1999 in order to provide finest quality medicines for the patients in home and abroad. Recently, 11 products have been undergone Bioequivalence (BE) Study in US-FDA approved, renowned Contract Research Organization (CRO) and compared with innovator company's products. These BE studies have shown and proven that Biopharma's Products comply with Pharmaceutical and Pharmacological parameters and Bioequivalent to the Originator Brands.

Maczith
Azithromycin

equivalent to **Zithromax (Pfizer)**

Inpro
Omeprazole

equivalent to **Losec (AstraZeneca)**

MeXtil
Cefuroxime

equivalent to **Zinacef (GlaxoSmithKline)**

BESTCEF
Cefixime trihydrate

equivalent to **Tergecef (Unilab)**

Clamycin
Clarithromycin

equivalent to **Klaricid (Abbot)**

Gluco^{stat} MR
Gliclazide Modified Release

equivalent to **Diamicron MR (SERVIER)**

Vasofex XR
Prazosin Extended Release Tablet

equivalent to **Minipress XL (Pfizer)**



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