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Volume 11 Number 21

INTERN Vision

A Unique Newsletter only for Intern Doctors



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Welcome to the 21th 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 **"Transforming Medical Internship: A Pathway to Empowerment and Ethical Excellence - A Global Perspective with Bangladeshi Insights"** as Cover Article & **"Dengue Management"-Information for Health Care Practitioners-** as Review Article which is very important for a medical professional and information **about MRCS (Part A & B)** course. It also helps to build-up post graduation career.

We have also focused on Practical procedure about **'The use of PRP injections in the management of knee osteoarthritis'** 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 (Word, Letter Puzzle & Medi Quiz) 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

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With regards,
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Transforming Medical Internship: A Pathway to Empowerment and Ethical Excellence - A Global Perspective with Bangladeshi Insights

Prof. Md. Dr. Mahabubul Islam Majumder
Professor & Head
Department of Medicine, Central Medical College, Cumilla, Bangladesh.

Introduction:

The transition from medical college to clinical practice is a crucial stage in a physician's training. This term of supervised practice, known as a medical internship, provides as a bridge between academic education and independent clinical work[1-3]. When internship is reconceived as an empowering period of growth and learning, it offers unique chances for professional development[4]. Internships are naturally demanding, but they also bring unique opportunities for professional development. Research investigates options for maximizing and internationalizing internships through high-quality education, mentoring, and ethical training[5]. Bangladeshi perspectives are used to contextualize these global proposals. With thorough assistance and an empowering philosophy, medical educators may convert internships into a motivating springboard for interns to become competent, compassionate, and morally grounded physicians.

Internationalization of Medical Internships:

In a bunch of countries, medical internships bridge the gap between medical school and specialty training. There have developed six prominent models for medical training, despite the fact that many nations employ varying frameworks and durations. These models vary in terms of training duration, complete registration, and degrees awarded. Acceptance of the concept of internationalization has become crucial for the following reasons:

1. As healthcare systems grow more integrated, medical practitioners must be prepared to operate in a variety of global contexts.
2. Governmental pressures are pressing for the standardization and certification of medical education programs around the globe.
3. Improved Communication Channels Technological breakthroughs allow for the smooth transmission of information across medical groups worldwide.
4. Establishing a shared language allows improved communication and comprehension of medical procedures through the creation of a common vocabulary.
5. Education and Standards Based on Results: An emphasis on outcomes promotes the adoption of best practices and continual improvement.
6. Staff Development Initiatives: International experiences increase medical professionals' abilities and views.
7. Competitiveness and Commercialization: The worldwide demand for superior medical services motivates institutions to cultivate internationally competent physicians.

Adhering to WFME Guidelines:

WHO and WFME promote the formation of accrediting processes based on predetermined criteria in order to assure effective, impartial, and transparent medical education accreditation. Initiated in 1997, the WFME Global Standards initiative is widely supported and acts as a critical foundation for this growth. As new medical schools of dubious quality grow, adherence to these rules becomes essential for preserving the quality of medical education[3].

Empowering Interns through Ethical Education:

Interdepartmental, interactive seminars addressing many areas of clinical ethics provide an innovative method for educating interns. Collaborations across the departments of psychiatry, pharmacology, surgery, and medicine provide medical trainees with a comprehensive learning environment. Integrating online conversations complements the lectures by sensitizing interns to ethical concerns, boosting their understanding, and motivating them to make ethical decisions.

Reimagining Internship as an Empowering Rite of Passage:

Medical graduates may regard internship as a frightening trial by fire as opposed to a constructive developmental stage.

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However, conceiving of an internship as a transformational journey enhances learning and development[6]. This rite of passage can promote personal and professional flexibility by:

- Providing stepped duties under supervision to foster the development of clinical skills and sound judgment.
- Cultivating professional identity and role modeling via mentorship
- Strengthening coping skills and resilience
- Creating chances for self-directed learning and reflection
- Permitting interns to identify their talents, values, and career goals

When supported appropriately, internship serves as an enriching odyssey where fledgling doctors transition into competent professionals ready for greater responsibilities.

Globalization and Internationalization of Medical Internships:

There are global demands to internationalize training standards in medical education[7]. As health systems grow increasingly integrated, medical graduates must acquire global capabilities to meet a variety of health demands[8]. The globalization of internships is prompted by:

- Government policy encouraging uniform medical education programs
- Global communication technology that facilitate international collaboration
- Creation of standardized medical vocabulary
- Concentrate on competency-based learning and results
- Institutional incentives to boost global standing and competitiveness

These forces make international electives and exchanges integral to medical training today. By incorporating global perspectives, internship programs can better equip interns to tackle local and worldwide healthcare challenges[9].

Optimizing Internship in the Bangladeshi Context:

Improving the quality of clinical training during internships is essential for the development of the healthcare system in Bangladesh. Strategies consist of:

- Adoption of a national internship program that meets worldwide certification requirements
- Integration of ethics, professionalism, and communication skills curricula
- Robust mentoring programs that match interns with faculty mentors
- Service in underserved and rural communities to comprehend healthcare inequities

Academic links with top international institutes for international exposure. Bangladesh must also address the underlying health system issues influencing the quality of internships, including as limited infrastructure, labor shortages, and resource limitations.

Strengthening Ethical Education during Internship:

Internship represents a formative phase for developing ethical foundations and professional identity[10]. Integrating clinical ethics through:

- Dedicated lectures and case discussions
- Ethics committees and grand rounds
- Ward and outpatient ethics rounds
- Online journals and forums

By emphasizing ethics and humanistic care, programs produce physicians who are committed to a lifetime practice with integrity. There is a need for a more comprehensive paradigm that encompasses variables such as job overload, loss of autonomy, and difficulties in the learning environment that contribute to burnout. Residents suffering should be evaluated across various dimensions, including work-life imbalance, loss of motivation, and cynicism[11]. The suggested paradigm highlights the need of treatments that target both individual and systemic issues. Reductions in work hours, protected time for self-care and contemplation, greater supervision and mentorship, and a shift in corporate culture are necessary to promote wellbeing at the organizational level. At the level of the person, residents can benefit from stress management, self-care skills, cognitive restructuring approaches, and greater social support. For substantial progress to be made in addressing the high rates of internship burnout, a comprehensive strategy is necessary. This has significant consequences for promoting the professional growth of residents and ensuring the safety of patient care.

Challenges and Potential Harms:

Several fundamental aspects of medical internship programs, such as financial inequities, lack of senior doctor supervision, competence issues, and short rotation lengths, might predispose trainees to damage patients and communities[12]. Current internship models may leave interns unattended, doubting the adequacy of their interventions, and battling contradictory role values. The government's failure to implement proper safeguards jeopardizes not only the welfare of interns, but also the quality and continuity of patient treatment, potentially infringing on their entitlement to the highest achievable level of health[13].

Conclusion:

Internships for new physicians worldwide are critical, fostering personal and professional growth. An ideal program should provide high-quality clinical training, mentoring, self-reflection, and ethical guidance. Addressing systemic barriers is vital for effective medical education. By internationalizing and improving

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internships, the global medical community can nurture ethical and competent healthcare providers.

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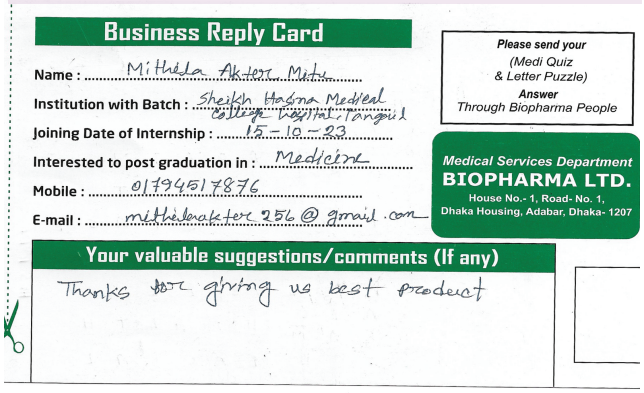
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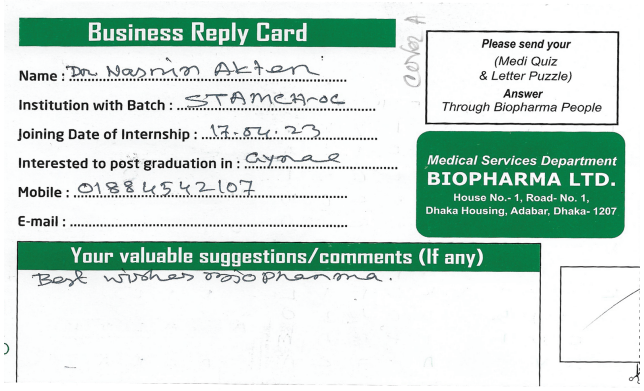
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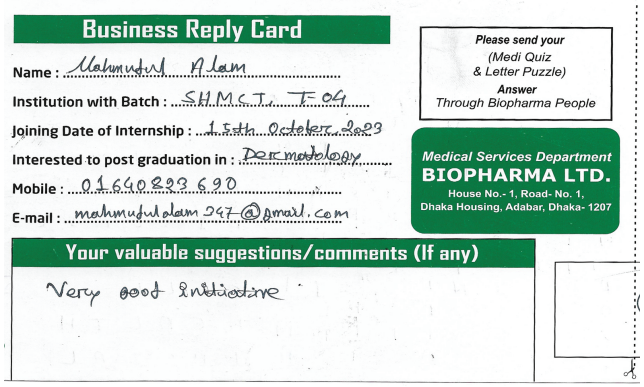
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Dengue Management

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:

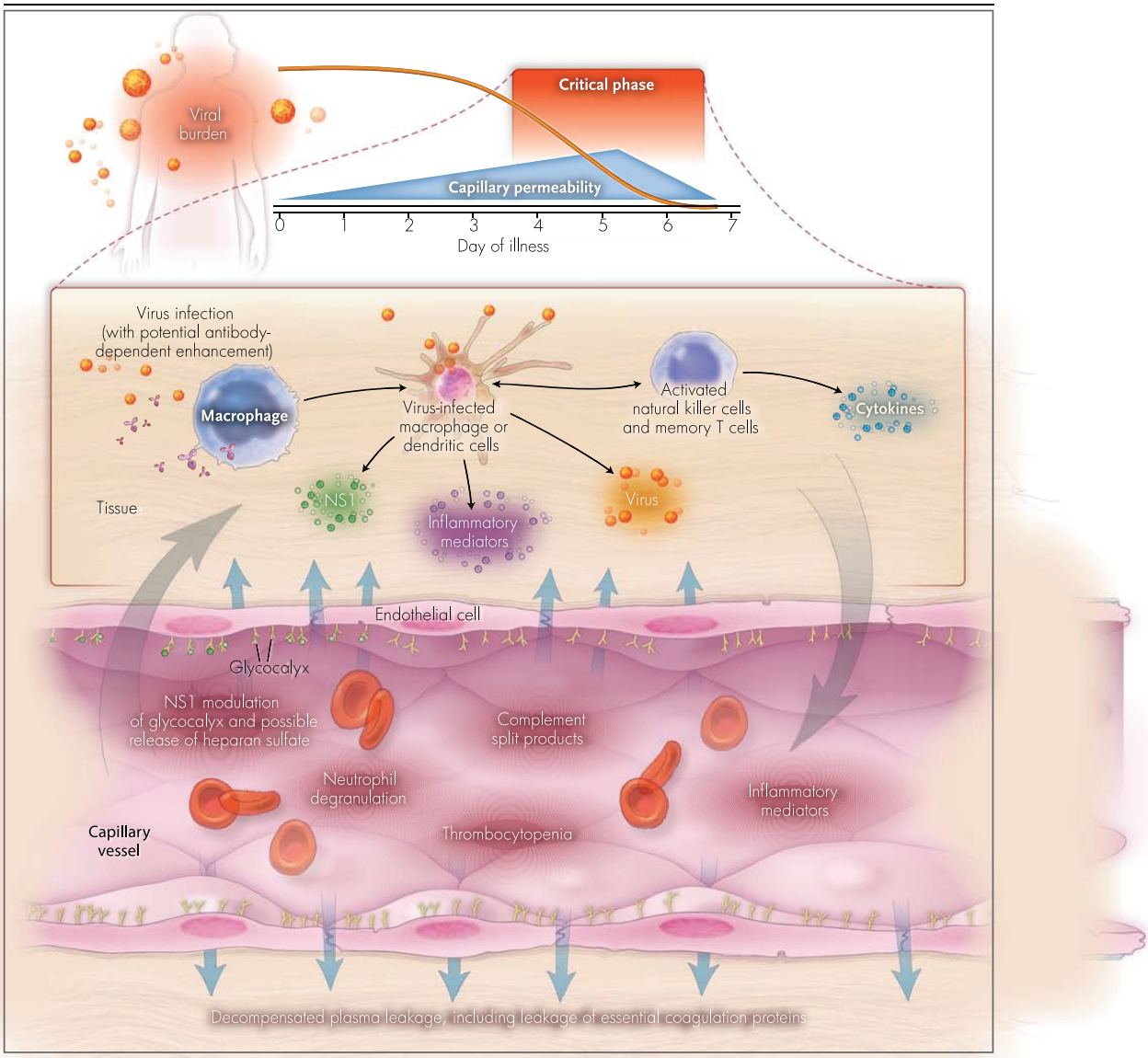

Figure 1 - Pathophysiology of dengue infection

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

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- 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 immuno-pathology, (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, macro phages). 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-a, Interleukin (IL) IL-1b, IL-2, IL-6, IL-8, Interferon gamma (IFNY), 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.

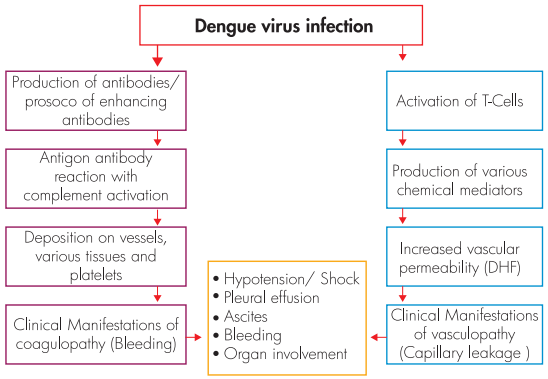

Figure 2 - Flow Chart of Pathophysiology of dengue infection

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 $<100,000/mm^3$).
- 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),
- ingival bleeding (gum bleed), and
- microscopic hematuria.

More serious types of hemorrhage include

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

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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 petechie. A test is considered positive when 10 or more petechiae per 1 inch^2 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 inch^2 with a sensitivity of more than 90%. Sometimes in lieu of petechiae linear steaks 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 hypovolumia.



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 (≤ to 20 mm Hg)
- Hypotension for age
- Cold clammy skin
- Restlessness
- Undetectable pulse and blood pressure

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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.

Laboratory Diagnosis

Unequivocal diagnosis of dengue infection requires laboratory confirmation, either by isolating the virus or detecting dengue-specific antibodies. For virus isolation or detection of DENV RNA in serum specimens by serotype-specific, real-time reverse transcriptase polymerase chain reaction (RT-PCR), an acute-phase serum specimen should be collected within 5 days of symptom onset. If the virus cannot be isolated or detected from this sample, a convalescent-phase serum specimen is needed at least 6 days after the onset of symptoms to make a serologic diagnosis by testing for IgM antibodies to dengue with an IgM antibody-capture enzyme-linked immunosorbent assay (MAC-ELISA).

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.

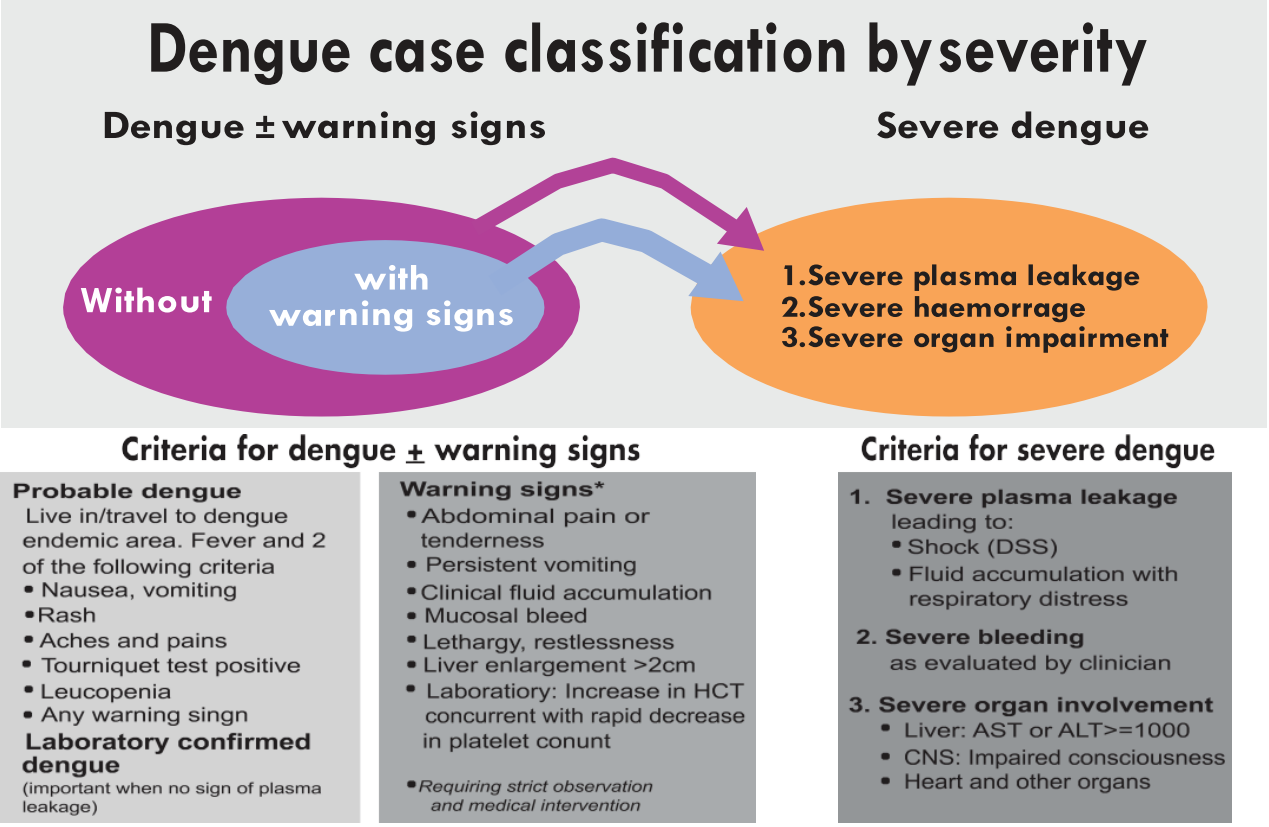

Figure 3 - Dengue case classifications

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

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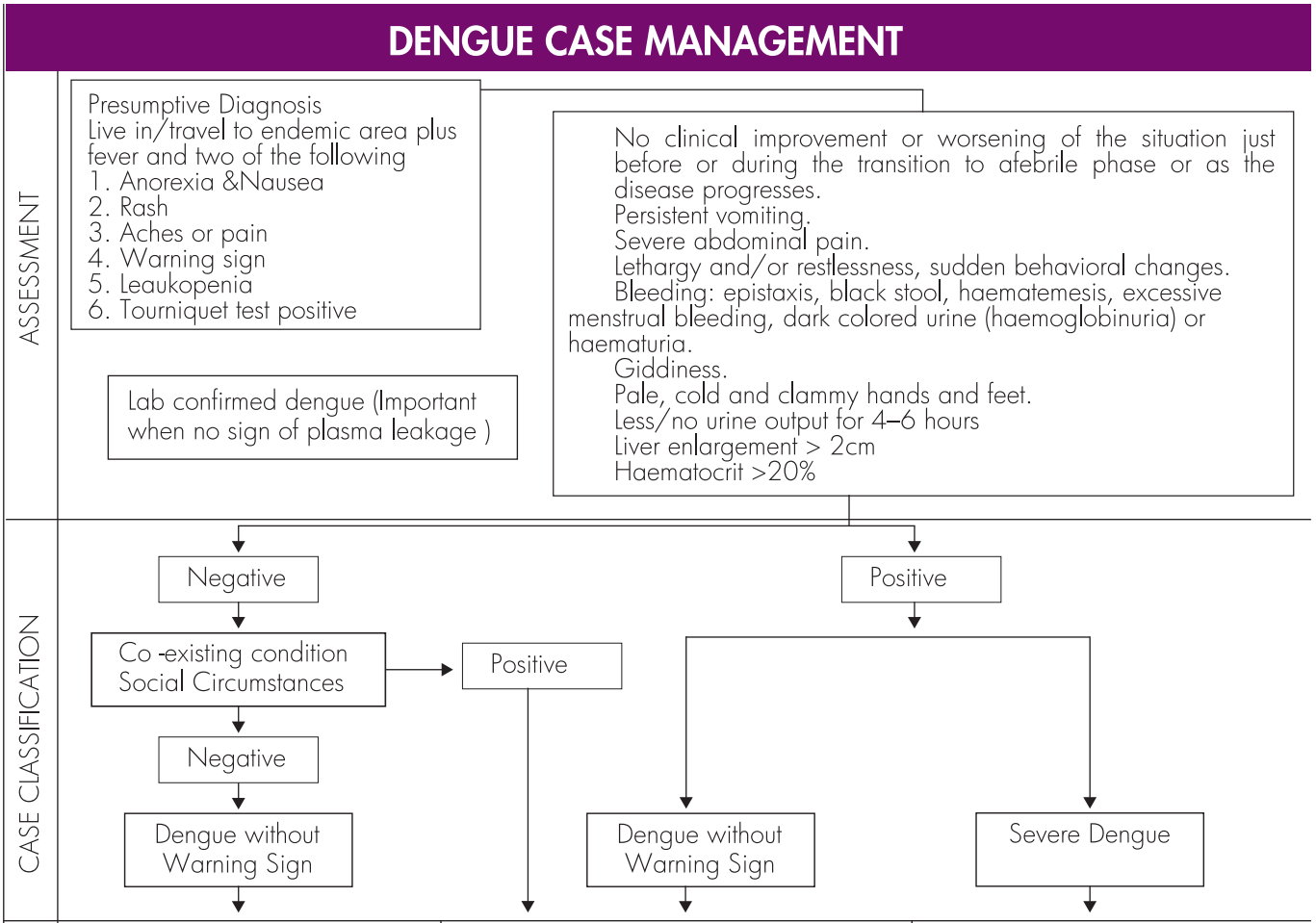
DENGUE CASE MANAGEMENT



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

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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), mefonemic acid, ibuprofen or other NSAIDs • Steroids, Anfibiotics Patients with stable Hct can be sent home	• 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 for1-2hours,then reduceto 3- 5ml/kg/hr for 2-4 hr, and then reduce to 2-3ml/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 1-2hours **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	**Treatment of compensated shock:** • Start I.V. fluid resuscitation with isotonic crystalloid solutions at 5-10 ml/kg/hr over 1hr • 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- 5ml/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 paitent improves • Give acrystalloid/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 7-10ml/kg/hr for 1-2 hours, then back to I.V.crystalloids and reduce rates as above • If condition still ustable, repeat Hct after second bolus • If HCT decreases, this indicates bleeding, see above • If HCT increases/remains high (> 50%) continue colloid infusion at 10-20ml/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 haem- orrhagic complications:** • Give 5-10 ml/kg of fresh packed red cells or 10-20 ml/kg fresh whole blood
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	**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)	
Discharge Criteria: All of Flowing criteria must be present No fever for 48hours Improvement in clinical picture	Increasing trend of platelet count No respiratory distress Stable haematocrit without intravenous fluids	

Table 1 - Dengue Case Management Algorithm

Zinga® Zinc USP • 25 mg Tablet • 100 ml Syrup

Cevalin® Vitamin C • 250 mg Chewable Tablet

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 folowing 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

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.

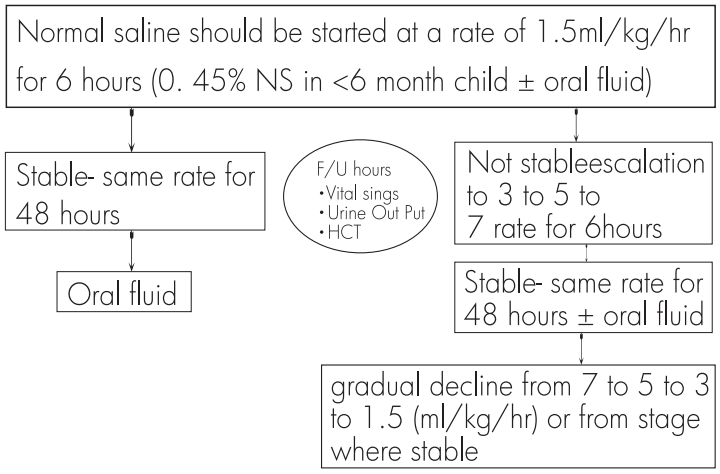
Inpro® Omeprazole
- 20 mg Capsule
- 40 mg Capsule
- 40 mg IV Injection

Panpro® Pantoprazole
- 20 mg Tablet
- 40 mg Tablet
- 40 mg IV Injection

Platelet transfusion is not recommended for thrombocytopenia (no prophylaxis platelet transfusion). The indication of which may be as follows:

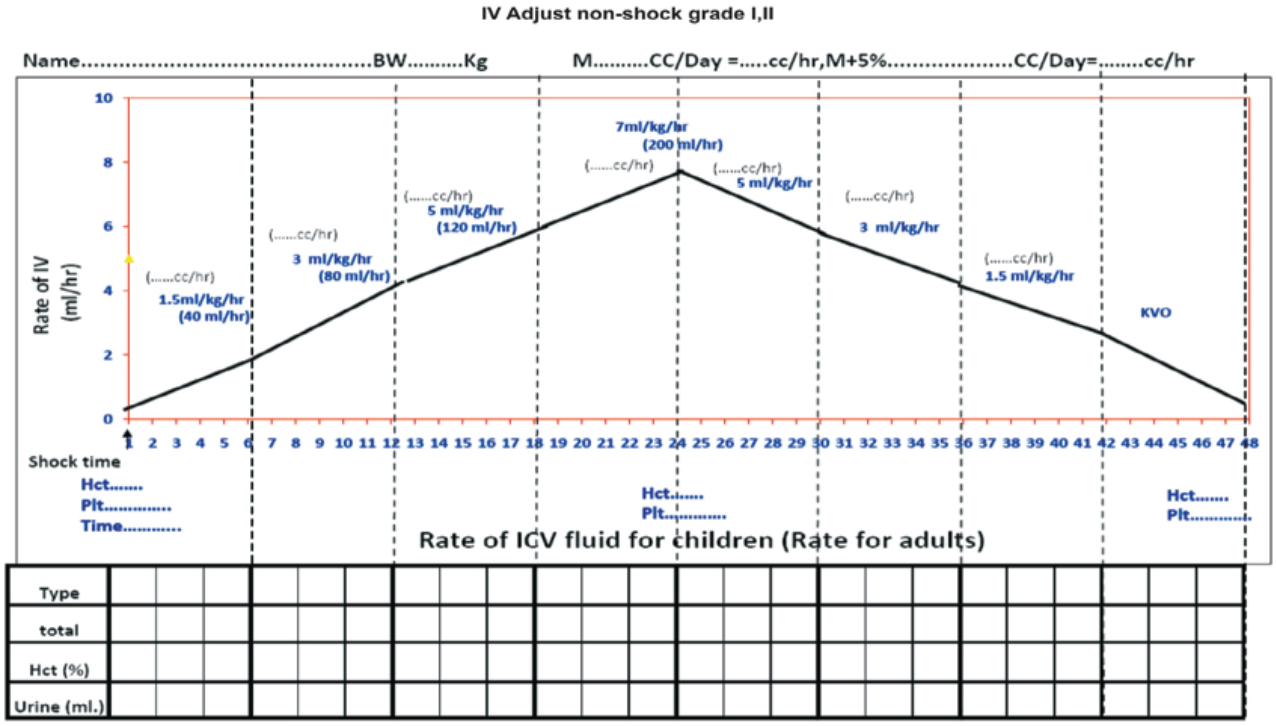
1. Very severe Thrombocytopania who need urgent surgery
2. Clinical judgement of the treating physician

If platelet concentrate is not available fresh whole blood may be transfused as per guidelines given under **DHF management**



Fluid Management- Group B (Children with warning signs)

Example: In a child weighing 10 kg, the starting fluid should be (1.5 x 10) = 15 ml/hr (15 µdrops/min). If needed, escalation should be done @ 3 ml/kg/hr (3x10) = 30 ml/hr (30 µdrops/min), Then 5 ml/kg/hr (5x10) = 50 ml/hr (50 µdrops/min) and subsequently like this.



Rate of IV Fluid for children (Rate for adults)

Figure 4- Fluid Management for Dengue Non Shock

Esogut® Domperidone • 10 mg Tablet
Lactu® Lactulose • 100 ml oral Solution • 200 ml oral Solution

The goals of fluid resuscitation include:

- improving central and peripheral circulation – i.e. decreasing tachycardia, improving BP and pulse volume, warm and pink extremities, a capillary refill time < 2 seconds
- improving end-organ perfusion – i.e. achieving a stable conscious level (more alert or less restless)
- urine output ≥ 0.5 ml/kg/hour or decreasing metabolic acidosis.

Treatment of shock

Compensated shock :

- DSS is hypovolemic shock caused by plasma leakage and characterized by increased systemic vascular resistance, manifested by narrowed pulse pressure (systolic pressure is maintained with increased diastolic pressure, e.g. 100/90 mmHg).
- When hypotension is present, one should suspect that severe bleeding, and often concealed gastrointestinal bleeding, may have occurred in addition to the plasma leakage.
- Most cases of DSS will respond to 10 ml/kg in children or 300–500 ml in adults over one hour or by bolus if necessary further, fluid administration should follow the graph as in Figure 5.
- However, before reducing the rate of IV replacement, the clinical condition, vital signs, urine output and haematocrit levels should be checked to ensure clinical improvement.
- It is essential that the rate of IV fluid be reduced as peripheral perfusion improves; but it must be continued for a minimum duration of 24 hours and discontinued by 36 to 48 hours.
- Excessive fluids will cause massive effusions due to the increased capillary permeability. The volume replacement flow for patients with DSS is illustrated below.

Fluid Overloaded Patient:

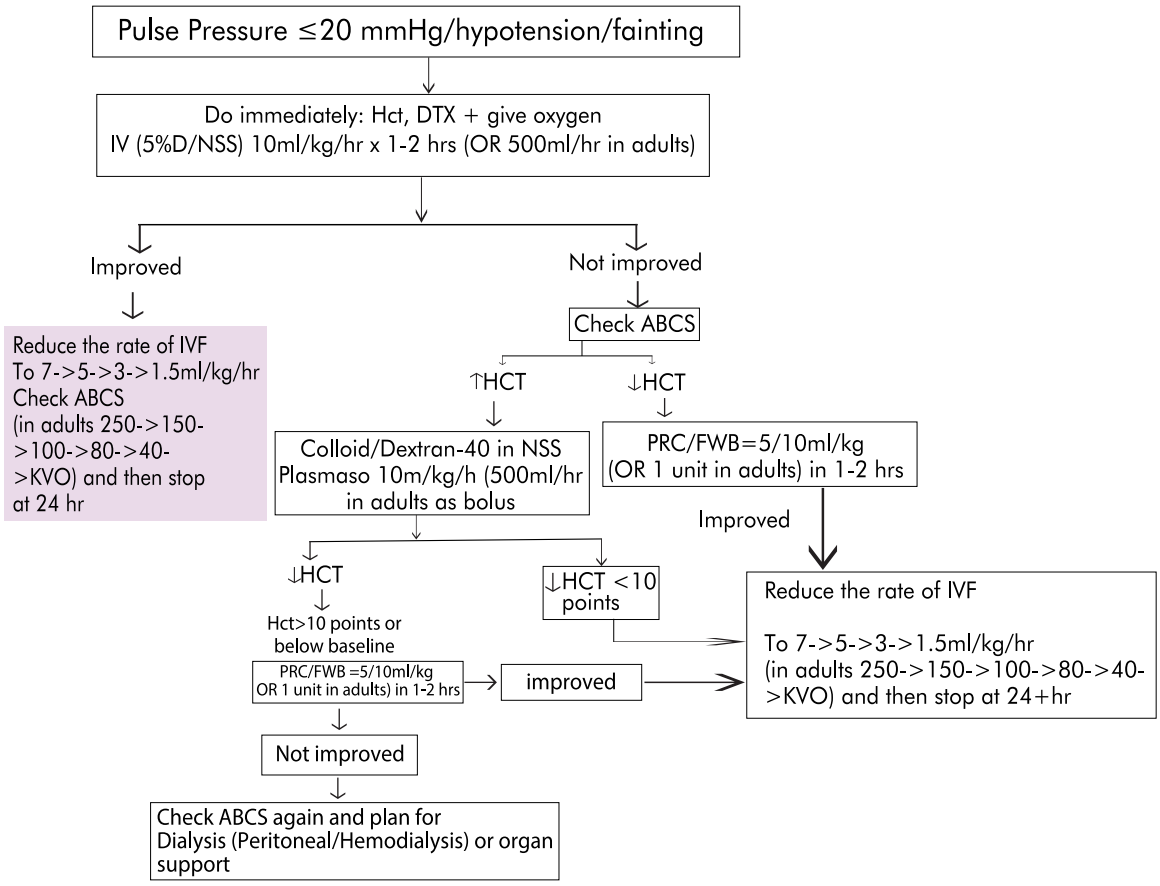
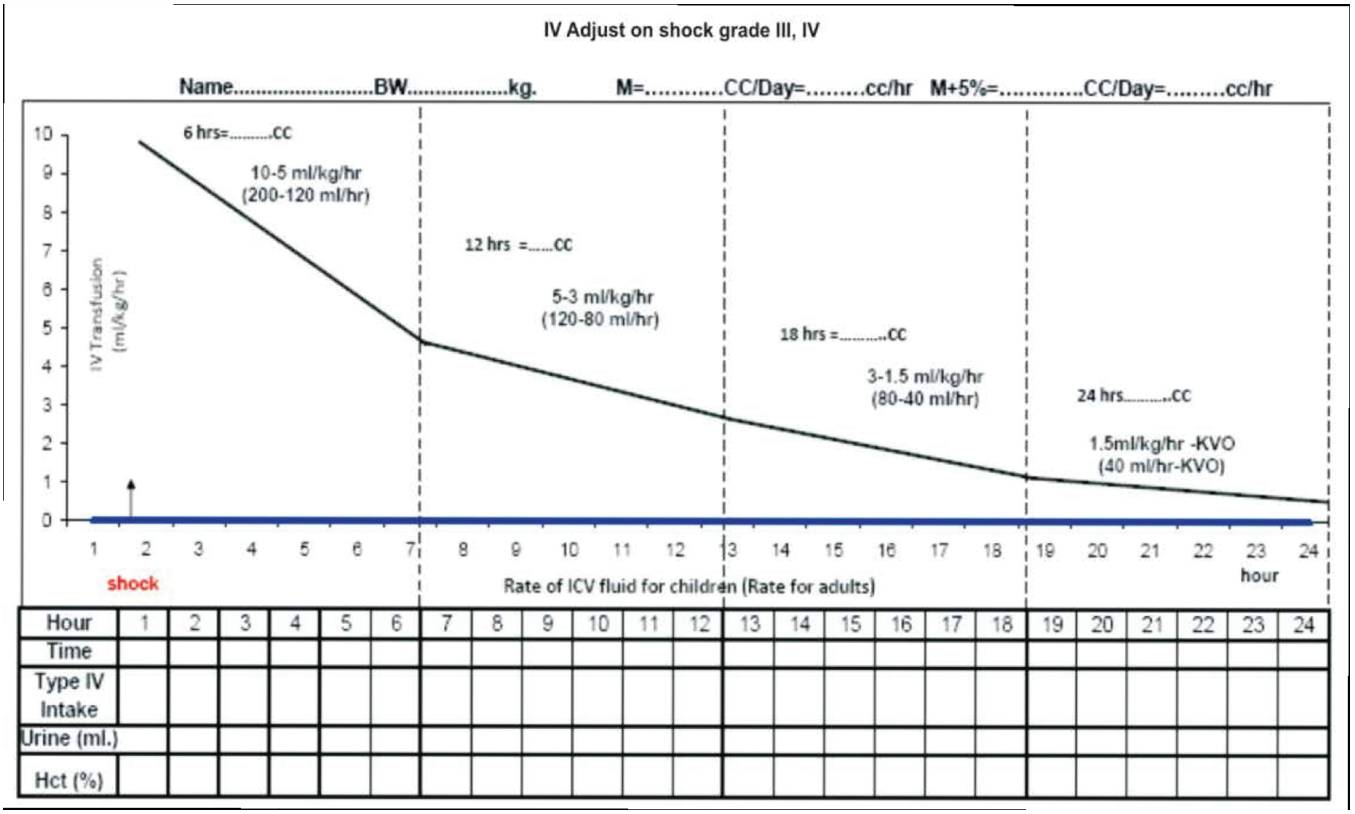


Figure 5 - IV FLUID THERAY for Compensated Shock

Ortho-D3 Cholecalciferol
• 40000 IU Cap • 1000 IU Tab
• 2000 IU Tab • 100 ml Oral Sol
Orthocal Calcium Carbonate
• 500 mg Tablet



Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Time																								
Type IV Intake																								
Urine (ml.)																								
Hct (%)																								

Figure 6 - Fluid Management for Dengue Shock

Some degree of fluid overload is inevitable in patients with severe plasma leakage. The skill is in giving them just enough intravenous fluid to maintain adequate perfusion and at the same time avoiding excessive fluid overload.

Causes of excessive fluid overload:

- Excessive and/or too rapid intravenous fluids during the critical phase.
- Incorrect use of hypotonic crystalloid solutions e.g. 0.45% sodium chloride solutions.
- Inappropriate use of large volumes of intravenous fluids in patients with unrecognized severe bleeding.
- Inappropriate transfusion of fresh-frozen plasma, platelet concentrates and cryoprecipitates.
- Prolonged intravenous fluid therapy, i.e., continuation of intravenous fluids after plasma leakage has resolved (> 48 hours from the start of plasma leakage)
- Co-morbid conditions such as congenital or ischaemic heart disease, heart failure, chronic lung and renal diseases.

Clinical features of fluid overload:

- Rapid breathing
- Suprasternal in-drawing and intercostal recession (in children)
- Respiratory distress, difficulty in breathing
- Wheeze, crepitations
- Large pleural effusions tense ascites, persistent abdominal discomfort/pain/tenderness (this should not be interpreted as warning signs of shock)
- Increased jugular venous pressure (JVP)
- Pulmonary oedema (cough with pink or frothy sputum, wheezing and crepitations, cyanosis) - this may be mistaken as pulmonary hemorrhage
- Irreversible shock (heart failure, often in combination with ongoing hypovolaemia)
- Puffy Face & leg oedema

FUNGATA™ Fluconazole
• 50 mg Capsule
• 150 mg Capsule
• 35 ml PFS
Termider® Terbinafine HCl
• 10 mg Cream
• 250 mg Tablet

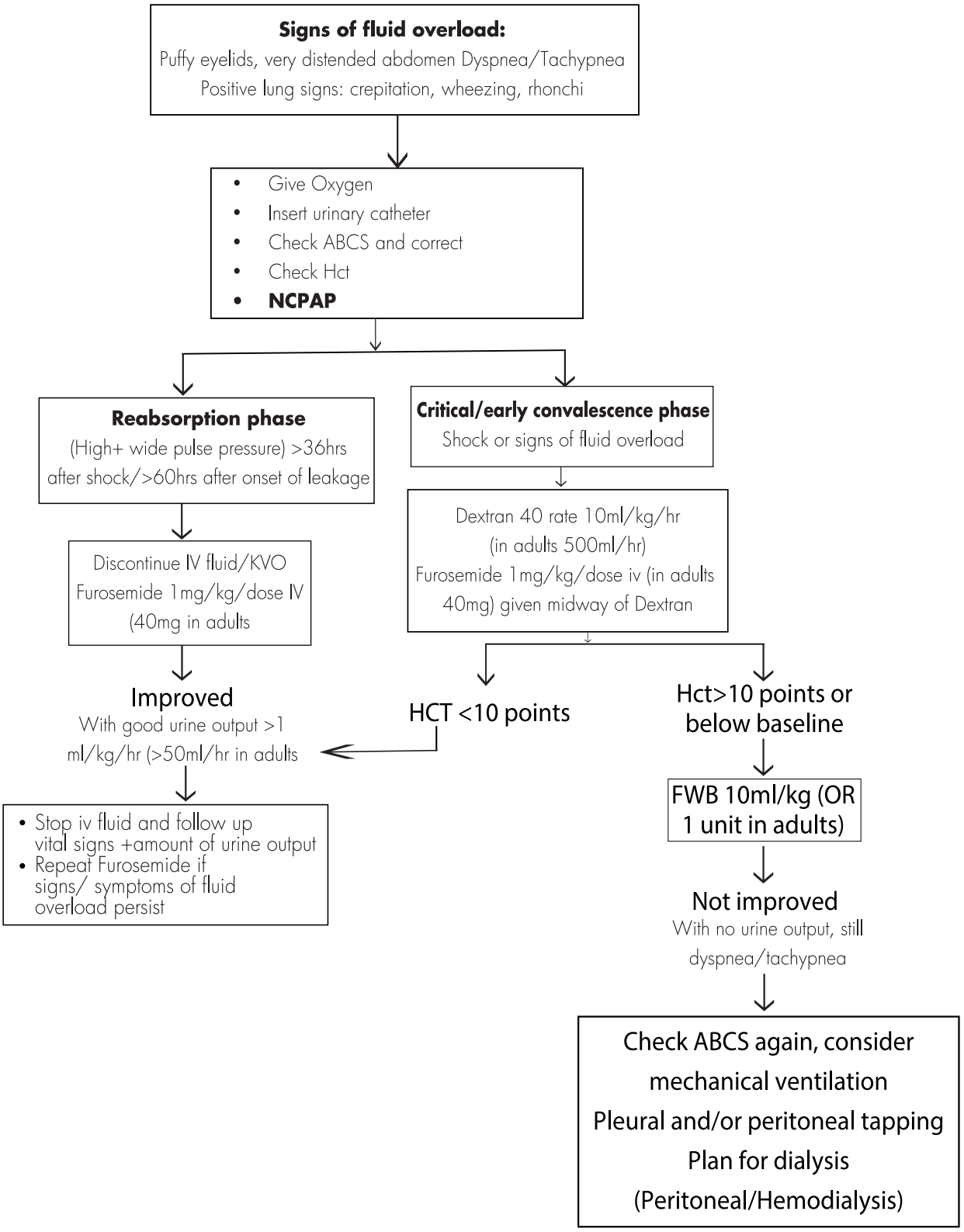


Figure 07 - Flow diagram for the Management of Fluid Overload

Orthorate® Calcium Orotate • Calcium Orotate 400 mg Tablet

Orthocal-D® Calcium Carbonate 500 mg + Vitamin D_3 200 IU Tablet

Additional investigations needed:

- Blood gas and lactate analysis
- Chest X-ray which shows cardiomegaly, pleural effusion, features of heart failure
- ECG to exclude ischaemic changes and arrhythmia
- Echocardiogram for assessment of left ventricular function
- Cardiac enzymes

Management of fluid overload:

- Review the total intravenous fluid therapy and clinical course & check and correct for ABCS.
- All hypotonic solutions should be stopped.
- Switch from crystalloid to colloid solutions as bolus fluids.
- Dextran 40 is effective as 10 ml/kg bolus infusions, but the dose is restricted to 30 ml/kg/day because of its renal effects.

In the late stage:

- Intravenous Furosemide may be administered if the patient has stable vital signs.
- If the patient is in shock, together with fluid overload 10 ml/kg/hr of colloid (dextran) should be given.
- When the blood pressure is stable, usually within 10 to 30 minutes of administer IV 1 mg/kg/dose of furosemide and continue with infusion, dextran infusion until completion.
- Intravenous fluid should be reduced to as low as 1 ml/kg/hr until when haematocrit decreases to baseline or below (with clinical improvement).

The following points should be noted:

- These patients should have a urinary bladder catheter to monitor hourly urine output.

- Intravenous Furosemide should be administered during dextran infusion because the hyperoncotic nature of dextran will maintain the intra vascular volume while furosemide depletes in the intravascular compartment. After administration of furosemide, the vital signs should be monitored every 15 minutes for one hour to note its effects. **If there** is no urine output in response to furosemide, check the intravascular volume status (CVP or lactate). If this is adequate, pre-renal failure is excluded, implying that the patient is in an acute kidney injury state. These patients may require ventilator support soon. If the intravascular volume is inadequate or the blood pressure is unstable, check the ABCS and other electrolyte imbalances. **In cases** with no response to furosemide (no urine obtained), repeated doses of furosemide and doubling of the dose are recommended. If oliguric renal failure is established, renal replacement therapy is to be done as soon as possible. **Pleural** and/or abdominal tapping may be indicated and can be life-saving in cases with severe respiratory distress and failure of the above management. This has to be done with extreme caution because traumatic bleeding is the most serious complication and can be detrimental.

Management of encephalopathy:

- Some DF/DHF patients present unusual manifestations with signs and symptoms of central nervous system (CNS) involvement, such as convulsion and/or coma.

The principal treatment of encephalopathy is to prevent the increase of intracranial pressure (ICP).

Recommendations for supportive therapy for this condition:

- Maintain adequate airway oxygenation with oxygen therapy.

- **ICP by the following measures:** **Give** minimal IV fluid to maintain adequate intravascular volume; ideally the total IV fluid should not be >80% fluid maintenance. **Switch** to colloidal solution earlier if haematocrit continues to rise and a large volume of IV is needed in cases with severe plasma leakage. **Administer** a diuretic if indicated in cases with signs and symptoms of fluid overload. **Positioning** of the patient must be with the head up by 30 degrees. **Early** intubation to avoid hypercarbia and to protect the airway. **May** consider steroid to reduce ICP. Dexamethasone 0.15 mg/kg/dose IV to be administered every 6–8 hours.

- Decrease ammonia production by giving lactulose 5–10 ml every six hours for induction of osmotic diarrhoea. local antibiotic gets rid of bowel flora; it is not necessary if systemic antibiotics are given.
- Maintain blood sugar level at 80–100 mg/dl per cent. Recommend glucose infusion rate is anywhere between 4–6 mg/kg/hour.
- Correct acid-base and electrolyte imbalance, e.g. correct hypo/hypernatremia, hypo/ hyperkalemia, hypocalcemia and acidosis. Vitamin K1 IV administration; 3 mg for <1-year-old, 5 mg for <5-year old and 10 mg for>5-year-old and adult patients.
- Anticonvulsants should be given for control of seizures: phenobarbital, dilantin and diazepam IV as indicated.
- Transfuse blood, preferably freshly packed red cells, as indicated. Other blood components such as as platelets and fresh frozen plasma may not be given because the fluid overload may cause increased ICP.
- Empiric antibiotic therapy may be indicated if there are suspected superimposed bacterial infections.
- H2-blockers or proton pump inhibitor may be given to alleviate gastrointestinal bleeding.
- Consider plasmapheresis or haemodialysis or renal replacement therapy in cases with clinical deterioration.

Ref: 1. https://www.cdc.gov/dengue/healthcare-providers/testing/testing-guidance.html
2.https://brazil.drclas.harvard.edu/files/drclasbraziloffice/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

Fivita Z
Iron polymaltose Complex, Folic acid, Vitamin B complex & Zinc Capsule

Zinga-B
• Tablet Zinc & Vitamin B Complex
• Syrup Zinc & Vitamin B Complex (100 ml)



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

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The MRCS examination has two parts: Part A (written paper) and **Part B** Objective Structured Clinical Examination (OSCE). **You are strongly advised to read the guidance notes below before sitting the MRCS exam.**

Key topics:

- topics and skills that may be examined
- entry requirements
- Part A format, duration and sample questions
- Part B format and duration
- candidate registration and conduct
- marking and results

Syllabus and recommended reading

MRCS content guide: This document provides a full breakdown of the MRCS syllabus and the recommended reading required for the examination. The document also provides essential information on the format of both Part A (MCQ) and Part B (OSCE), sample questions and standard-setting process. **Please Visit:**///C:/Users/USER/Downloads/Candidate%20Guide%20to%20MRCS%20examination%20August%202021%20FINAL-2.pdf

MRCS Part A (MCQ) standard setting process: This document provides information to candidates as to how the standard setting for the MRCS Part A (MCQ) examination is carried out: **MRCS Part A standard setting process- Please Visit:** ///C:/Users/USER/Downloads/MRCS%20Part%20A%20-standard%20setting%20process-1.pdf

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The Part A exam will be a 5-hour MCQ examination consisting of a three-hour paper (Applied Basic Sciences) followed by a two-hour paper (Principles of Surgery in General) - both taken on the same day. The Part A exam will be delivered in partnership with Pearson Vue at their network of computer-based test centres. Further information can be found on the relevant section of this **website** (https://www.intercollegiatemrcsexams.org.uk/error/not-found/?item=%2fmrcs%2fmrcs-part-a-pearson-vue-information%2f&user=imrcs%5cAnonymous&site=IMRCS) that describes the processes involved in delivering the exam with **Pearson Vue**. This document provides candidates with information about the exam proceedings itself including registration, admittance to the exam hall, misconduct and the results-release process. **MRCS Part B OSCE candidate guidance notes and instructions:** These documents provide candidates with information relating to the MRCS Part B exam including the format of the exam, assessment domains, the marking and standard setting process, misconduct regulations, release of results, and how the exam will be run on the day. **Please Visit:** ///C:/Users/USER/Downloads/MRCS%20OSCE%20Exam%20Day%20Guidance%20Notes%20Aug%202021%20Clean-1.pdf. The MRCS Part B will consist of 17 stations assessing the knowledge and skills of the candidate and will last approximately 3.5 hours.

Ref:

https://www.intercollegiatemrcsexams.org.uk/about-the-mrcs-and-mrcs-ent/candidate-guidance/

Mepen® Meropenem
• 500 mg Injection
• 1 mg IV Injection

Winner® Ceftriaxone
• 500 mg IM & IV Injection
• 1 g IM & IV Injection
• 2 g IV Injection

Review

The use of PRP injections in the management of knee osteoarthritis (OA)

Platelet-rich plasma (PRP) for inducing regeneration

PRP is an autologous mixture of highly concentrated platelets and associated growth factors and other bioactive components produced by centrifugal separation of whole blood (Fig.1) that is used in orthopaedic and sports medicine practices to treat bone, tendon and ligament injuries (Fig.2) (Sundman et al. 2014). The growth factors released by PRP have been discussed in great detail within the literature (Lubkowska et al. 2012; Pavlovic et al. 2016; Fernandes and Yang 2016; Parrish and Roides 2018) and have been shown to promote cell recruitment, proliferation and angiogenesis resulting in a reduction in the critical regulators of the inflammatory process and a decrease in the expression of inflammatory enzymes (Table 1) (van Buul et al. 2011). PRP may induce a regenerative response by improving the metabolic functions of damaged structures (Ficek et al. 2011; Chen et al. 2018) and has been shown to have a positive effect on chondrogenesis and mesenchymal stem cell proliferation (Kabiri et al. 2014). In clinical practice, PRP is used to enable the application of autologous plasma and platelet-derived proteins to a desired location with the use of an appropriate scaffold to assist in the repair of the injured tissue (Marx 2001). The rationale for PRP in scaffolds is to take advantage of the huge amount of growth factors contained in platelets to promote cartilage regeneration; however, the use of PRP-augmented scaffolds is still in a preliminary state, with a low scientific level of power (Kon et al. 2013). In application to chondrocytes, growth factors promote matrix synthesis, cell growth and migration and facilitate protein transcription. The supra-physiological release of platelet-derived factors directly at the site of cartilage disease, particularly with interest to knee OA, may stimulate the natural regenerative signalling cascade and enhance the healing of tissue with further mediation of the antiinflammatory response (Mascarenhas et al. 2014). In OA joints, PRP has been shown to affect local and infiltrating cells, mainly synovial cells, endothelial cells, those cells involved in innate immunity (such as macrophages) and cartilage and bone cellular components (Mifune et al. 2013; Dhillon et al. 2017). Additionally, PRP can affect inflammation and angiogenic processes and anabolism and catabolism balance in cartilage formation and alter the existing microenvironment during disease progression (Andia and Maffulli 2013). The combined effects of PRP make it a potential option for management of knee OA, especially as a primary analgesic agent (Meheux et al. 2016). This is due to an increase in proliferation of tenocytes, osteoblasts, mesenchymal stem cells resulting in decreased pain levels postoperatively (Ogino et al. 2006). Despite encouraging preclinical results and increasing clinical interest, there remain multiple questions regarding the clinical application and efficacy of PRP, not least in the production of PRP, which can cause wildly varying characteristics. A simple classification was first proposed in 2009 following the fibrin architecture and cell content (pure PRP: leukocyte-poor PRP, leukocyteand platelet-rich plasma; pure platelet-rich fibrin: leukocyte-poor platelet-rich fibrin, leukocyte- and platelet-rich fibrin). Each of these classifications had different growth factor release profiles (time, concentration) but studies found additional biological signatures and mechanisms within each family (Dohan Ehrenfest et al. 2014). A further classification can be included in the method of application (e.g., injections, glues) and the area of application (e.g., oral/maxillofacial surgery, skin wound healing). A more recent classification system called PAW (platelet, activation, white blood cells) is based upon absolute number of platelets, activation method and presence or absence of white blood cells (DeLong et al. 2012). According to the authors, the specific determination of the components of the PRP is vital in allowing comparisons between studies. In 2016, a further classification was proposed.

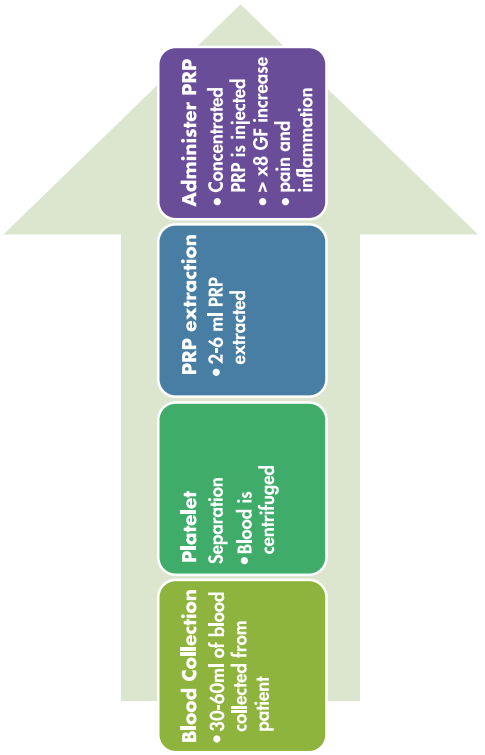

Fig. 1 PRP preparation process

Dialina 5 : 5 mg tablet
Linagliptin INN
Diavil 50 50 mg tablet
Vildagliptin

Magalon et al. (2016) suggested that the dose of injected platelets, the efficiency of the production (percentage of platelets recovered), the purity of the PRP (ratio of platelets, leucocytes and red blood cells) and the activation process were overall termed the DEPA (dose, efficiency, purity, activation) system.

Current use of PRP in musculoskeletal tissues

PRP has been proposed as a promising biologic treatment with a wide range of applications in sports medicine (Lansdown and Fortier 2017). Injury type is significant, with benefits shown in the treatment of patella tendinopathy (Dragoo et al. 2014) and OA (Laudy et al. 2015) but not in Achilles tendinopathy or hamstring injuries (Manduca and Straub 2018). The available clinical studies on PRP as a treatment option suggest a good potential in favouring pain reduction and improved function for articular injuries to the ankle, knee and hip (Engebretsen et al. 2010). The evidence base for PRP across different injury types has been criticised for being inconsistent and uncertain (McNamee et al. 2018). In a meta-analysis, Grassi et al. (2018) advocated PRP treatment as a safe procedure with negligible adverse effects that is readily available and has a minimal risk of reactivity compared to other exogenous compounds owing to the autologous nature of PRP injections. However, existing large and indiscriminate use of PRP injections for the treatment of acute muscle injuries in clinical practice is not justified by evidence (Grassi et al. 2018). Thus, caution should be applied to use in knee OA. In knee OA, PRP injections aim to stimulate cartilage repair and offer relief to other osteoarthritic symptoms, potentially delaying the need for joint replacement surgery. PRP injections have shown to influence the entire joint environment, leading to a short-term clinical improvement (Filardo et al. 2012a, b) with PRP injections being considered a safe procedure with more favourable outcomes when compared to alternative treatments (Laver et al. 2017). PRP is relatively easy to use due to its simple and rapid preparation and the minimally invasive administration requiring a simple intra-articular injection. Adverse effects are likely to be reduced due to the patient's own protein use and bioactive molecules can be concentrated to achieve the desired dosage, also eliminating potential drug interactions (Zhu et al. 2013). Without a synthetic element, PRP is, for the most part, not considered to be a drug or therapeutic substance and does not therefore need to fulfil the regulatory requirements needed for other biologic therapies.

PRP use in knee osteoarthritis

The use of PRP in the treatment of degenerative knee OA has increased in recent years given its apparent high margin of safety and ease of production and administration (Smith 2016). Contrasting scientific evidence exists regarding PRP injections for knee OA, with the efficacy of PRP injections widely reported (Rahimzadeh et al. 2018). The enhanced effectiveness of PRP for pain treatment and knee joint function in comparison to HA or placebo and positive outcomes in all stages of knee OA (early, middle and late), have all been reported (Kanchanatawan et al. 2016; Dai et al. 2017; Cole et al. 2017). In addition, the effects of PRP seemingly last

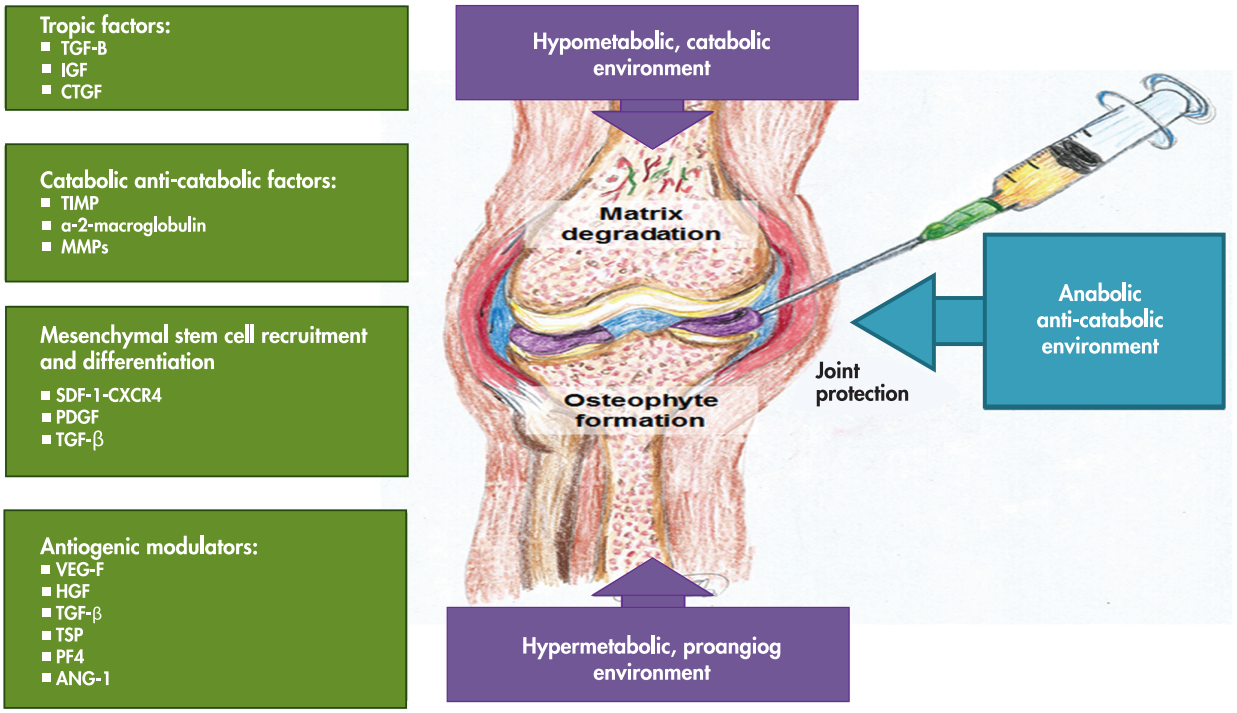

Fig. 2-Clinical applications of PRP

Lexapro Escitalopram
5 mg Tablet
10 mg Tablet
Miramind Mirtazapine
7.5 mg Tablet
15 mg Tablet

Table 1 Commonly discussed growth factors and effects associated with PRP Growth factor Effect

Growth factor	Effect
Platelet-derived growth factor (PDGF)	Angiogenesis; macrophage activation; proliferation and chemotaxis of fibroblasts; collagen synthesis; enhanced proliferation of bone cells`
Transforming growth factor-β (TGF-β)	Fibroblasts proliferation; synthesis of type I collagen and fibronectin; deposition of bone matrix; inhibition of bone resorption
Platelet-derived epidermal growth factor (PDGF)	Epidermal regeneration; promotes wound healing through stimulation of keratinocytes and dermal fibroblasts proliferation; enhanced production and effect of other growth factors
Vascular endothelial growth factor (VEGF)	Vascularisation; stimulation of vascular endothelial cells
Insulin-like growth factor 1 (IGF-I)	Fibroblasts chemotaxis; protein synthesis stimulation; enhanced bone formation
Platelet factor 4 (PF4)	Enhanced influx of neutrophils; chemoattractant for fibroblasts
Epidermal growth factor (EGF)	Cellular proliferation and differentiation
Hepatocyte growth factor (HGF)	Inhibition of NF-κB transactivation activity; anti-inflammatory action through inhibition of monocyte-like chemotaxis
Stromal-cell-derived growth factor-1α (SDF-1α)	Supports primary adhesion and migration of progenitor cells

Modified from (Engebretsen et al. 2010)

longer and are superior in comparison with intramuscular injection therapies (Prieto-Alhambra et al. 2014). Comparisons between intra-articular injection of PRP and placebo and HA therapy in mild and moderate knee OA have generally shown higher clinical outcome scores with PRP use (Filardo et al. 2012a, b). Similarly, using meta-analysis to compare the efficacy of PRP injections against placebo or other therapeutic means for the treatment of knee OA (Bennell et al. 2017) has reported greater pain reduction (Laudy et al. 2015) and functional improvement (Chang et al. 2014) with the use of PRP. However, this is at the expense of an increase in nonspecific adverse events (Khoshbin et al. 2013). PRP use has been advocated as a treatment option in all stages of knee OA. Intra-articular PRP injections in active patients with knee OA show significant improvements in pain reduction, improved symptoms and quality of life QoL (Gobbi et al. 2012). This could be due to the immediate and sustained release of growth factors over a prolonged period, which enhances healing resulting in sustained clinical effects (Dhillon et al. 2017). Symptomatic relief for up to 12 months with increased benefits to patients with early knee degenerative changes has been found (Campbell et al. 2015) with significant improvements in function and reductions in pain with three injections per month yielding significantly better outcomes in the shortterm (Huang et al. 2017). Improved pain outcomes after 3 months with a greater effect in lower OA grades have been reported (Montañez-Heredia et al. 2016). In moderate knee OA, functional status and pain have improved with a minimum of two injections (Kavadar et al. 2015). In late-stage knee OA, it may be that only a single PRP intra-articular injection is required to provide effective pain relief, thus improving activities of daily living and QoL (Joshi Jubert et al. 2017). Research into the efficacy of PRP has focused on comparing the effects of intra-articular PRP injections to other injection therapies. In many studies, PRP injections have improved functional outcomes when compared to hyaluronic acid (HA) and placebo controls and appear more efficacious in reducing symptoms and improving QoL (Raeissadat et al. 2015; Kanchanatawan et al. 2016). Kon et al. (2011) examined three homogenous groups of patients treated with three injections of PRP, low molecular weight HA and high molecular weight HA and concluded that autologous PRP injections have longer efficacy than HA injections and enhance articular function. The results showed improved outcomes for the PRP group at 6 months with younger and more active patients achieving better results with a low degree of cartilage degeneration (Meheux et al. 2016). Conversely, PRP causes a significantly greater acute inflammatory response and an increase in synoviocyte cell death (Braun et al. 2014) and induces more transient reactions than HA (Riboh et al. 2016). Spaková et al. (2012) compared three PRP injections with three HA injections in a randomised controlled trial (RCT) on 120 patients and discovered better Western Ontario and McMaster Universities Arthritis Index (WOMAC) scores and Numerical Rating Scale (NRS) in the PRP group compared to the HA group (Table 3). In a separate RCT with 120 patients, Cerza et al. (2012) compared four PRP injections at 1-week intervals with low molecular weight HA and observed better improvement of WOMAC scores at 24 weeks in the PRP group. No correlations with the grade of OA were found in either study. Additionally, better WOMAC scores were achieved at 24 weeks using PRP by

Table 3 Methods to assess impact of clinical intervention

Outcome measure	Function
Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)	Assesses pain, stiffness and physical function. Consists of 24 items divided into 3 subscales: • Pain (5 items): during walking, using stairs, in bed, sitting or lying and standing • Stiffness (2 items): following waking and later in the day • Physical function (17 items): stair use, rising from sitting, standing, bending, walking, getting in/out of a car, shopping, putting on removing socks, rising from bed, lying in bed, getting in/out of bath, sitting, getting on/off toilet, heavy household duties, light household duties
Lequesne	Assesses the effectiveness of therapeutic interventions. Sections for index: 1. Pain or discomfort 2. Maximum distance walked 3. Activities of daily living
EQ-VAS	Patients' self-evaluation of overall health. 0 (worst possible health) to 100 (best possible health)
International Knee Documentation Committee (IKDC) Questionnaire	Subjective overall function score. Questionnaire looks at 3 categories: • Symptoms • Sports activity • Knee function Symptom subscale assists evaluation of pain, stiffness, swelling and giving-way of the knee. Sports activity subscale focuses on functions such as ascending and descending stairs, rising from a chair, squatting and jumping.

Sánchez et al. (2012) who examined 126 patients in a RCT with different grades of OA and compared three PRP injections at 1-week intervals with HA. Similarly, better outcomes have been documented when comparing PRP to HA groups at 6 months (Li et al. 2011; Say et al. 2013). Patel et al. (2013) compared normal saline with PRP and demonstrated that PRP significantly improved WOMAC scores following 6 months in comparison to the placebo groups, with patients experiencing benefits as early as 18 days. In a follow-up study, Patel and Dhillon (2014) hypothesised that the anti-inflammatory effect and chondral remodelling induced by PRP could be the reason for the improved clinical effects.

Ref.: https://link.springer.com/article/10.1007/s00441-019-02996-x

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Dr. Lokiat Ullah received an Award on behalf of Biopharma Ltd. for Quality products manufacturer; Title: "**Golden Europe for Quality**".



On Wednesday, October 30, 2024 Dr. Lokiat Ullah, hon'ble Managing Director & CEO is receiving "CEO Award" from HIS EXCELLENCY SERDARMAMMET GARAJAYEV, Embassy of Turkmenistan, organized by Global Well Respected CEO Awards & Conferences, Ghana at Crowne Plaza Hotel, Dubai.



Dr. Lokiat Ullah, Hon'ble Managing Director of Biopharma Ltd. is celebrating Mr. Mohammed Amirul Islam, Mayor of Enfield Council, London. He is the first Bangladeshi born Mayor in the history of Borough. We wish him sound health and a successful mayoral journey.



Dr. Lokiat Ullah, Managing Director of Biopharma Limited participated at "INTERNATIONAL INVESTORS SUMMIT 2024" in Lisbon, Portugal on February 15, 2024. Her excellency Ms. Rezina Ahman, Ambassador of Bangladesh to Portugal (just left to Dr. Lokiat Ullah) and Business Entrepreneurs from Bangladesh (Kanij Fatima, Founder of Probashi Sheba Ltd, Md. Khairul Karim Antu, Managing Director of Pentagon International Limited, Sayeda Akhter, Managing Director, I-Ma group, Tanjina Moonmoon, Director of Konna Wellbeing Limited, Md Sakib Hossain, Founder, Fashol Dotcom Limited, Md. Mahibullah Shahin, Proprietor, Manha Enterprise, Mohammad Nizam Uddin, Managing director, Traditional Dress Code Ltd. were also participated at this summit.



We are giving crest and gifts to Mr. Mohamed Mire, Investment Advisor of Somaliland and Managing Director of Cure Solution Bureau, UK and Muhammad Islam, Deputy Mayor, Enfield, UK. at Hotel Westin, Gulshan, Dhaka.



A Memorandum of Understanding (MOU) has been signed between Biopharma and Somaliland company to expand business in Somaliland. Dr Lokiat Ullah, Managing Director of Biopharma, Mr Mohammed Mire, Investor Advisor of Republic of Somaliland, and Muhammad Islam, Deputy Mayor, Enfield, UK signed the Agreement on each side.

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Amoxicillin & Clavulanic acid
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Hon'ble Managing Director Dr. Lokiat Ullah With all Participants from renowned Pharmaceutical Companies in Bangladesh at Ethio Health Exhibition & Congress, 2022 in Addis Ababa, Ethiopia. This Exhibition was held on 03-05 March 2022. It is the largest International Healthcare and Trade professionals gathering in Ethhiopia.



Hon'ble Managing Director Dr. Lokiat Ullah received an Award as "Greatest brand-2018" at Hotel Marina Bay Sands, Singapore on 21 st January 2019.



On behalf of Biopharma Limited, Mr. Harisur Rahman, Sr. Assistant Manager, International Business and Mr. Abu Hanif , Sr. Executive, International Business are receiving "Asian Excellence Achievers Award" at Hotel Pagoda, Kathmandu, Nepal on November 08, 2024.



We are handling over the crest to Ms. Betty Kitta Scopas, Director of Early Warning System, Ministry of Humanitarian Affairs and Disaster Management, and Dr. Not Bol Nyuar, Undersecretary, Republic of South Sudan at Hotel Intercontinental, Dhaka.



Handing over diary of 2024 to Ms. Thuy, First Secretary, Embassy of Vietnam, Bangladesh on behalf of Biopharm Ltd. Vietnam is one of our Export-destination country since 2010.



Handing over diary of 2024 to Mr. Abdul Rahim Oraz, Hon'ble Ambassador of Afghanistan to Bangladesh on behalf of Biopharm Ltd. Afghanistan is one of our Export-destination countries since 2009.

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Mexclav™ Cefuroxime & Clavulanic Acid
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• 500 mg Tablet



Dr. Lokiat Ullah, Honorable Managing Director of Biopharma Limited & Bio Group, legend, entrepreneur and one of the policy makers of Bangladesh Pharmaceutical Industries is exchanging courtesy with Dr. Muhammad Yunus, entrepreneur of Mirco-economics, Nobel laureate and hon'ble chief advisor to the interim government of Bangladesh in a pleasant atmosphere.



Biopharma Limited received the first prize "National Productivity and Quality Excellence Award" and "Institutional Appreciation Award" as the best industrial pharmaceutical company in medium industrial organization category. The Managing Director of Biopharma Limited received the award. Members of the Board of Directors - Honorable Chairman of Biogroup Dr. Shahab Uddin Ahmed Chowdhury & Vice Chairman Dr. Anwarul Azim congratulated Dr. Lokiat Ullah, Managing Director.



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'.



Biopharma Ltd organized various programs on 20 September 2024 for doctors and students to the 67th foundation anniversary of Chittagong Medical College.



On the 67th founding anniversary of Chittagong Medical College, Managing Director of Biopharma Ltd. Dr. Lokiat Ullah presented gifts to all doctors who won.



National Doctors Forum, Cox's Bazar organized a farewell ceremony program for Intern Doctors on 28 September 2024. The renowned medicine company Biopharma Ltd was sponsored in this program.

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Obeticholic Acid 5 mg & 10 mg Tablet
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UDCA™
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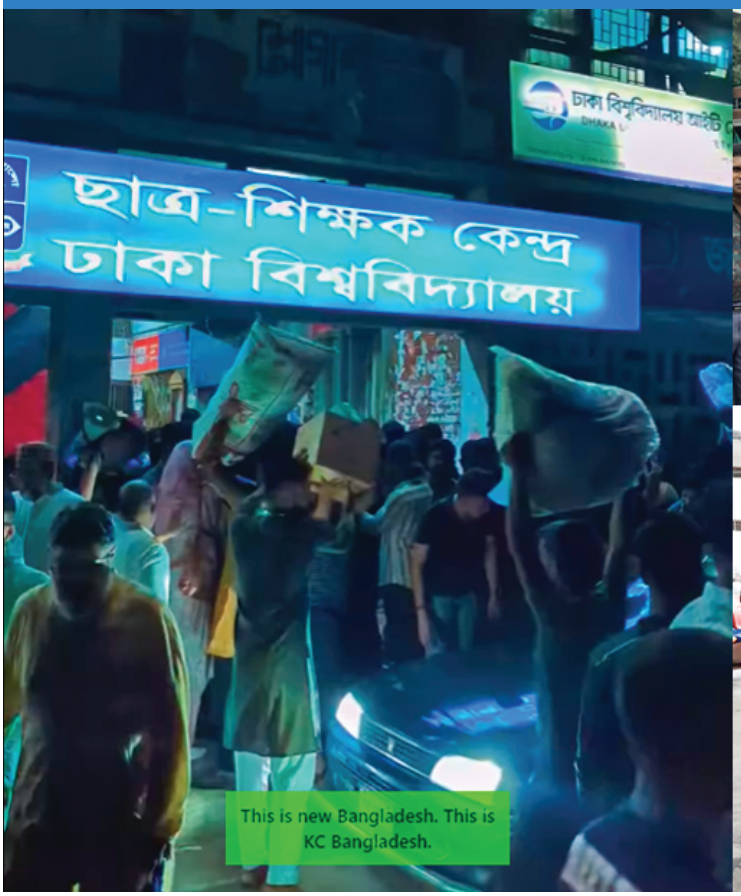
ছাত্র জনতার আন্দোলনে "যোদ্ধা শহীদদের" প্রতি বায়োফার্মা পরিবারের পক্ষ থেকে জানাই আন্তরিক ভালবাসা ও শ্রদ্ধা। ছাত্র জনতা সবাই কাজ করেছে একসাথে, গড়েছে- এক নতুন বাংলাদেশ। এমন বাংলাদেশ ও ঢাকা বিশ্ববিদ্যালয় বিশ্ব আর কখনো দেখেনি। আমার আপনার সবার প্রিয় বাংলাদেশ। "এগিয়ে যাও বাংলাদেশ"।







Biopharma Limited was born with a slogan "Committed to Serving Mankind". Alhamdulillah!!! In continuation of that, all the officers and employees of the Biopharma family have donated their 01 day's salary to the flood affected people of the country. Biopharma Limited handed over relief aid and medicines to the leaders of the anti-discrimination student movement at Student-Teacher Centre, Dhaka University on 25 August 2024.



In memory of the martyrs of the July uprising, a treason song and qawwali evening was held at Shaheed Suhrawardy Medical College. It was organized by the students at the medical auditorium on Tuesday (October 8, 2024). Biopharma Limited organized a special raffle draw for students and doctors on the occasion.



While the patriotic student society controlled the traffic system with the Ansars, Biopharma Ltd. distributed Vitamin-Cevalin, Bio Tasty Saline, Aceta (Paracetamol), and head caps at all the traffic junctions of Dhaka city to encourage the students.



The 33rd Annual Conference and Scientific Seminar of APB was celebrated on (1s & 2nd June), 2024. Biopharma was proud to participate in this auspicious program.



The Ophthalmological Society of Bangladesh (OSB) is one of the most prestigious organizations of Ophthalmologists in Bangladesh. They organized a conference every year. On March 2024 the 51st OSB conference was held in BSMMU Convention Hall with the participation of more than a thousand ophthalmologists from countrywide and also from different nations. A number of renowned ophthalmologists visited Biopharma's Stall of Biovision. The stall was full of participating doctors and their family members in different games and activities.



The 8th International Hepatology Conference was held on November 28, 2024, at the Pan Pacific Sonargaon Hotel in Dhaka, Bangladesh, which was organized by the Hepatology Society. Biopharma Limited contributed to the 8th International Hepatology Society Conference in Dhaka.



30 October; 2024-World Stroke Day, was organized by the Neurosurgery Department in (BSMMU), Dhaka. Prof. Dr. Md. Sayedur Rahman, Vice-Chancellor (BSMMU) was present as a Chief Host. Biopharma Limited was sponsored to celebrate this Day.



In collaboration of Cumilla Doctors Forum of Lalmai & Shikari Para Baitul Qur'an Madrasha, Lalmai,Cumilla organized a free medical camp and distributed free medicines on 31st October '2024. 35 eye specialist were present in this camp. Biopharma Limited co-operated in this medical service camp.



Biopharma Ltd was celebrated World Heart Day with some of the renowned cardiologist on 29th September' 2024.

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●100 ml Syrup
Esogut
Domperidone
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• 60 ml Suspension
• 15 ml PD

Best Regards From Biopharma Ltd



National Doctors Forum, Chittagong organized Warm Greetings to the Intern Doctors on 29 September 2024. The program was sponsored by renowned pharmaceutical company Biopharma Ltd.



Prof. Dr. MA Khalek (MBBS, MCPS, D-Card, MD), newly appointed as Councilor of Bangladesh Medical and Dental Council, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited.



Prof. Dr. Md. Rais Uddin Mondol (MBBS, FCPS (Medicine), MD (Cardiology), Fellow (WHO), Professor & Head of Cardiology Department, Rajshahi Medical College and Hospital), newly appointed as councilor of Bangladesh Medical and Dental Council, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited.



Prof. Dr. Md. Shahinul Alam, FCPS (Medicine), MD (Hepatology) newly appointed as Vice Chancellor of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited.



Prof. Dr. Sajeed Abdul Khalek (MBBS, MS, Ophthalmologist & Phaco Surgeon), newly appointed as the Principal of Ibn Sina Medical College, Dhaka, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited. Md. Shah Paran, Senior Assistant Manager, Product Management Department & Md. Shah Alam, RSM Dhaka-A were present at this moment.



Dr. Kazi Mohiuddin, newly appointed as Vice Principal at Islami Bank Medical College and Hospital, Rajshahi, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited. Professor Dr. Kofil Uddin, Head of neuromedicine department, was join at this moment.

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Dr. Md. Al-Mamoon, MBBS, BCS (Health), FCPS (Course), PGT-Cardiology, promoted as Assistant Director at Shaheed Ziaur Rahman Medical College, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited.



Dr. Golam Rasul Sir and Dr. Mahbubur Rahman Saheen Sir received floral greetings and mementos. Medicine Today creates opportunities to publish their articles. It is a BM&DC-recognised professional medical journal, published twice a year. It is available at Asian Digital Library, Banglajol. Medicine Today is sponsored by the Biopharma Foundation.



Professor Dr. Shaila Nazneen, newly appointed as the Principal of Chandpur Medical College, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited. Deputy Sales Manager of Biopharma Ltd. Md. Abul Khair, RSM Niamat Ullah Sohel at Chandpur Region, and other colleagues were present at this moment.



Professor Dr. Sheikh Sadek Ali, newly appointed as the Principal of Dinajpur Medical College, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited. Mr. Delwar Hossain, the General Manager of the Product Management Department, Dinajpur regional sales manager, team leader, and other colleagues were also present at the congratulation.



Dr. Md. Abul Fazal, DCH, FCPS, (Paediatrics Specialist), promoted as Associate Professor at Shaheed Ziaur Rahman Medical College & Hospital, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited.



Dr. Md. Akhtarul Alam Azad, MBBS, BCS (Health), DDV., promoted as Associate Professor at Pabna Medical College & Hospital, was greeted and congratulated by officials of Biopharma Limited on behalf of Dr. Lokiat Ullah, the Hon'ble Managing Director of Biopharma Limited.

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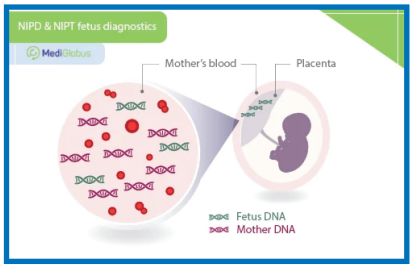
Innovations 2023 Produced In Diagnostics

Non-invasive prenatal diagnostics

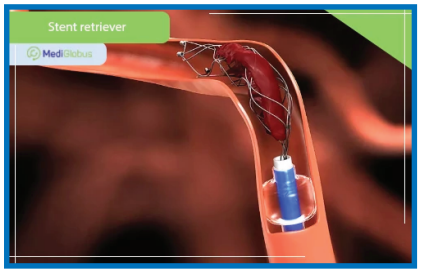
A new method of foetal genetic diagnosis (NIPD & NIPT) can assess the risk of more than 100 genetic diseases, determine the sex and blood type of the unborn child, and confirm paternity non-invasively. Standard protocols use amniotic fluid analysis for this purpose, which is normally tolerated by most women, but can lead to miscarriage in high-risk pregnancies. The new technology can "capture" small samples of foetal DNA from the mother's blood for analysis. This is a completely safe and reliable diagnostic method. In addition, non-invasive prenatal diagnostics can be used to perform a paternity test in the first trimester of pregnancy, starting at week 7. The duration of the test in most laboratories takes an average of a week. An important point is that prenatal diagnosis by blood test can only be carried out in the case of a single pregnancy. If there are twins, the mother's bloodstream will contain cells from both children, which cannot be separated from each other in the laboratory. Who can benefit from this? Women with a high-risk pregnancy.



New Medical Technologies Developed In 2023

Stents 'treating' patients after stroke

Stent retrievers have been revolutionising the treatment of stroke patients for the last few years. The market for these devices has doubled in 2023. These are special devices that look like a catheter made of a thin mesh material that is placed along the blood vessels to the area where the neurovascular disease has occurred and removes blood clots. The use of stent retrievers in the first 2-7 hours after a stroke dramatically reduces the risk of stroke recurrence and reduces long-term damage to brain tissue. The rehabilitation period for these patients becomes shorter and easier. Modern clinics are combining stent retrievers with drug therapy, neuroprotective agents and even stem cell treatment to further accelerate the neurorehabilitation process. Who can benefit from this? People who have risk factors for stroke: age 55+, high blood pressure, history of heart disease and transient ischaemic attack, arrhythmia, high blood cholesterol, diabetes and obesity, smoking, etc.



Neurofeedback systems for prosthetic limbs

Neurofeedback systems can mimic the natural nerve function of amputation patients to help them adapt to the use of prosthetic limbs. These devices "collect" information about the pressure on the robotic foot while walking and transmit it to electrodes specially implanted in the peripheral nerves on the residual limb. The information from there goes to the brain, just as it would during the natural process of walking in a healthy person. The brain reads it and reacts accordingly, resulting in more precise coordination of whole-body movements. Patients with prosthetic legs who use neurofeedback devices can walk and climb stairs faster and with greater confidence, and their movement accuracy increases by 20%. Patients with prosthetic arms have improved fine motor skills: for example, they can pick up small and fragile objects more easily. Who can benefit from this? People who have had a limb amputated.



Technology for remote monitoring of glucose levels in diabetics

During the 2023 Annual Conference of the Association for Advanced Technology and Diabetes (AATD), the medical community shared two promising methods for non-contact glucose measurement in diabetic patients. These were breath analysis and glucose measurement using light (Rama spectroscopy). These innovations eliminate the need for continuous blood draws. Patients get real-time results, providing better control over their condition. Such technologies have been available in the scientific world for a long time, but they can only be performed in large laboratories. The innovation comes in the development of small devices that patients can carry around with them, and which will still provide as accurate and reliable results as previously available methods of measuring glucose levels. Both technologies are already undergoing practical trials,



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Lirica® Pregabalin
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• 50 mg Capsule
• 75 mg Capsule

and the researchers boast optimistic preliminary results. Who can benefit from this? Patients with diabetes, especially type 1 diabetes.

Gene Therapy Advencements In 2023

First gene therapy to treat Duchenne myodystrophy

The possibility of "removing" the disease from patients' DNA has long been hotly debated in the medical community, but the complexity and sensitivity of such a treatment have long stood in the way of its introduction into everyday practice. And now in 2023, the first shift in the future of gene therapy has occurred – the FDA has approved the first-ever gene modification drug to treat children with Duchenne myodystrophy, a dangerous disease that leads to degeneration of muscle tissue and premature death due to impaired production of a vital protein. Gene therapy finds the stretch of DNA responsible for the formation of this protein and "fixes" it. The drug uses CRISPR/Cas9 technology to edit genes. This technique is famous for the fact that its researchers won the Nobel Prize in Chemistry in 2020. Who can benefit from this? People whose families inherit the Duchenne myodystrophy gene.

The first gene therapy to treat sickle cell anaemia

Just like the previous technique, gene therapy for sickle cell anaemia uses CRISPR/Cas9 technology to edit genes. The gene therapy, called CASGEVY, corrects defective haemoglobin genes in the patient's bone marrow stem cells so that they can produce complete haemoglobin. The patient's stem cells are taken from their bone marrow, edited in the lab, and then injected back into the patient. A single treatment has the potential to completely cure the disease. Previously, the only way to completely cure sickle cell anaemia was a bone marrow transplant. However, a big problem with this approach is finding suitable bone marrow donors. Gene therapy has the potential to remove this obstacle. Who can benefit from this? People whose families inherit the gene for sickle cell anaemia.

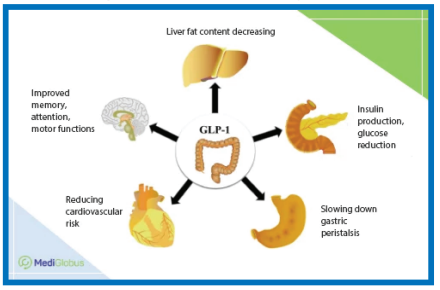
The Most Innovative Drugs To Emerge In 2023

New drug for Alzheimer's patients

Alzheimer's disease is one of the most common neurodegenerative diseases characterised by consistent memory loss, impaired thinking, personality changes and emotional disturbances. This disease cannot be cured and all therapeutic approaches are aimed at slowing progression. In the summer of 2023, the FDA approved a new drug, Lekembi (lecanemab). This is the first drug that treats the cause of Alzheimer's disease – the accumulation of amyloid plaques in brain tissue. They provoke inflammatory processes and disrupt the connections between neurons, which leads to memory impairment and other symptoms of the disease. Lekembi belongs to a group of drugs called monoclonal antibodies. It is a type of targeted therapy, in other words, drugs that have a targeted effect on selected disease-causing cells. The drug destroys existing plaques; however, it cannot prevent the formation of new ones, so a complete cure cannot yet be achieved. A study published in the Journal of the American Medical Association (JAMA) showed that the use of Lecembi slows the development of Alzheimer's disease by 35% in the early stages of the disease. The drug has certain risks of side effects and will not be effective for late-stage disease, but those to whom this medicine can be recommended benefit greatly from its use. Who can benefit from this? Patients or relatives of patients with Alzheimer's disease.

A drug that can be used to treat obesity

Obesity is a complex metabolic problem that carries an increased risk of a large number of diseases, including cancer. According to WHO, it affects more than 39% of the world's population. The standard treatment plan for obesity – physical activity and diet – requires a lot of effort and motivation on the part of the patient, and not everyone manages to stick to a healthy lifestyle. In 2023, doctors started using a new group of drugs that can help with this problem – GLP-1 agonists. These are synthetic drugs similar in structure to the human hormone glucagon-like peptide-1, which is produced in the gut. It causes a feeling of satiation, as well as slows digestion and lowers blood sugar levels. These drugs were originally developed to treat type 1 diabetes, but this year doctors revealed that they have many benefits for regular obese patients as well. Specifically, the use of GLP-1 agonists improves heart function and reduces the risk of heart attack and stroke by 20%. In addition, interim results are available suggesting that these drugs may also protect against kidney disease and reduce cravings for smoking and alcohol. And all of this is accompanied by overall weight loss, which in itself has a healthy effect. Who can benefit from this? People with obesity and/or type 1 diabetes who are unable to control their weight within the recommended range.



Ref. https://mediglobus.com/medical-achievements-in-2023/#technology

BiovitGold™ • 15's Tablet • 30's Tablet

Biovit Silver™ Super 31 Vitamins+ Minerals • 15's Tablet • 30's Tablet

FDA Novel Drug Therapy Approvals for 2024*



No.	Drug Name	Active Ingredient	Approval Date	FDA-approved use on approval date*
44.	Bizengri	zenocutuzumab-zbco	12/04/2024	To treat non-small cell lung cancer and pancreatic adenocarcinoma
43.	Iomervu	iomeprol	11/27/2024	For use as a radiographic contrast agent
42.	Rapiblyk	landiolol	11/22/2024	To treat supraventricular tachycardia
41.	Attruby	acoramidis	11/22/2024	To treat cardiomyopathy of wild-type or variant transthyretin-mediated amyloidosis
40.	Ziihera	zanidatamab-hrii etzadroxil, probenecid	11/20/2024	To treat unresectable or metastatic HER2-positive (IHC 3+) biliary tract cancer
39.	Revuforj	revumenib	11/15/2024	To treat relapsed or refractory acute ileukemia
38.	Orlynvah	sulopenem etzadroxil, probenecid	10/25/2024	To treat uncomplicated urinary tract infections (uUTI)
37.	Vyloy	zolbetuximab-clzb	10/18/2024	To treat gastric or gastroesophageal junction adenocarcinoma
36.	Hympavzi	marstacimab-hncq	10/11/2024	To prevent or reduce bleeding episodes related to hemophilia A or B
35.	Itovebi	navolisib	10/10/2024	To treat locally advanced or metastatic breast cancer
34.	Flyrcado	flurpiridaz F 18	9/27/2024	A radioactive diagnostic drug to evaluate for myocardial ischemia and infarction
33.	Cobenfy	xanomeline and trospium chloride	9/26/2024	To treat schizophrenia
32.	Aqneursa	levacetylleucine	9/24/2024	To treat Niemann-Pick disease type C
31.	Miplyffa	arimoclomol	9/20/2024	To treat Niemann-Pick disease type C
30	Ebglyss	lebrikizumab-lbkz	9/13/2024	To treat moderate-to-severeatopic dermatitis
29.	Lazcluze	lazertinib	8/19/2024	To treat non-small cell lung cancer
28.	Niktimvo	axatilimab-csfr	8/14/2024	To treat chronic graft-versus-host disease (cGVHD)
27.	Livdelzi	seladelpar	8/14/2024	To treat primary biliary cholangitis (PBC)
26.	Nemluvio	nemolizumab-ilto	8/12/2024	To treat prurigo nodularis
25.	Yorvipath	palopegteriparatide	8/9/2024	To treat hypoparathyroidism
24.	Voranigo	vorasidenib	8/6/2024	To treat Grade 2 astrocytoma or oligodendroglioma
23.	Leqselvi	deuruxolitinib	7/25/2024	To treat severe alopecia areata
22.	Kisunla	donanemab-azbt	7/2/2024	To treat Alzheimer's disease
21.	Ohtuvayre	ensifentrine	6/26/2024	To treat chronic obstructive pulmonary disease
20.	Piasky	crovalimab-akkz	6/20/2024	To treat paroxysmal nocturnal hemoglobinuria
19.	Sofdra	sofpironium	6/18/2024	To treat primary axillary hyperhidrosis
18.	Iqirvo	elafibranor	6/10/2024	To treat primary biliary cholangitis in combination with ursodeoxycholic acid

No.	Drug Name	Active Ingredient	Approval Date	FDA-approved use on approval date*
17.	Rytelo	imetelstat	6/6/2024	To treat low- to intermediate-1 risk myelodysplastic syndromes
16.	Imdelltra	tarlatamab-dlle	5/16/2024	To treat extensive stage small cell lung cancer
15.	Xolremdi	mavorixafor	4/26/2024	To treat WHIM syndrome (warts, hypogammaglobulinemia, infections and myelokathexis)
14.	Ojemda	tovorafenib	4/23/2024	To treat relapsed or refractory pediatric low-grade glioma
13.	Anktiva	nogapendekin alfa inbakicept-pmln	4/22/2024	To treat bladder cancer
12.	Lumisight	pegulicianine	4/17/2024	To use as an optical imaging agent for the detection of cancerous tissue
11.	Zevtera	ceftobiprole medocaril sodium	4/3/2024	To treat certain bloodstream infections, bacterial skin and associated tissue infections, and community-acquired bacterial pneumonia
10.	Voydeya	danicopan	3/29/2024	To treat extravascular hemolysis with paroxysmal nocturnal hemoglobinuria
09.	Vafseo	vadadustat	3/27/2024	To treat anemia due to chronic kidne disease
08.	Winrevair	sotatercept-csrk	3/26/2024	To treat pulmonary arterial hypertension
07.	Duvyzat	givinostat	3/21/2024	To treat Duchenne muscular dystrophy in individuals aged 6 years and older
06.	Tryvio	aprocitentan	3/19/2024	To treat hypertension
05.	Rezdiffra	resmetirom	3/14/2024	To treat noncirrhotic non-alcoholic steatohepatitis with moderate to advanced liver scarring
04.	Tevimbra	tislelizumab-jsgr	3/13/2024	To treat unresectable or metastatic esophageal squamous cell carcinoma
03.	Letybo	letibotulinumtoxinA-wlbg	2/29/2024	To temporarily improve the appearance of moderate-to-severe glabellar lines
02.	Exblifep	cefepime, enmetazobactam	2/22/2024	To treat complicated urinary tract infections
01.	Zelsuvmi	berdazimer	1/5/2024	To treat molluscum contagiosum

*Ref: https://www.fda.gov/drugs/novel-drug-approvals-fda/novel-drug-approvals-2024

BioneX Tranexamic Acid • 500 mg Capsule

Relvis Tiemonium Methylsulphate Tab. & Inj. • 50 mg Tablet • 5mg/2ml Injection

SYLLABUS FOR BCS PRELIMINARY TEST (Part-3)

আন্তর্জাতিক বিষয়াবলি
(INTERNATIONAL AFFAIRS)

পূর্ণমান ২০

		মান বন্টন
১.	বৈশ্বিক ইতিহাস, আঞ্চলিক ও আন্তর্জাতিক ব্যবস্থা, ভূ- রাজনীতি।	০৪
২.	আন্তর্জাতিক নিরাপত্তা ও আন্তরাষ্ট্রীয় ক্ষমতা সম্পর্ক।	০৪
৩.	বিশ্বের সাম্প্রতিক ও চলমান ঘটনাপ্রবাহ।	০৪
৪.	আন্তর্জাতিক পরিবেশ ইস্যু ও কূটনীতি	০৪
৫.	আন্তর্জাতিক সংগঠনসমূহ এবং বৈশ্বিক অর্থনৈতিক প্রতিষ্ঠানাদি।	০৪

ভূগোল (বাংলাদেশ ও বিশ্ব, পরিবেশ দুর্যোগ ব্যবস্থাপনা)
(GEOGRAPHY, ENVIRONMENT AND DIGESTER MANAGEMENT)

পূর্ণমান ১০

১.	বাংলাদেশ ও অঞ্চলভিত্তিক ভৌগোলিক অবস্থান, সীমানা, পারিবেশিক, আর্থ-সামাজিক ও ভূ-রাজনৈতিক গুরুত্ব।	০২
২.	অঞ্চলভিত্তিক ভৌত পরিবেশ (ভূ-প্রাকৃতিক), সম্পদের বন্টন ও গুরুত্ব।	০২
৩.	বাংলাদেশের পরিবেশ : প্রকৃতি ও সম্পদ, প্রধান চ্যালেঞ্জসমূহ।	
৪.	বাংলাদেশ বৈশ্বিক পরিবেশ পরিবর্তন: আবহাওয়া ও জলবায়ু নিয়ামক-সমূহের সেক্টরভিত্তিক (যেমন অভিবাসন, কৃষি, শিল্প, মৎস ইত্যাদি) স্থানীয় , আঞ্চলিক ও বৈশ্বিক প্রভাব।	০২ ০২
৫.	প্রাকৃতিক দুর্যোগ ও ব্যবস্থাপনা, দুর্যোগের ধরন, প্রকৃতি ও ব্যবস্থাপনা।	০২

সাধারণ জ্ঞান
(GENERAL SCIENCE)

পূর্ণমান ১৫

ভৌত বিজ্ঞান:

পদার্থের অবস্থা, এটমের গঠন, কার্বনের বহুমুখী ব্যবহার, এসিড, ক্ষার, লবণ, পদার্থের ক্ষয়, সাবানের কাজ, ভৌত রাশি এবং এর পরিমাপ, ভৌত বিজ্ঞানের উন্নয়ন, চৌম্বকত্ব, তরঙ্গ এবং শব্দ, তাপ ও তাপগতি বিদ্যা, আলোর প্রকৃতি, স্থির এবং চল তড়িৎ, ইলেকট্রনিক্স, আধুনিক পদার্থবিজ্ঞান, শক্তির উৎস এবং এর প্রয়োগ, নবায়নযোগ্য শক্তির উৎস, পারমাণবিক শক্তি, খনিজ উৎস, শক্তির রূপান্তর, আলোক যন্ত্রপাতি, মৌলিক কণা, ধাতব পদার্থ এবং তাদের যৌগসমূহ, অধাতব পদার্থ, জারণ-বিজারণ, তড়িৎ কোষ, অজৈব যৌগ, জৈব যৌগ, তড়িৎ চৌম্বক, ট্রান্সফরমার, এক্সরে, তেজস্ক্রিয়তা ইত্যাদি। ০৫

জীব বিজ্ঞান:

পদার্থের জীববিজ্ঞান-বিষয়ক ধর্ম, টিস্যু, জেনেটিকস, জীববৈচিত্র্য, এনিম্যাল ডাইভারসিটি, প্লান্ট ডাইভারসিটি, এনিম্যাল টিস্যু, অর্গান এবং অর্গান সিস্টেম, সালোক সংশেষণ, ভাইরাস, ব্যাকটেরিয়া, জুলোজিক্যাল নমেনক্লেচার, বোটানিক্যাল নমেনরেচার, প্রাণিজগৎ, উদ্ভিদ, ফুল, ফল, রক্ত ও রক্ত সঞ্চালন, রক্তচাপ, হৃদপিন্ড এবং হৃদরোগ, স্নায়ু এবং স্নায়ুরোগ, খাদ্য ও পুষ্টি, ভিটামিন, মাইক্রোবায়োলজি, প্লান্ট নিউট্রেশন, পরাগায়ন ইত্যাদি। ০৫

আধুনিক বিজ্ঞান:

পৃথিবী সৃষ্টির ইতিহাস, কসমিক রে, ব্লাক হোল, হিগের কণা, বারিমন্ডল, টাইড, বায়ুমন্ডল, টেকটোনিক প্লেট, সাইক্লোন, সুনামি, বিবর্তন, সামুদ্রিক জীবন, মানবদেহ, রোগের কারণ ও প্রতিকার, সংক্রামক রোগ, রোগ জীবাণুর জীবনধারণ, মা ও শিশু স্বাস্থ্য, ইস্যুনাইজেশন এবং ভ্যাকসিনেশন, এইচআইভি, এইডস্, টিবি, পোলিও, জোয়ার-ভাটা, এপিকালচার, সেরিকালচার, পিসিকালচার, হর্টিকালচারড ডায়োড, ট্রানজিস্টর, আইসি, আপেক্ষিক তত্ত্ব, ফোটন কথা ইত্যাদি। ০৫

কম্পিউটার ও তথ্য প্রযুক্তি
(COMPUTER AND INFORMATION TECHNOLOGY)

পূর্ণমান ১৫

কম্পিউটার: মান বন্টন ১০

১. কম্পিউটার পেরিফেরালস (Computer Peripherals): কি-বোর্ড (Keyboard), মাউস (Mouse), ওসিআর (OCR) ইত্যাদি।
২. কম্পিউটারের অঙ্গসংগঠন (Computer Architecture): সিপিইউ (CPU), হার্ড ডিস্ক (Hard Disk), এএলইউ (ALU) ইত্যাদি।
৩. কম্পিউটারের পারঙ্গমতা (Computer Performance).
৪. দৈনন্দিন জীবনে কম্পিউটার (Computer in Practical Fields). কৃষি, যোগাযোগ, শিক্ষা, স্বাস্থ্য, খেলাধুলা ইত্যাদি।
৫. কম্পিউটারের নম্বর ব্যবস্থা (Number Systems of Computer).
৬. অপারেটিং সিস্টেমস (Operating Systems).
৭. এমবেডেড কম্পিউটার (Embedded Computer).
৮. কম্পিউটারের ইতিহাস (History of Computer).
৯. কম্পিউটারের প্রকারভেদ (Types of Computer).
১০. কম্পিউটার প্রোগ্রাম (Computer Program): ভাইরাস (VIRUS), ফায়ারওয়াল (Firewall) ইত্যাদি।
১১. ডেটাবেইস সিস্টেম (Database System)।

তথ্যপ্রযুক্তি: ০৫

১. ই-কমার্স (E-Commerce).
২. সেলুলার ডাটা নেটওয়ার্ক (Cellular Data Network): ২জি (2G), থ্রিজি(3G), ফোরজি (4G), ওয়াইম্যাক্স (Wimax) ইত্যাদি।
৩. কম্পিউটার নেটওয়ার্ক (Computer Network): ল্যান (LAN), ম্যান (MAN), ওয়াই-ফাই(WiFi), ওয়াইম্যাক্স (Wimax) ইত্যাদি।
৪. দৈনন্দিন জীবনে তথ্যপ্রযুক্তি (Information Technologies in Practical Fields).
৫. স্মার্টফোন (SmartPhone).
৬. ওয়ার্ল্ড ওয়াইড ওয়েব (World Wide Web - WWW).
৭. ইন্টারনেট (Internet).
৮. নিত্য প্রয়োজনীয় কম্পিউটিং প্রযুক্তি Daily-Use Computing Technology): ই-মেইল (E-mail), ফ্যাক্স (Fax) ইত্যাদি।
৯. ক্লায়েন্ট-সার্ভার ম্যানেজমেন্ট (Client-Server Management).
১০. মোবাইল প্রযুক্তির বৈশিষ্ট্যসমূহ (Mobile Features).
১১. তথ্যপ্রযুক্তির বড় প্রতিষ্ঠান ও তাদের সেবা/তথ্যসমূহ (Tech-Giants Services & News): গুগল (Google), মাইক্রোসফট (Microsoft), আইবিএম (IBM) ইত্যাদি।
১২. ক্লাউড কম্পিউটিং (Cloud Computing).
১৩. সোশ্যাল নেটওয়ার্কিং (Social Networking): ফেসবুক (Facebook), টুইটার (Twitter), ইন্সটাগ্রাম (Instagram) ইত্যাদি।
১৪. রোবটিক্স (Robotics);
১৫. সাইবার অপরাধ (Cyber Crime)।

Formet® Metformin Hydrochloride
Formet-V® Metformin Hydrochloride
Formet -L® Metformin Hydrochloride
Formet XR 1 gm Metformin Hydrochloride



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)
	Pediatric Drops	Cefixime 21 ml (25 mg/ml)
Biocap	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)
	PFS	Azithromycin 50 ml (200 mg/5 ml)
Moxif 400® Moxifloxacin HCl Tablet	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
Supracef®	Capsule	Cephradine 250 mg
	Capsule	Cephradine 500 mg
	Pediatric Drops	Cephradine 15 ml (125 mg/1.25 ml)
	PFS	Cephradine 100 ml (125 mg/5 ml)
	Forte PFS	Cephradine 100 ml (250 mg/5 ml)
Winner	IM Injection	Ceftriaxone 500 mg
	IM Injection	Ceftriaxone 1 gm
	IV Injection	Ceftriaxone 500 mg
	IV Injection	Ceftriaxone 1 gm
	IV Injection	Ceftriaxone 2 gm
Zidimax	IV/IM Injection	Ceftazidime 250 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 Insulin-Sensitizer	Tablet	Vildagliptin 50 mg
Formet®	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	Meclizine HCl 50 mg
Avert plus	Tablet	Meclizine 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)
Antiulcerant		
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
Super Antioxidant 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
Cloma	Tablet	Clonazepam 0.5 mg
	Tablet	Clonazepam 1 mg
	Tablet	Clonazepam 2 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	Levosalbutamol 100 ml



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 (Fixed-dose combination)	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		
Asclop	Tablet	Aspirin 75 mg + Clopidogrel 75 mg
Enoma (Pre-filled Syringe)	Injection	Enoxaparin Sodium 40 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
Totpa®	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 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 Antiseptic Hand Rub	10 ml 250 ml	Chlorhexidine 0.5% + Isopropyl Alcohol 75%
BIORUB- I Antiseptic Hand Sanitizer	50 ml 100 ml 250 ml	Isopropyl Alcohol 75%+ Hydrogen Peroxide 0.125%+ 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
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 B_1 100 mg + B_6 200 mg + B_{12} 200 mcg
Orthocal	Tablet	Calcium Carbonate 500 mg
Orthocal-D®	Tablet	Calcium Carbonate 500 mg + Vitamin D_3 200 IU (15's)
	Tablet	Calcium Carbonate 500 mg + Vitamin D_3 200 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)



Brand	Dosage Form	Generic & Strength
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)
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)
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%

BioVISION
Caring Eyes

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)
Ocuflox	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		
Relye	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

NEW PRODUCT 2024

BESTCEF Max
Cefixime 100 mg/ ml

Gastisol Max
Sodium Alginate, Sodium Bicarbonate & Calcium Carbonate

Relvis
Tiemonium Methylsulphate

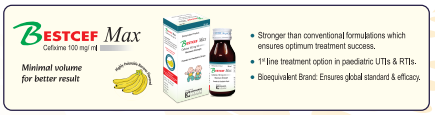
Icand
Itraconazole

Amofun
Amorolfine

Rifexa
Rifaximin

Formet XR 1 gm
Metformin Hydrochloride

Linbid
Linezolid



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With

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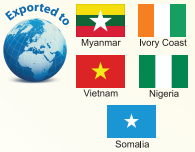
Esomeprazole

Ensures relief from frequent
Acid reflux & Heartburn



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

Mexclav
Cefuroxime & Clavulanic Acid

500 mg Tablet
250 mg Tablet
70 ml PFS

The STAR Cephalosporin with Plus Advantages



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



Word Puzzle

1	4		-						12
2			7	“8	9		10	11	
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		■				■			
3		6				■			
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	“5						”		■
	■			■	■	■	■	■	■

Instruction

Left to right:

1. 1st shaheed in the Anti discrimination movement.
2. Ascorbic Acid - Vitamin Preparation of Biopharma.
5. Cefixime Trihydrate - Antibiotic preparation of Biopharma.

Above to downward:

1. Paracetamol preparation of Biopharma Limited.
3. Dengue Symptom.
4. Rosuvastatin - Cardiovascular Drug of Biopharma.
6. Dengue Symptom.
7. Fexofenadine - Antihistamin preparation of Biopharma.
8. Fluid Treatment of dengue.
9. Omeprazole - Anti Ulcerent of Biopharma.
10. Criteria of severe dengue with warning sign.
11. Azithromycin preparation of Biopharma.
12. Viral Infection from mosquitoes to people.

Please mail the Post Card within March 30 2025



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. 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 NSAIDs preparation of BIOPHARMA.

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

ALHAMDULILLAH

ACHSE

EFVRE

OVMITING

RAHS

PRODUCT NAME:.....

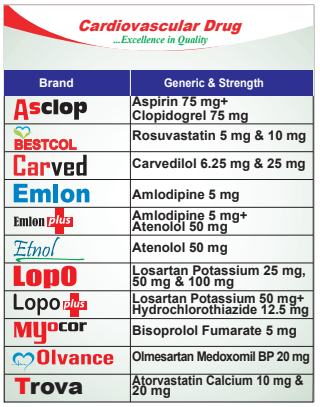
GENERIC NAME : .....

Medi Quiz (21th Edition)

1. Write one WHO criteria for dengue hemorrhagic fever (DHF).
2. Fill in the blank: The time taken for flushing is the capillary refill time and if it is more than __sec, there is gross hypovolumia.
3. Write one criteria for dengue warning sign.

Please read review article about dengue management.





Moxif
Moxifloxacin 0.5%

I-fort
Polyethylene glycol 0.4% &
Propylene glycol 0.3%

Business Reply Card

Name : .....

Institution with Batch : .....

Joining Date of Internship : .....

Interested to post graduation in : .....

Mobile : .....

E-mail : .....

Please send your
(Puzzle & Quiz)
Answer
Through Biopharma People

Medical Services Department
BIOPHARMA LTD.
House No.- 1, Road- No. 1,
Dhaka Housing, Adabar, Dhaka- 1207

Name : .....

Institution with Batch : .....

Mobile : .....

Your valuable suggestions/comments (If any)

INTERN*vision*
A Unique Newsletter only for Intern Doctors
August - December 2024 Vol- 11 Number 21

(Please Don't Cut This Portion)

Medi Quiz

Please write the answer for each question

A: 1: | A: 2:

A: 3:

Word Puzzle

1	4		-						12
2			7	“8	9		10	11	
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3		6				■			
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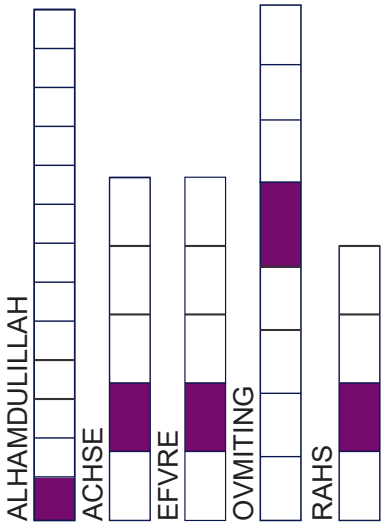
	“5						”		■
	■			■	■	■	■	■	■

Letter Puzzle



PRODUCT NAME: .....

GENERIC NAME : .....

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Products

BIOEQUIVALENT APPROVED PRODUCT

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.

BESTCEF® Cefixime trihydrate equivalent to **Tergecef (Unilab)**

Maczith® Azithromycin equivalent to **Zithromax (Pfizer)**

Inpro® Omeprazole equivalent to **Losec (AstraZeneca)**

Mextil® Cefuroxime equivalent to **Zinacef (GlaxoSmithKline)**

Glucostat MR® Gliclazide Modified Release equivalent to **Diamicron MR (SERVIER)**

Clamycin® Clarithromycin equivalent to **Klaricid (Abbot)**

Vasofex XR® Prazosin extended release tablet equivalent to **Minipress XL (Pfizer)**





BIOPHARMA LIMITED

Committed to Serving Mankind

