Prescription Pattern of Antibiotic among the Specialist Doctors in Different area of Bangladesh

A Research Report submitted to the Department of Pharmacy, East West University in partial fulfillment of the requirement for the Degree of Bachelor of Pharmacy

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April, 2016

Declaration by the research candidate

I, Shikha Akter, ID: 2011-3-70-006, hereby declare that the dissertation entitled "Prescription pattern of Antibiotic among the specialist Doctors in different area of Bangladesh", submitted by me to the Department of Pharmacy, East West University and in the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, under the supervision and guidance of Mohammed Faisal Bin Karim, Senior lecturer, Department of Pharmacy, East West University, Dhaka.

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Certificate by the Supervisor

This is to certify that the thesis entitled "Prescription pattern of Antibiotic among the specialist Doctors in different area of Bangladesh", submitted to the Department of Pharmacy, East West University, Aftabnagar, Dhaka in partial fulfillment of the requirement for the award of the degree of Bachelor of Pharmacy is abonafide record of original research work was carried out by Shikha Akter, ID: 2011-3-70-006 in 2016.

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Certificate by the Chairperson

This is to certify that the dissertation entitled "Prescription pattern of Antibiotic among the specialist Doctors in different area of Bangladesh" is abonafide research work done by Shikha Akter ID No: 2011-3-70-006, under the guidance of Mohammed Faisal Bin Karim, Senior Lecturer, Department of Pharmacy, East West University, Aftabnagar, Dhaka, Bangladesh.

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Dedication

This research paper is dedicated to my beloved parents and honorable faculties.

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Abstract

Antibiotics prescribing by physicians have gained due importance across the globe, mainly because of an increase in antibiotic usage, prevalence of infections and drug resistances. A survey on prescribing pattern of antibiotics was done for a period of up to 10 months in the different area of Bangladesh. This retrospective study was designed to observe the adherence of the prescribing practices of antibiotics among different specialist doctors. The objective of this study was to investigate the prescribing patterns of antibiotics in the outpatient hospital and Prescription were obtained from patients visiting private and public hospital in different area of Bangladesh. Here the evaluation of the prescription pattern was based on the percentages of antibiotics prescribed in different specialist doctors, percentage of prescribed antibiotics which included in EDL.A total of 1600 prescriptions were analyzed during the study period. From 1600 prescription found that the percentage of antibiotic containing 776 and the Percentages from total prescription was 48.5% and Percentage of different specialist among all Antibiotic containing prescription shows that Medicine accommodate the highest area of (45.61%) and then the Dermatology (11.47%), Gynecology (10.44%), Orthopedics (10.31%), ENT (8.25%), Pediatric (6.96%) and Gastro-liver (6.96%) as the number of medicine related prescription is high in this study. There also evaluation of the Percentage distribution of prescription those followed EDL 51.67% and not followed 48.33%.From the study we found that the shares of antibiotic among different pharmaceutical companies in Square pharmaceutical limited 24.87%,in Incepta pharmaceutical limited 19.97%, Beximco pharmaceutical limited 19.32%, in Opsonin pharma Ltd 12.76%, in Renata ltd 9.03%, ACI ltd 4.38%,in Eskayef Bangladesh ltd 3.22%, Healthcare pharma ltd 3.61% ,in Drug international ltd 1.68%, in popular pharmaceutical ltd 0.77% and in Aristopharma ltd 0.5%. From this research, it is observed that physicians prescribed antibiotics rationally in some cases but needs to ensure in all cases of prescription otherwise irrational use leads to the spread of bacterial resistance to antibiotics and related health problems.

Keywords: Antibiotics, Essential drug list (EDL), irrational prescribing, and Antibiotic resistance.

Chapter One

Introduction

Introduction

1.1 Health care system in Bangladesh

The Health care system in Bangladesh falls under the control of the Ministry of Health and Family Planning. The government is responsible for building health facilities in urban and rural areas. For example, in the late 1980's in Bangladesh, the rural health facilities that existed in the rural areas were mostly sub-district health centers, rural dispensaries and family welfare centers. Unfortunately, they were poorly administered(WHO, 2010).

In Bangladesh, the majority of the country's population lives in rural areas, while the majority of health professionals work in urban centers. Also, the rapid growth of the private medical system meant that fewer professionals remained in the public sector to take care of the masses. Private systems are mostly out of reach for poor people who can barely afford to live day by day.

The health system in Bangladesh is supply-side financed, meaning that poor households can have access to medical treatments or at least to essential medical care. Still, there is a large gap because community financing programs are missing.

Some NGO's have started to offer micro-credit medical programs in order to help develop a national insurance program. One third of the national health system is publicly financed, meaning that the government pays for it from taxes and international subsidies. This means that the poor population is forced to pay for medical expenses while they can barely afford to put bread on the table because of the immense lack of jobs (WHO, 2010).

1.2 Prescription pattern in Bangladesh

Prescription writing is a science and art, as it conveys the message from the prescriber to the patient. Prescribing is a complex task requiring diagnostic skills, knowledge of medicines, an understanding of the principles of clinical pharmacology, communication skills, appreciation of risk and uncertainty. Prescribers can only treat patients in a rational way if they have access to an essential drugs list and essential drugs are available on a regular basis. (Begum et al, 2012).

The total number of registered physicians in Bangladesh is 32, 498, thus making one physician for every 4000 people (WHO, 2000). In the absence of enough qualified doctors, drugs are often prescribed by unqualified health workers and people can get any drug from any drug store without a prescription. Each day new drugs with higher cost are coming into market in large scale.

Family individuals have to spend big amounts of money for purchasing drugs. For example, Bangladesh spent 5,500 cores in health only in the year 1996-1997, out of which total spending on drugs was tk 2,700 cores. But it was found that the family/individuals had to spend tk 2500

cores which are about 90.7% of total spending on drugs. Government and other sources spent only tk 250 cores for drugs (Bangladesh national health accounts 1996-1997).

Medically inappropriate and economically inefficient use of medicines is observed throughout the bangladesh.it has a severe shortage of human resources for health and a workforce far below the threshold value of 22.8 per 10,000 population estimated by world health organization (WHO)as necessary for meeting the health related millennium development goals. Given the shortage of qualified health work force in Bangladesh and the inequity of their distribution, People prefer to seek health care from non-qualified providers in the informal sector, especially the poor and the disadvantaged. Lack of facilities, lack of doctors and lack of medications, moreover lack of appropriate knowledge of both doctors and patients are leading health of rural patients in great risk. Inadequate supply of essential drugs, substandard quality, uncontrolled drug prices and inappropriate uses of drugs are major problems in Bangladesh (Bangladesh national health accounts 1996-1997).

1.3 Drug utilization and prescription error

Drug utilization study as defined by the WHO, is a structured process which is used to assess the quality of drug therapy by engaging in the evaluation of data on drug prescribing, dispensing and patient use in a given health care environment, against predetermined, agreed upon criteria and standards, with special emphasis on the resulting medical, social, and economic consequences (Jimoh*et al.*, 2011). Drug utilization studies seek to monitor, evaluate and suggest modifications in the prescribing practices with the aim of making the medical care rational and cost effective (Jimoh*et al*, 2011).

A study of prescription pattern is an important tool to determine rational drug therapy, maximize utilization of resources and to reduce prescription errors. In 2008, the world health organization (WHO) reported that more than half of all medicines are prescribed dispensed or sold (Silva, 2009) inappropriately and that half of all patients fail to take them correctly. Prescription errors are an unfortunate reality at hospitals. Approximately, 30% of problems occurring during hospitalization are related to medication errors (Silva, 2009). Errors are possible at any step of the care process, from medication selection to drug administration.

The majority of errors are not only due to reckless behavior on the part of health care providers, but also occurs as a result of the speed and complexity of the medication use cycle, combined with faulty systems, processes and conditions that lead people to make mistakes or fail to prevent them (Barker *et al.*, 2002; Moyen*et al.*, 2008). Bates *et al.* (1995) reported that 56% of adverse drug events occurred during the prescribing stage and 34% during the administration stage; only 4% occurred at the dispensing stage. National Drug policy (NDP, 2005) states that only registered drugs should be allowed to distribute and sell throughout the country under person having professional qualification and holding professional license.

These audits and studies can also influence the policy makers by informing them about the quality of drug use in the health facility (Desai, 2001; Bimo*et al*., 1999). There is an urgent need to ensure that patients are always given evidence-based, cost-effective and rational treatments. Gaining insight into physician's pattern in order to identify prescribing problem is the fundamental step in improving the quality of prescription and patient care (Sultana et al, 2015).

1.4 Standard prescribing indicators

World health organization (WHO) has designed standardized prescribing indicators to evaluate the trends of prescribing in health facilities. These are the number of drugs per encounter, the percentage of drugs prescribed by brand name, the percentage of antibiotics and injectable drugs per encounter, and the percentage of drugs prescribed from an essential drug list (EDL).

These indicators are used to describe current treatment practices, compare health facilities and prescribers, and allow for identification of potential drug-use problems that may affect patient care.1–3 The WHO recommended value of the number of medicines per prescription ranges from 1.4 to 1.8, antibiotics prescription 20% to 27%, and injectable medicines 13.4% to 24.1%, whereas standard accepted value for prescribing by generic name and from EDL is 100%. Based on these recommended values, drug-prescribing patterns in health institutions can be evaluated. Hence, based on an evaluation, the necessary modification to the pattern to achieve rational and cost-effective medication use may be suggested. A minimum of 600 patient records can be evaluated retrospectively for drug-prescribing pattern study in health facilities (Summoro et al., 2015).

1.5 Rational use of drugs

Definition of rational use of medicines is "Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community" (WHO, 2002).

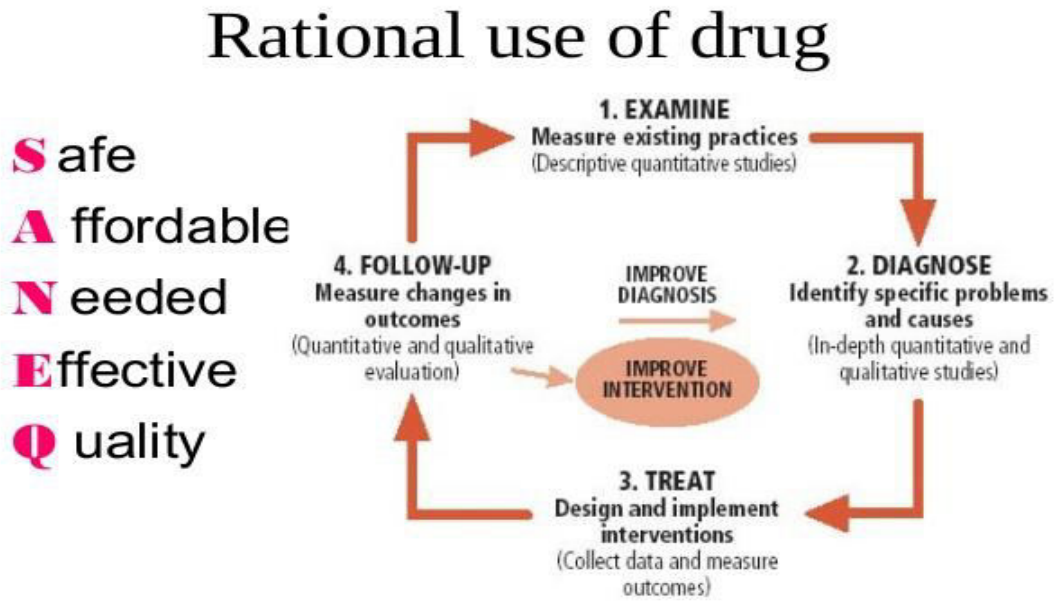

Fig 1.5: Rational use of drug (Juxtaglomerular, 2014)

1.5.1 Twelve core interventions to promote more rational use of medicines
These are:
1) A mandated multi-disciplinary national body to coordinate medicine use policies
2) Clinical guidelines
3) Essential medicines list based on treatments of choice
4) Drugs and therapeutics committees in districts and hospitals
5) Problem-based pharmacotherapy training in undergraduate curricula
6) Continuing in-service medical education as a licensure requirement
7) Supervision, audit and feedback
8) Independent information on medicines

9) Public education about medicines
10) Avoidance of perverse financial incentives
11) Appropriate and enforced regulation
12) Sufficient government expenditure to ensure availability of medicines and staff.

(WHO, 2002).

1.6 Irrational use of drugs

Irrational or non-rational use is the use of medicines in a way that is not compliant with rational use as define above. Worldwide more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, while 50% of patients fail to take them correctly (WHO, 2002).

Irrational use of drugs may lead to:-

1. Ineffective & unsafe treatment
2. Exacerbation or prolongation of illness.
3. Distress & harm to patient
4. Increase the cost of treatment (Raju et al, 2013)

1.6.1 Impact of Irrational use of Drugs

Impact of inappropriate use of drugs can leads some problems. Such as:

1) Reduction in the quality of drug therapy leading to increased morbidity and mortality.

2) Waste of resources leading to reduced availability of other vital drugs and increased costs.

3) Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance

4) Psychosocial impact which may cause an apparent increased demand for unnecessary drugs.

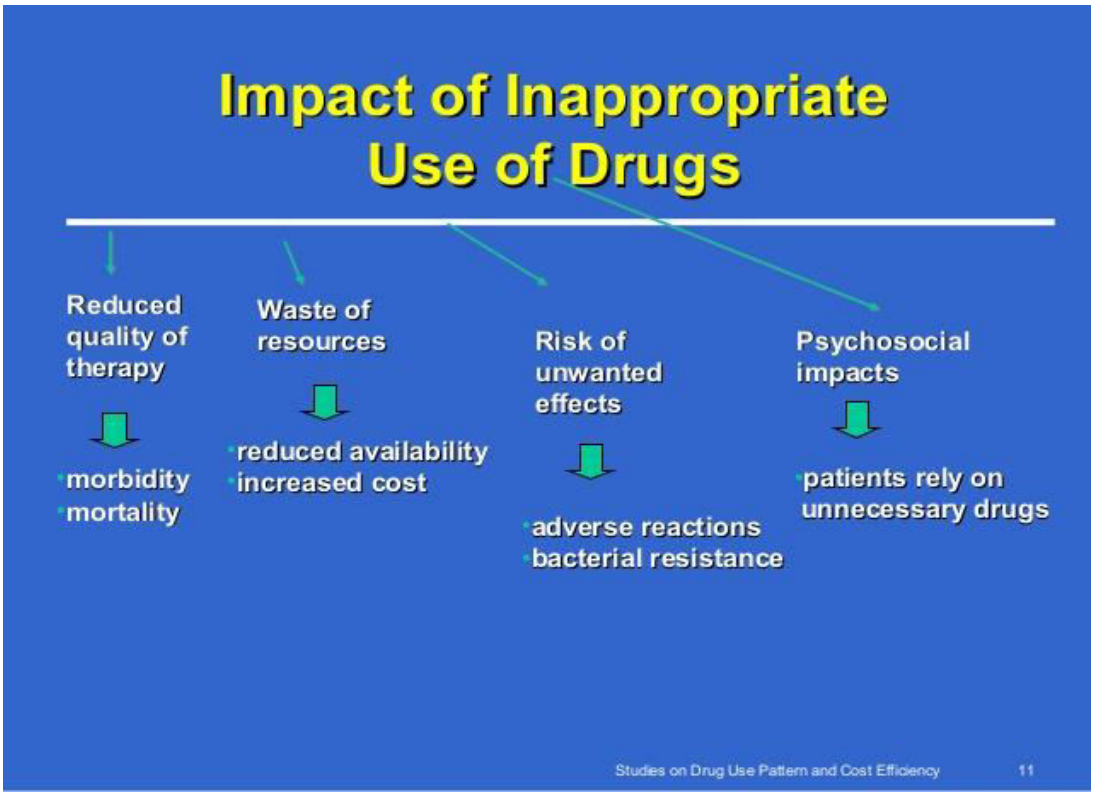

Fig 1.6.1: Impact of inappropriate use of drugs (Alamgir, 2015)

1.6.2 Reasons for irrational use of drug

- **Lack of information:**
  Unlike many developed countries we don't have regular facility which provides us up to date unbiased information on the currently used drugs. Majority of our practitioners rely on medical representatives. There are differences between pharmaceutical concern & the drug regulatory authorities in the interpretation of the data related to indications & safety of drugs.
- **Faulty & inadequate training & education of medical graduates:**
  Lack of proper clinical training regarding writing a prescription during training period, dependency on diagnostic aid, rather than clinical diagnosis, is increasing day by day in doctor.
- **Poor communication between healthprofessional & patient:**
  Medical practitioners & other health professional giving less time to the patient & not explaining some basic information about the use of drugs.

- **Lack of diagnostic facilities/Uncertainty of diagnosis:**
  Correct diagnosis is an important step towardrational drug therapy. Doctors posted in remoteareas have to face a lot of difficulty in reaching toa precise diagnosis due to non-availability ofdiagnostic facilities. This promotes poly-pharmacy.
- **Demand from the patient:**
  To satisfy the patient expectations anddemand of quick relief, clinician prescribe drug forevery single complaint. Also, there is a belief that"every ill has a pill" All these increase the tendencyof poly-pharmacy.
- **Defective drug supply system & ineffective drug regulation:**
  Absence of well-organized drug regulatoryauthority & presence of large number of drugs inthe market leads to irrational use of drugs.
- **Promotional activities of pharmaceutical industries:**
  The lucrative promotional programs of thevarious pharmaceutical industries influence thedrug prescribing *(*Brahma et al, 2012).

1.6.3 Irrational use of drugs in Patients and Community Level

Patients are the ultimate users of drugs. They make the final decision about whether or not to seek health care, where to seek it, and what medicines to actually take and at what intervals or duration. Correct prescribing does not guarantee that drugs will be properly used. Non adherence to prescription is very common (Grand et al 1999).

Decisions by the patient are influenced by many factors, including cultural beliefs, the communication skills and attitudes of health workers, accessibility to and nature health service delivery point, community belief about the efficacy of certain drugs, routes of administration and the patient's assessment of a particular disease.

In some instances, patients' lack the knowledge to make appropriate judgement of their drugs they require and the fear of the illness lead them to the demand for inappropriate treatment. This together with the concept that, there is a pill for every ill has resulted into patients' over reliance on drugs, becoming accustomed to using particular drugs or dosage forms. For example, using injectable in conditions where oral dosage forms would be more appropriate or using of antibiotics in the treatment of the common cold.

The availability of drugs within the community has allowed unlimited access to patient of all classes of drugs. Reports from WHO indicate that prescription drugs are widely available from a variety of sources which include street peddlers, traditional healers and unlicensed stores in most of the developing countries (WHO, 1997).

Prescription-only drugs are also routinely available direct to consumers even from licensed pharmacies due to lack of state regulatory enforcement capacity. Drugs sellers and consumers do not differentiate between the Over the counter (OTC) and the prescription only medicines. Lack of access to health facilities lead to patients to resort to any form of health care available in the

community, including self-medication as a result, irrational drug use is more prevalent in areas that are less covered by public health unit than those that are covered(WHO, 1997).

1.7 Antibiotics

Antibiotics are a group of medicines that are used to treat infections caused by germs (bacteria and certain parasites). A parasite is a type of germ that needs to live on or in another living being (host). Antibiotics are sometimes called antibacterial or antimicrobials. Antibiotics can be taken by mouth as liquids, tablets, or capsules, or they can be given by injection. Usually, people who need to have an antibiotic by injection are in hospital because they have a severe infection. Antibiotics are also available as creams, ointments, or lotions to apply to the skin to treat certain skin infections.

It is important to remember that antibiotics only work against infections that are caused by bacteria and certain parasites. They do not work against infections that are caused by viruses (for example, the common cold or flu), or fungi (for example, thrush in the mouth or vagina), or fungal infections of the skin. Occasionally, a viral infection or minor bacterial infection develops into a more serious secondary bacterial infection (Knott, 2014)

This is why different antibiotics are used to treat different types of infection. The main types of antibiotics include:

- Penicillins - for example, phenoxymethylpenicillin, flucloxacillin and amoxicillin.
- Cephalosporins - for example, cefaclor, cefadroxil and cefalexin.
- Tetracyclines - for example, tetracycline, doxycycline and lymecycline.
- Aminoglycosides - for example, gentamicin and tobramycin.
- Macrolides - for example, erythromycin, azithromycin and clarithromycin.
- Clindamycin.
- Sulfonamides and trimethoprim - for example, co-trimoxazole.
- Metronidazole and tinidazole.
- Quinolones - for example, ciprofloxacin, levofloxacin(Knott, 2014).

1.7 Classification of Antibacterial agents:

Antimicrobials are classified in several ways, including:

1. Spectrum of activity
2. Effect on bacteria
3. Mode of action.

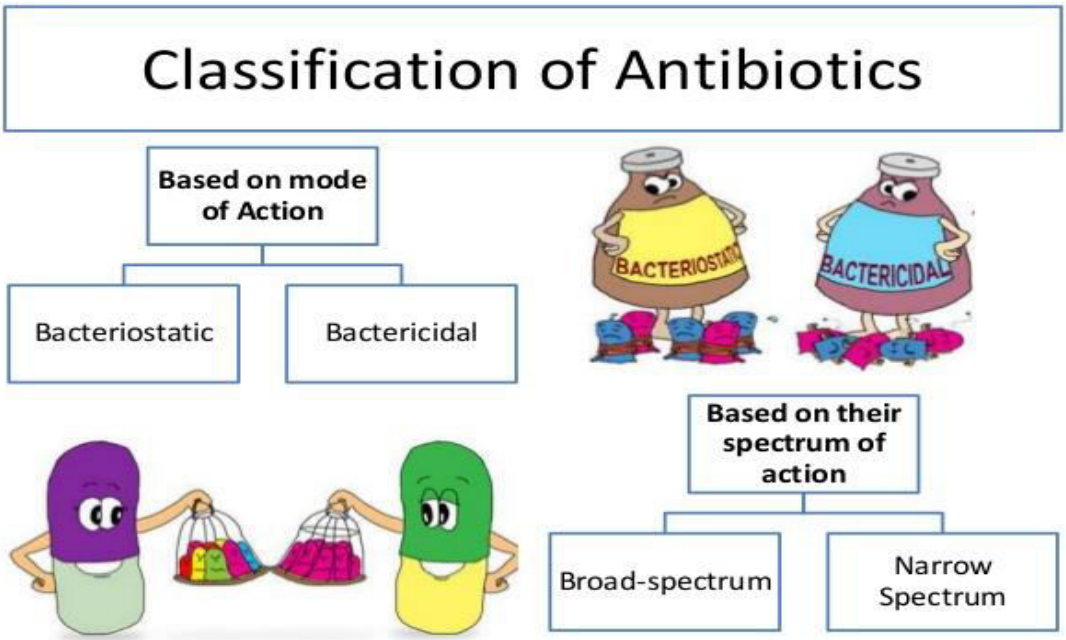

Fig 1.8: Classification of Antibiotics (Keyes et al, 2003).

1.8.1 Classification according to spectrum of activity

Depending on the range of bacterial species susceptible to these agents, antibacterial are classified as broad-spectrum, intermediate-spectrum, or narrow- spectrum.

1. **Broad spectrum antibacterial** are active against both Gram-positive and Gram-negative organisms. Examples include: tetracyclines, phenicols, fluoroquinolones, "third-generation" and "fourth-generation" cephalosporins.
2. **Narrow spectrum antibacterial** have limited activity and are primarily only useful against particular species of microorganisms. For example, glycopeptides and bacitracin are only effective against Gram-positive bacteria, whereas polymixins are usually only effective against Gram negative bacteria. Aminoglycosides and sulfonamides are only effective against aerobic organisms, while nitroimidazoles are generally only effective for anaerobes (Keyes et al, 2003).

1.8.2 Effect on Bacteria

Because of differences in the mechanisms by which antibiotics affect bacteria, the clinical use of antibacterial may have very different effects on bacterial agents, leading to an endpoint of either inactivation or actual death of the bacteria.

1. **Bactericidal drugs** are those that kill target organisms. Examples of bactericidal drugs include aminoglycosides, cephalosporins, penicillins, and quinolones.
2. **Bacteriostatic drugs** inhibit or delay bacterial growth and replication. Examples of such include tetracyclines, sulfonamides, and macrolides.
3. Some antibiotics can be both bacteriostatic and bactericidal, depending on the dose, duration of exposure and the state of the invading bacteria. For example, aminoglycosides, fluoroquinolones, and metronidazole exert concentration-dependent killing characteristics; their rate of killing increases as the drug concentration increases (Keyes et al, 2003).

1.8.3 Specific Mechanism of Action of Antimicrobial Agents:

The most common targets for antimicrobial drug actions fall into 5 basic categories:

- Inhibition of Cell Wall Synthesis
- Inhibition of Protein Synthesis
- Inhibition of Nucleic Acid Synthesis
- Effects on cell membrane function (antifungal agents)
- Inhibition of unique metabolic steps

Mechanism of Action	Drugs
Inhibition of Cell Wall Synthesis Inhibit cross-linking of peptidoglycan by inactivating transpeptidases (PBPs)	Penicillins, Cephalosporins, Aztreonam, Imipenem
Bind to terminal D-ala-D-ala& prevent incorporation into growing peptidoglycan	Vancomycin, Teicoplanin
Inhibition of transglycosylation	Oritavancin,,Teicoplanin,lipophilic, Vancomycin analogs, ramiplanin

Inhibit dephosphorylation of phospholipid carrier in peptidoglycan structure	Bacitracin
Prevents incorporation of D-alanine into peptidoglycan	Cycloserine
Inhibition of Protein Synthesis Bind to 50S ribosomal subunit	Macrolides, Chloramphenicol, Clindamycin
Bind to 30S ribosomal subunit	Aminoglycosides, Tetracyclines
Inhibition of Nucleic acid synthesis Inhibition of DNA gyrase& topoisomerase	Quinolones
Inhibition of nucleic acid biosynthesis	Flucytosine, Griseofulvin
Inhibition of mRNA synthesis	Rifampin, Rifabutin, Rifapentine
Alteration of Cell Membrane Function Inhibition of ergosterol biosynthesis	Imidazole antifungals
Bind to membrane sterols	Polymyxins, Amphotericin B, Nystatin
Alteration of Cell Metabolism Inhibition of tetrahydrofolic acid production (cofactor for nucleotide synthesis)	Sulfonamides, Trimethoprim, Trimetrexate Pyrimethamine
Inhibition of mycolic acid biosynthesis	Isoniazid
Interference with ubiquinone biosynthesis & cell respiration	Atovaquone
Bind to macromolecules	Metronidazole, Nitrofurantoin

(Murray, 1994)

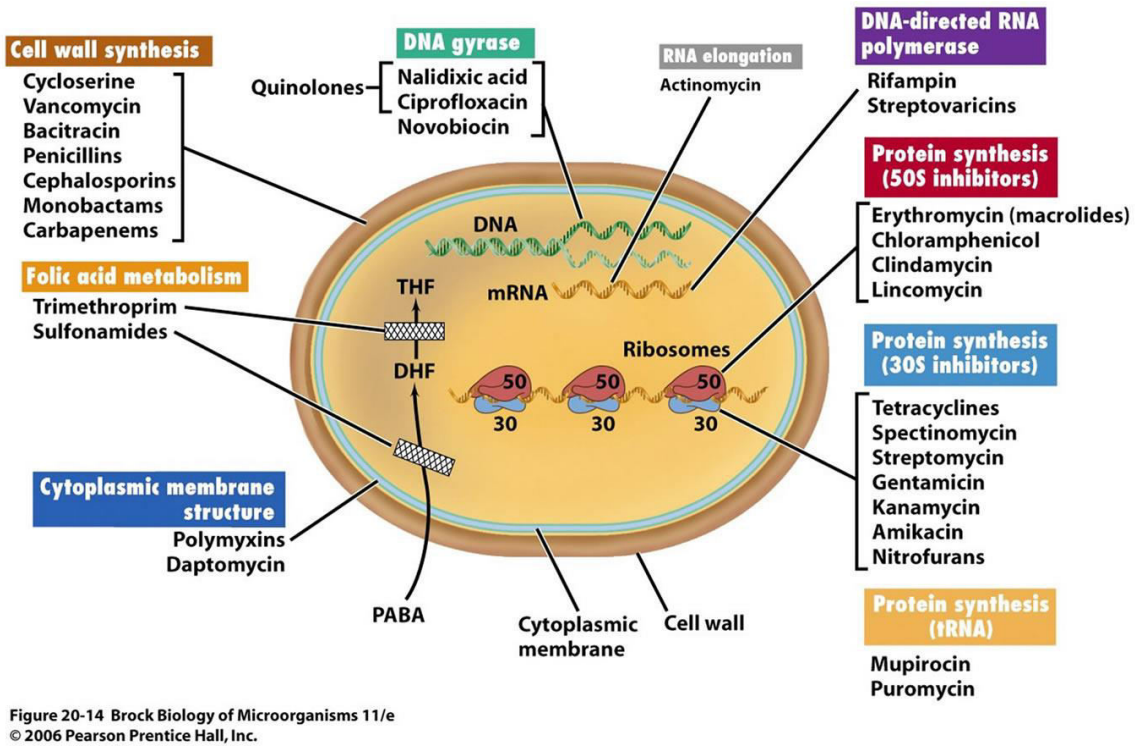

Fig 1.8.3: Mechanism of action of Antibiotic (Bbosa et al, 2014)

1.9. Adverse Effects of Antibiotics

Antibiotics can literally save lives and are effective in treating illnesses caused by bacterial infections. However, like all drugs, they have the potential to cause unwanted side effects. Many of these side effects are not dangerous, although they can make life miserable while the drug is being taken. In general, antibiotics rarely cause serious side effects.

The most common side effects from antibiotics are

1) Diarrhea,
2) Nausea,
3) Vomiting,
4) Hypersensitivity (Allergic) reaction such as rash.
5) Fungal infections of the mouth,
6) Fungal infection in digestive tract and
7) Fungal infection in vagina

This can also occur with antibiotics because they destroy the protective 'good' bacteria in the body (which help prevent overgrowth of any one organism), as well as the 'bad' ones, responsible for the infection being treated.
Some people are allergic to antibiotics, particularly penicillin's. Allergic reactions cause swelling of the face, itching and a skin rash and, in severe cases, breathing difficulties. Allergic reactions require prompt treatment (Bayarski, 2007)

1.10 Indications of Antibiotics in different illness:

Increasing antimicrobial resistance is now a worldwide problem, compounded by the lack of development of new antimicrobial medicines. This leaves the prudent use of antimicrobial medicines, along with infection control, as the major strategies to counter this emerging threat.

A safe and effective strategy for antibiotic use involves prescribing an antibiotic only when it is needed and selecting an appropriate and effective medicine at the recommended dose, with the narrowest spectrum of antimicrobial activity, fewest adverse effects and lowest cost.

General principles of antibiotic prescribing:

1) Only prescribe antibiotics for bacterial infections if:
   - ✓ Symptoms are significant or severe
   - ✓ there is a high risk of complications
   - ✓ The infection is not resolving or is unlikely to resolve.
2) Use first-line antibiotics first
3) Reserve broad spectrum antibiotics for indicated conditions only (Antibiotics guide, 2013).

1.10.1 Necessities of Antibiotics in different illness

Diseases	First choice	Alternatives
Acute exacerbation of COPD	Amoxicillin	Doxycycline
Pertussis (Whooping cough)	Azithromycin, Erythromycin	None
Pneumonia	Amoxicillin	roxithromycin or doxycycline

Otitis externa (acute)	Clioquinol + flumethasone (LocortenVioform) Dexamethasone + framycetin + gramicidin (Sofradex)	Ciprofloxacin + hydrocortisone (Ciproxin HC) Flucloxacillin
Otitis media	Amoxicillin	Co-trimoxazole
Pharyngitis	Phenoxymethylpenicillin (Penicillin V), Amoxicillin	Erythromycin
Sinusitis (acute)	Amoxicillin	Doxycycline
Conjunctivitis	Chloramphenicol 0.5% eye drops	Fusidic acid eye gel
Bacterial meningitis and suspected meningococcal sepsis	Benzylpenicillin (penicillin G)	Ceftriaxone
Impetigo	Topical (localised patches): Fusidic acid 2% cream, Flucloxacillin	Erythromycin
Giardiasis	Ornidazole, Metronidazole	Nitazoxanide (hospital treatment)
Bacterial vaginosis	Metronidazole	Ornidazole
Chlamydia	Azithromycin	Amoxicillin
Gonorrhoea	Ceftriaxone	Ciprofloxacin
Pelvic inflammatory disease	Ceftriaxone, Metronidazole	Ceftriaxone + azithromycin
Acute pyelonephritis	Co-trimoxazole	Amoxicillin clavulanate
Trichomoniasis	Metronidazole	Ornidazole
Urinary tract infection (UTI) – adult	Trimethoprim, Nitrofurantoin	Norfloxacin

(Antibiotics guide, 2013)

1.11 Antibiotic resistance

Antibiotics are extremely important in medicine, but unfortunately bacteria are capable of developing resistance to them. Antibiotic-resistant bacteria are germs that are not killed by commonly used antibiotics. When bacteria are exposed to the same antibiotics over and over, the bacteria can change and are no longer affected by the drug.

Bacteria have number of ways how they become antibiotic-resistant. For example, they possess an internal mechanism of changing their structure so the antibiotic no longer works, they develop ways to inactivate or neutralize the antibiotic. Also bacteria can transfer the genes coding for antibiotic resistance between them, making it possible for bacteria never exposed to an antibiotic to acquire resistance from those which have. The problem of antibiotic resistance is worsened when antibiotics are used to treat disorders in which they have no efficacy (e.g. antibiotics are not effective against infections caused by viruses), and when they are used widely as prophylaxis rather than treatment.

Resistance to antibiotics poses a serious and growing problem, because some infectious diseases are becoming more difficult to treat. Resistant bacteria do not respond to the antibiotics and continue to cause infection. Some of these resistant bacteria can be treated with more powerful medicines, but there some infections that are difficult to cure even with new or experimental drugs (Bayarski, 2007).

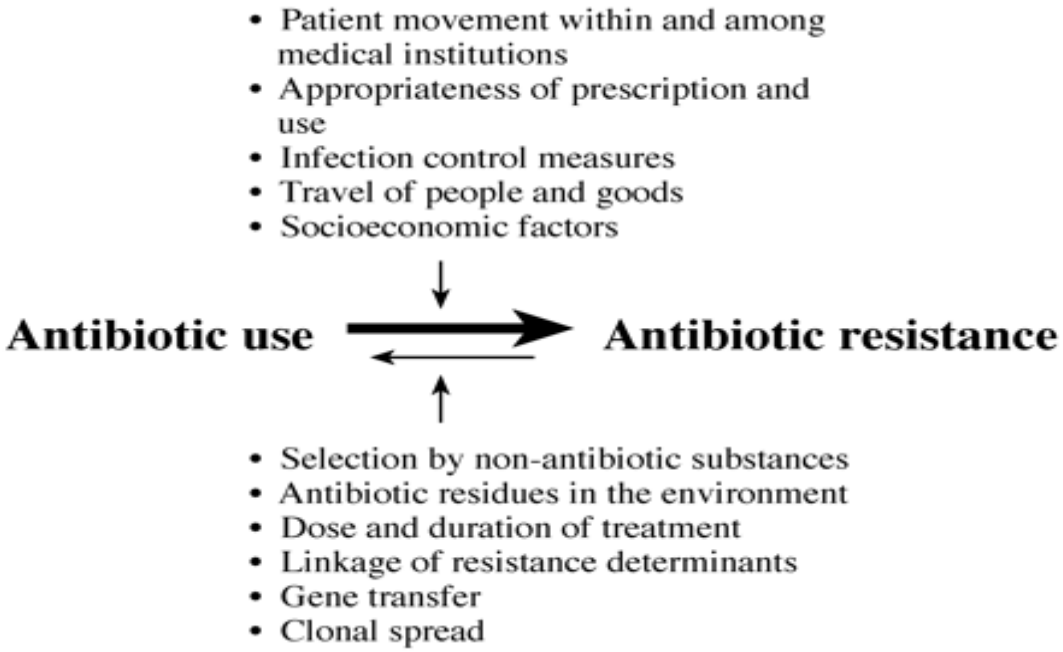

Fig 1.11: Factor influence the Antibiotic resistance (Levy, 2002).

In the figure 1.11:While the major factor driving the emergence of drug resistance is antibiotic use, a number of other factors influence the antibiotic resistance problem, including the spread and fate of bacteria, resistance genes and antibiotics, as well as the behavioral and medical activities of people. Each contributes to producing the problem and to the difficulty in reversing it (Levy, 2002).

1.11.1 Scope of the problem

Antibiotic resistance is rising to dangerously high levels in all parts of the world. New resistance mechanisms emerge and spread globally every day, threatening our ability to treat common infectious diseases. A growing list of infections—such as pneumonia, tuberculosis, blood poisoning and gonorrhea—are becoming harder, and sometimes impossible, to treat as antibiotics become less effective.

In countries where antibiotics can be bought without a prescription, emergence and spread of resistance is made worse. Similarly, in countries without standard treatment guidelines, antibiotics are often over-prescribed by health workers and over-used by the public. Without urgent action, we are heading for a post-antibiotic era, in which common infections and minor injuries can once again kill (WHO, 2015).

1.11.2 Prevention and control

Antibiotic resistance is accelerated by the misuse and overuse of antibiotics, as well as poor infection prevention and control. Steps can be taken at all levels of society to reduce the impact and limit the spread of resistance.

The general public can help by:

- Preventing infections by regularly washing hands, practicing good food hygiene, avoiding close contact with sick people and keeping vaccinations up to date
- Only using antibiotics when prescribed by a certified health professional
- Always taking the full prescription
- Never using left-over antibiotics
- Never sharing antibiotics with others (WHO, 2015).

Health workers and pharmacists can help by:

- Preventing infections by ensuring hands, instruments and environment are clean
- Keeping patients' vaccinations up to date
- When a bacterial infection is suspected, perform bacterial cultures and testing to confirm
- Only prescribing and dispensing antibiotics when they are truly needed
- Prescribing and dispensing the right antibiotic at the right dose for the right duration (WHO, 2015).

Policymakers can help by:

- Having a robust national action plan to tackle antibiotic resistance
- Improving surveillance of antibiotic-resistant infections
- Strengthening infection prevention and control measures.
- Regulating and promoting the appropriate use of quality medicines
- Making information on the impact of antibiotic resistance available
- Rewarding the development of new treatment options, vaccines and diagnostics (WHO, 2015).

The agricultural sector can help by:

- Ensure that antibiotics given to animals - including food-producing and companion animals - are only used to treat infectious diseases and under veterinary supervision.
- Vaccinate animals to reduce the need for antibiotics and develop alternatives to the use of antibiotics in plants.
- Promote and apply good practices at all steps of production and processing of foods from animal and plant sources.
- Adopt sustainable systems with improved hygiene, biosecurity and stress-free handling of animals.
- Implement international standards for the responsible use of antibiotics, set out by OIE, FAO and WHO (WHO, 2015).

The healthcare industry can help by:

- Investing in new antibiotics, vaccines, and diagnostics (WHO, 2015).

1.12 Irrational uses of antibiotics

Irrational use of medicines is a global problem. It has been estimated that less than half of all medicines are prescribed, dispensed or sold inappropriately and that less than half of all patients take their medicines as prescribed or dispensed. Irrational use of medicines can harm patients in terms of poor patient outcome, unnecessary adverse reactions and wastage of resources, often out of pocket payments by patients.

Irrational use of antibiotics is particularly serious because it is contributing to antimicrobial resistance that is increasing rapidly worldwide and is causing significant morbidity and mortality and millions of dollars' worth of extra health-care costs annually (Holloway, 2011).

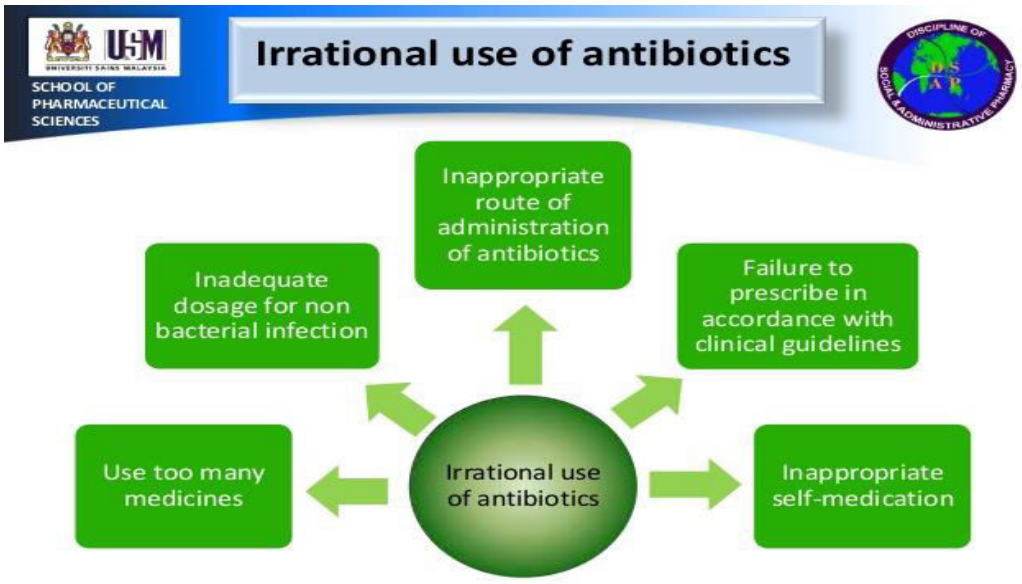

Fig 1.12: Irrational use of Antibiotics (Azmi, 2013)

1.13 Rational use of antibiotic

Although medicines are one of our most cost effective health-care interventions and antibiotics are one of our most effective therapeutic classes of medicine, few low-and middle- income countries are monitoring how they are used. Data on medicines use is conspicuously absent in many health management information systems. By contrast, developed rich regions, such as Europe, are now monitoring antibiotic use and taking action to combat irrational antibiotic use.

In order to monitor the progress in developing countries, WHO headquarters developed a database of quantitative information on medicines use in primary care in developing countries that has been systematically extracted from studies published between 1990 and 2000. Studies numbering 679 from 97 countries were identified of which 151 studies came from the SEA Region.

Data show that in low-and middle-income countries less than 40% patients in the public sector and less than 30% in the private sector are treated in compliance with clinical guidelines, and that the situation has not improved significantly over the last 20 years. With regard to use of antibiotics in the Region, it was found that:

- ✓ 50% of viral upper respiratory tract infection cases are treated unnecessarily with antibiotics, yet only 53% of pneumonia cases receive an appropriate antibiotic;

- ✓ 54% of acute diarrhea cases are treated unnecessarily with antibiotics, yet only 55% receive oral rehydration solution as recommended in the guidelines; and

- ✓ 40% of prescribed antibiotics are prescribed in under-dose.

It was further found that the average patient-dispenser interaction time was less than 1 minute, that only about 40% patients were given dosage instructions, very few drugs were adequately labelled, and that only about 60% patients knew how to take their medicines immediately on leaving the facility. There is now ample evidence of rampant irrational use of antibiotics together with under-implementation of effective interventions and policies to promote rational use of antibiotics.

This is contributing to antimicrobial resistance and it is now urgent that countries and the international community take action. There are a number of possible reasons for this.

- ✓ Firstly, promoting rational use of medicines and containing antimicrobial resistance are not institutionalized within the health care systems of many countries. If there is no department to ensuring appropriate use, who will do the necessary monitoring of antibiotic use and coordination of policy and actors. By contrast the industrial rich nations have invested in national monitoring of antibiotic use and nationwide campaigns to promote rational use of antibiotics.

- ✓ Secondly, a great deal of extra investment will be needed to restructure the health care systems to undertake the necessary activities.

- ✓ Thirdly, health systems have become increasingly fragmented among other reasons, due to increased virtualization and donor demands.

- ✓ Fourthly, there is a huge imbalance of information, with the pharmaceutical industry spending huge amounts of money to promote their products to prescribers and dispensers while governments spend virtually nothing on continuing medical education.

- ✓ Fifthly, while quite a lot is known about how to improve the use of medicines in a targeted way in the public sector, not much is known about how to promote rational use at a national level, incorporating the private and informal sectors, particularly in countries lacking in resources to fund huge government bureaucracies (Holloway, 2011).

1.14 Consequences of irrational use of Antibiotics:

A high level of antibiotic resistance has major consequences for society, and especially for those on the margins who have the least access to health care. Delaying treatment with the right antibiotic increases the chance of severity and complications and forces the use of more potent and costlier antibiotics. Simple infections may need to be treated with antibiotics that need

hospitalization and that increases the pressure on the overburdened hospital system. Most importantly, however, more and more people may die since microbes may have developed the means to destroy the very antibiotics that were meant to kill them.

It is therefore important to look at what could be promoting the rise of antibiotic resistance. One of the possible causes of this phenomenon is the inappropriate use of antibiotics. Community studies have indicated that for illnesses such as diarrhea and fever, which are predominantly viral in etiology, approximately 70 percent of patients going to health facilities are given antibiotics. This is an inappropriate use of antibiotics (since antibiotics have little effect on viruses) and has resulted in increased resistance (Chandy, 2008).

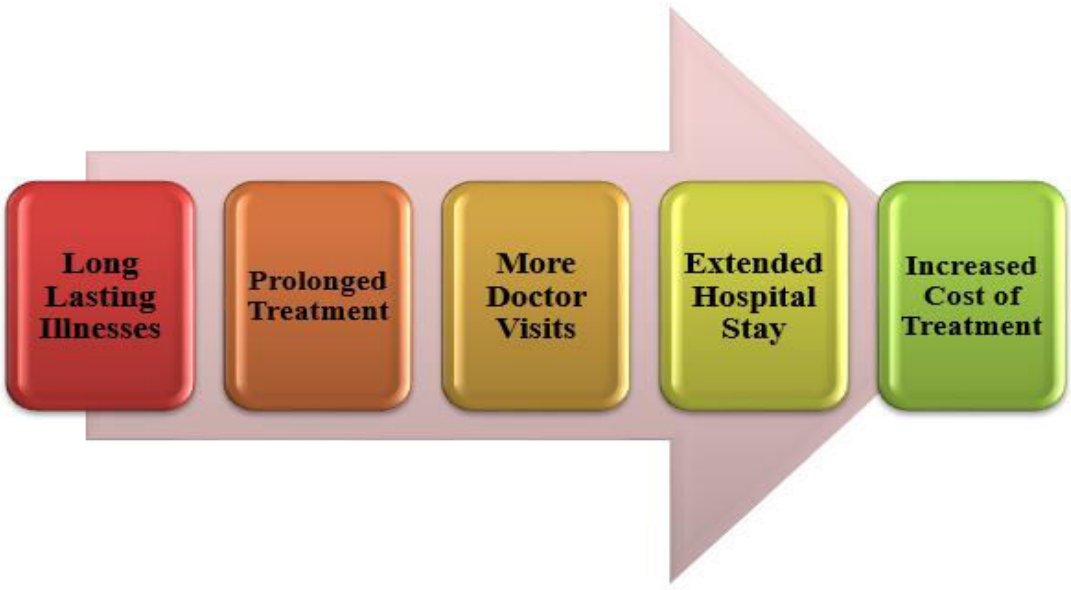

Fig 1.14: Consequence of Antibiotic resistance (sharma, 2015)

1.15 National policies to improve use of antibiotics

National policies greatly influence how medicines are used. Without a favorable policy framework, it will be very difficult to achieve and maintain improved antibiotic use. The Second International Conference on Improving the Use of Medicines noted that irrational use of medicines continued, that there was a relative lack of implementation of interventions, almost all of which were small scale, and that the Problem was multifactorial in nature, involving many stakeholders.

Therefore, they recommended that countries implement national programs to monitor medicines use and to coordinate implementation of interventions, targeting multiple levels of the health care system in both public and private sectors, to improve use. They also recommended that successful small-scale interventions be scaled up and that more interventions be implemented

targeting the community, particularly with regard to informal and private sectors and private pharmacy shops, all of which are particularly relevant in the SEA Region.
It can be seen that many countries are not implementing many basic policies that WHO recommends to encourage appropriate use of medicines. Although it may appear that the number of countries implementing policies has increased between 2003 and 2007, caution must be used when interpreting the figures, particularly for the SEA Region, since the sample sizes are very small and different countries responded in different years. The situation is probably worse than it appears here since many countries are not implementing fully the policies that are supposedly in place. Globally many countries are using an updated Essential Medicines List for public sector procurement, but few have updated national clinical guidelines or have a drug and therapeutic committee in most health facilities to undertake monitoring and education of staff.

Furthermore, it should be noted that most of these policies are aimed at the public and not the private sector, which provides the major chunk of health care in the Region. It is of particular concern that in all countries antibiotics are available over the counter and no regular monitoring of drug use is being undertaken (Holloway, 2011).

1.16 Some issues related to irrational use antibiotic

1.16.1 The role of the public

It is ironical that in this age of information, many people in this country are unable to educate themselves about health matters. They are ill-informed about illnesses, about the fact that a common cold, for example, is caused by a virus and thus does not need to be treated with antibiotics. Children are frequently down with acute respiratory infections and many parents immediately think that their suffering child needs an antibiotic because they do not know that a majority of coughs and colds are viral in origin.

Their ignorance is not just about the cause of the disease; it is also about the medicines that they consume. They may have heard of the term "antibiotic", but often do not know that it is prescribed for an illness caused by bacteria; and they also do not know that it is meant to be taken for a fixed period of time. One may argue that only health professionals need to be educated about disease and medicines, but for health to be in truly preventive mode, a basic knowledge of diseases and drugs among patients would go a long way in ensuring appropriate treatment such as appropriate antibiotic use (Chandy, 2008).

1.16.2 The responsibility of doctors

Doctors are often considered to be God and therefore when a doctor gives an antibiotic to a patient, it is taken without question. However, a doctor is often pressurized to give antibiotics for

a variety of reasons. It could be due to the pressure of making a patient well as soon as possible, or the fear of losing patients to another doctor.

Patients often demand powerful treatments, and then there is the industry pressure and incentive schemes, and, most importantly, the doctor`s own clinical judgment skills. To be fair, many doctors work with inadequate and unreliable investigational facilities. This may promote the use of combination antibiotics and defensive medicine (Chandy, 2008).

1.16.3 Pharmacists and chemists shops

Chemists` shops, more popularly known as "medical shops", are a dime a dozen in many towns and cities. Many of them are situated near doctors` clinics, but often, patients go directly to a chemist, narrate their symptoms and ask for medication. The pharmacist gives his "diagnosis", and most often prescribes antibiotics -- without a doctor`s prescription, of course. The problem is further compounded by the fact that many shops are manned not by qualified pharmacists, but by people who may not have even passed secondary school. Business rather than science is their occupation and whatever a patient asks for is given (Chandy, 2008).

1.16.4 The pharmaceutical industry

Industry and medical representatives "push" irrational antibiotic use more than any other player. After all, money makes the world go round. It is common knowledge that health professionals get incentives for prescribing and dispensing particular brands of medicines. This is particularly true in the case of antibiotics, which are sold most widely in a country like India that has multiple infectious diseases. The situation gets worse when more expensive and reserve antibiotics are promoted by medical representatives who pull out words and sentences from medical literature to convince the already beleaguered doctor that his patient deserves "the best".

The other side of the story is that the pharmaceutical industry is concentrating its research and development on drugs to treat chronic illnesses rather than on antibiotics because of the latter`s fixed duration use and resistance issues. Targeting chronic illnesses is a strategic move for better profitability, but neglecting research and development of antibiotics will have disastrous consequences as more and more of the older antibiotics die without newer ones coming into the market (Chandy, 2008).

1.16.5 The government

There are hardly any government regulations on antibiotic use in India. Policies meant for implementation in hospitals are not strictly implemented.

Neither are there sufficient penalties for irrationally prescribing an antibiotic. The Drug Controller`s office is understaffed and overworked with clinical trial approvals, quality assessments and documentation. Manpower for regulating misuse and overuse of drugs is thus

minimal. Willpower, too, is negligible; it would be interesting to know how knowledgeable policy makers are about the consequences of inappropriate antibiotic use (Chandy, 2008).

1.16.6 Other players

There are other players who may be contributing to a significant amount of inappropriate antibiotic use. Farmers overuse antibiotics for both animal and agricultural purposes. Though there are specific antibiotics for these uses, in practice, many antibiotics used for humans are used in animal husbandry and agriculture. This leads to cross-resistance for humans and consequently high resistance.

Complementary medicine specialists and quacks also use allopathic drugs, including antibiotics, although they have no expertise in their prescription.

Though the law clearly states that properly trained professionals should use only the systems of medicine they are trained in, the reality is very different.

Antibiotic disposal is another issue which merits attention. What happens to antibiotics which expire or antibiotics that are not used? Are there policies in place for disposal of antibiotics and drugs? It`s my guess that many of these antibiotics find their way into our wells and water systems, leading to further exposure and further resistance (Chandy,2008).

1.17 Essential drugs and medicines

Essential drugs (EDs) are the foundation for nearly every public health program. EDs aimed at reducing morbidity and mortality in Bangladesh as well as in the developing world. Essential drugs are those that satisfy the priority health care needs of the people. Essential drugs are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost-effectiveness (WHO, 2012).

According to WHO (2012) essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality, and at a price the individual and the community can afford (WHO, 2012).

Careful selection of a limited range of essential medicines results in a higher quality of care for patients, better management and use of medicines and more cost-effective use of health resources. Clinical guidelines and lists of essential medicines may improve the availability and proper use of medicines within health care systems (WHO, 2012).Most countries have national lists and some have provincial or state lists as well.
National lists of essential medicines usually relate closely to national guidelines for clinical health care practice which are used for the training and supervision of health workers (WHO, 2012). List of essential drugs of Bangladesh about antibiotics is given below:

1.17.1 Table: Essential drug list of Antibiotic

Serial no	Name of Drug
1	Amoxicillin
2	Ampicillin
3	Benzathinebenzylpenicillin
4	Benzyl penicillin
5	Tetracycline
6	Ciprofloxacin
7	Procainbenzylpenicillin
8	Streptomycin
9	Cloxacillin
10	Doxycycline
11	Erythromycin
12	Gentamycin
13	Gentamycin + Hydrocortisone
14	Metronidazole
15	Neomycin Sulfate + Bacitracin
16	Nitrofurantoin
17	Paromomycin
18	Phenoxymethyl penicillin
19	Clotrimazole

(Bangladesh gazette, 2008)

Aims of the study

The aims of this study were:

- ✓ To observe the prescribing pattern of Antibiotics among the specialist doctor in different area of Bangladesh.
- ✓ This study was also done to observe the adherence with the EDL,
- ✓ To observe the mostly prescribed generic and brands of antibiotics in our country.

Significant of the study

- Inadequate supply of essential drugs, substandard quality, uncontrolled drug prices and inappropriate uses of drugs are major problems in Bangladesh .There was a need for vast quantity of essential, useful and economic drugs in Bangladesh. This problem can be minimized by prescribing drugs by generic name and selection of drugs from essential medicine list. Generic drugs are substitute of branded drug without any patent protections with similar efficacy but 40 to 60% cheaper than branded drugs.

- This research will bring out the list of Antibiotic drugs which are commonly prescribed by the doctors .if the outcome do not show the significant adherence with the EDL then the EDL list need to be updated,

- This research will bring out the list of Antibiotic by generics and brands which are commonly prescribed by the doctors .if this mostly covered by few generics and few companies ,then this outcome indicates the significant aggressive marketing and irrational use of drug.

Chapter Two

Literature review

Literature Review

There are substantial amount of research on the prescription pattern of antibiotics in various countries. Different studies showed different results.

2.1 Drug utilization study in orthopedics units: Antibiotics prescribed in hospital out-patients in Dhaka, Bangladesh.

A prospective cross-sectional, multicenter drug utilization study was conducted for a period of 3 months to evaluate the pattern of antibiotics use in orthopedics unit of various hospitals of Dhaka City, Bangladesh. The goal of this study was to see the antibiotics utilization pattern. and they were studied with the total of 498 prescriptions; in which 160 prescriptions contained mono-antibiotic therapy (51.79%) and 147 prescriptions contained poly-antibiotics therapy (48.21%) and the beta-lactam antibiotics were most commonly prescribed (81.68%).They also find out that the Mono-antibiotics prescriptions were the common pattern than combination and brand name has been prescribed frequently than generic (Bithi et al,2014).

2.2 Survey of Antibiotics utilization at sheikh zayed hospital.

A cross sectional study was analyzed the patient's drug charts in medical and surgical wards at Sheikh Zayed Hospital, Rahim Yar khan. They record of 800 patients, was analyzed. Antibiotics were given to 650 patients (81.2%) with the mean age of 38.17 years. Route of administration was intravenous (84.4%), oral (2.3%) and both (13.2%). Patient receiving single antibiotics were 38.1%, while 61.8% received multiple antibiotics. Average number of antibiotics prescribed per patient was 1.8. The range of antibiotics used included 14 active ingredients with 21 different brands. Most commonly prescribed drugs were Ceftriaxone (65.3%), Metronidazole (49.3%) and Quinolones (31.6%).After the survey they find out that there is a high proportion of patients receiving multiple antibiotics in in-patient department of Sheikh Zayed Hospital, Rahim Yar Khan, and hence local guidelines should be established for use of antibiotics (Karim et al,2010).

2.3 Antibiotic prescribing for sore throat: a cross-sectional analysis of the recent study exploring the habits of early-career doctors in family practice.

A cross-sectional study was analyzes to establish the prevalence and associations of antibiotic prescribing for acute sore throat by Australian vocational trainees in family practice. For the study they collected all data from the Registrar Clinical Encounters in Training (Recent) study. This ongoing, multicenter prospective cohort study documents the nature of trainees' consultation-based clinical experiences. The analyses were conducted on data recorded in consultations for sore throat in nine collection periods during 2010-14.

The data from 856 individual trainees (response rate 95.2%) were analyzed. Sore throat was managed in 2.3% encounters. Antibiotics were prescribed for 71.5% of sore throat diagnoses. The variables associated with prescribing were inner-regional location and higher socio-economic area. After the study they find out that there was no significant association with younger age of patient or greater trainee experience.The high frequency of antibiotic prescribing and the lack of attenuation in prescribing with increased experience suggest current educational interventions and the apprenticeship model of training is not fostering appropriate practice in this important clinical area (Dallas et al, 2016).

2.4 A survey of antibiotic outpatient prescribing and antibiotic self-medication.

A survey was carried out of patients from Government and private hospitals (500 each) and of 1000 apparently healthy adults in Benin City, Nigeria in order to assess patterns of antibiotic prescribing and self-medication. Ampicillin and tetracycline were the antibiotics commonly used for self-medication; the commonest reasons given for the self-medication were the treatment of sexually transmitted diseases, cough, stomach upsets and diarrhea. Ampicillin was the commonest prescribed antibiotic; the commonest indications for prescription were soft-tissue, sexually transmitted, upper respiratory and gastro-intestinal infections. According to an assessment by four clinicians from a panel of eight in Government and private practice, 52% of the total prescriptions were judged to be appropriate whereas 30% were judged to be inappropriate by a majority of the physicians (Obaseiki et al, 1987)

2.5 Prescription antibiotics for outpatients in Bangladesh: a cross-sectional health survey conducted in three cities.

A cross sectional health survey was carried out with a self-designed standard questionnaire by manual data collection over a three months period (20.03.2013 to 20.06.2013) at three adjacent cities Jessore Sadar, Monirampur and Keshabpur upazila respectively. The total of 900 prescriptions were analyzed during the study period. It was found that the prescriber prescribed antibiotics to the patients who were suffering mainly from cold and fever, infections, diarrhea and gonorrhea. The highest prescribed antibiotic groups were cephalosporins (31.78%), macrolides (27.33%), quinolones (16.33%), penicillins (7.11%), and metronidazoles (6.78%) respectively. Two or more antibiotics were prescribed in 25.44% of prescriptions. A total of 66.89% prescriptions had complete information on dosage form, 57% had complete direction for antibiotics use and 64.22% patients completed full course of antibiotics. Although 83% prescriptions have no clinical test for using antibiotics, even though the percentages of patients' disease recovery were 61.78% and incompliance were 38.22%. After the survey they observed that physicians prescribed antibiotics rationally in some cases but needs to ensure in all cases of prescription (Biswas et al, 2014).

2.6 Prescribing patterns of antibiotics and sensitivity patterns of common microorganisms in the Internal Medicine ward of a teaching hospital in Western Nepal: a prospective study.

A study was carried out to collect relevant demographic information, antibiotic prescribing patterns and the common organisms isolated including their antibiotic sensitivity patterns. This study was carried out over a 3-month period at the Manipal Teaching Hospital, Western Nepal. The use of antibiotics was classified for prophylaxis, bacteriologically proven infection or non-bacteriologically proven infection. Sensitivity patterns of the common organisms were determined. During the study 203 patients were prescribed antibiotics; 112 were male. Median duration of hospitalization was 5 days. 347 antibiotics were prescribed.The most common were ampicillin, amoxicillin, metronidazole, and ciprofloxacin and benzyl penicillin. Mean ± SD cost of antibiotics was 16.5 ± 13.4 US$. Culture and sensitivity testing was carried out in 141 patients. The common organisms isolated were *H. influenzae, E. coli, K. pneumoniae* and *S. aureus* (Shankar et al, 2003).

2.7 Epidemiology of urinary tract infections and antibiotics sensitivity among pregnant women at Khartoum North Hospital.

A cross sectional study has been conducted at Khartoum north teaching hospital Antenatal Care Clinic between February-June 2010, to investigate epidemiology of UTI and antibiotics resistance among pregnant women. Out of 235 pregnant women included, 66 (28.0%) were symptomatic and 169 (71.9%) asymptomatic. the prevalence of bacteriuria among symptomatic and asymptomatic pregnant women were (12.1%), and (14.7%) respectively, with no significant difference between the two groups ($P = 0.596$), and the overall prevalence of UTI was (14.0%). In multivariate analyses, age, gestational age, parity, and history of UTI in index pregnancy were not associated with bacteriuria. *Escherichia coli* (42.4%) and *S. aureus* (39.3%) were the commonest isolated bacteria. Four, 2, 2, 3, 4, 2 and 0 out of 14 *E. coli* isolates, showed resistance to amoxicillin, naladixic acid, nitrofurantoin, ciprofloxacin, co-trimoxazole, amoxicillin/clavulanate and norfloxacin, respectively. After the study they find out that *Escherichia coli* were the most prevalent causative organisms and showing multi drug resistance pattern, asymptomatic bacteriuria is more prevalent than symptomatic among pregnant women (Hamdan et al, 2011).

2.8 Prior antimicrobial therapy in the hospital and other predisposing factors influencing the usage of antibiotics in a pediatric critical care unit.

A study was carried out at a university-affiliated teaching hospital (760 beds) in Athens to determine whether prior antimicrobial therapy is an important risk factor for extended

antimicrobial therapy among critically ill children and to evaluate other predisposing factors influencing the usage of antibiotics in a pediatric intensive care unit (PICU) setting.

All administered antibiotics to the PICU patients were recorded during a six-month period. During a six-month period 174 patients were admitted to the PICU and received antibiotics for a total of 950 days (62.3% of the length of stay days). While in PICU, 34 patients did not receive antimicrobial treatment (19.5%), 69 received one antibiotic (39.7%), 42 two (24.1%), 17 three (9.8%), and 12 more than three (6.9%). The number of antibiotics prescribed in PICU or at discharge did not differ from that at admission. Indications for receiving antibiotics the day before admission and throughout during hospitalization into PICU were significantly correlated. Although the cumulative number of administered antibiotics did not correlate with mortality (9.8%), it was significantly related to the severity scoring systems PRISM ($p < .001$), TISS ($p < .002$) and was significantly related to the number of isolated microorganisms ($p < .0001$). Multiple regression analysis demonstrated that independent determinants of the cumulative number of antibiotics were: prior administration of antibiotics, presence of a bloodstream infection, positive bronchial cultures, immunodeficiency, and severity of illness. After the study they observed that Prior antimicrobial therapy should be recognized as an important risk factor for extended antimicrobial therapy among critically ill children. Severity of illness, immunodeficiency, and prolonged length of stay are additional risk factors (Briassoulis et al, 2004).

2.9 Effects of intervention measures on irrational antibiotics/ antibacterial drug use in developing countries.

A systematic review was conducted to determine the effect of different interventions (education, managerial, di-agnostic tests, regulatory, economic and multi-faceted) on misuse of AB drugs in developing countries. A total of 722 articles were retrieved and 55 were reviewed. About 10.9% of the studies were from Africa, 63.6% from Asia, 9.1% from Latin America, and 16.4% from Southeastern Europe. A total of 52.7% of the studies were from hospital settings, 5.5% from outpatient departments, 21.8% were from public health care facilities, 12.7% from private pharmacies/drug stores, and 7.3% from the communities. Education intervention had 27.3% studies, managerial had 20%, managerial/education had 3.6%, regulatory had 9.1%, education/regulation had 9.1% and diagnostic had 3.6% studies. Multifaceted intervention had 27.3% studies, with 63% improvement in appropriate AB doses prescribed, 2.6% mean number of AB encounter reduction, 23% AB prescription reduction, 18.3% generic AB prescription improvement, 32.1% reduction in AB use, 89% reduction in AB use in acute respiratory infection, 82% in surgery, 62.7% mean education in deliveries, 39% in STDs, 36.3% mean reduction in diarrhea, 14.6% mean reduction AB use in malaria, and 6% - 11% in the cost of treating bacteria-resistant organisms. Also noted was 6.3% reductions in mean AB en-counters after 1 month of intervention, and then increased to 7.7% after 3 months thus lacking sustainability. They observed that the Multifaceted interventions were effective in reducing irrational AB drug use in the various health facilities and communities as well as reduction in the

emergence of resistance to the commonest bacteria in the developing countries though there was lack of sustainability or continuity of rational drug use over the time (Bbosa *et al*, 2014).

2.10 Survey of antibiotic use of individuals visiting public healthcare facilities in Indonesia.

A study was carried out to estimate the antibiotic use of individuals visiting public healthcare facilities in Indonesia and to identify determinants of use against a background of high resistance rates. Patients on admission to hospital (group A), visiting a primary health center (group B), and healthy relatives (group C) were included in the study. Out Of 2996 individuals interviewed, 486 (16%) had taken an antibiotic. Compared to group C (7% consumption), groups B and A exhibited a three-fold and four-fold higher use of antibiotics, respectively. Respiratory (80%) and gastrointestinal (13%) symptoms were most frequent. Amino-penicillin's and tetracycline's accounted for 80% of the prescribed antibiotics. Similar antibiotics were self-medicated (17% of users). Age less than 18 years and health insurance were independent determinants of antibiotic use. Urban provenance, being adult, male, and having no health insurance were independent determinants of self-medication. In addition to health complaints, other factors determined antibiotic consumption. In view of the likely viral origin of respiratory complaints and the resistance of intestinal pathogens, most antibiotic use was probably unnecessary or ineffective (Hadi et al, 2008).

Chapter Three

Methodology

3.1 Selection of the area

Selecting proper area for survey is a crucial part for getting perfect data, which represent the actual condition. Our capital city Dhaka is the living place of 22 million people. As the most ancient city like other facilities, the health facilities of Dhaka are better than other cities of Bangladesh. People from all part of our country come here for the treatment of their diseases. There are many govt. hospitals and hundreds of private clinics in Dhaka city. So majorities of prescription are collected from Dhaka city and I also collect prescription from the out site in Dhaka.

In this survey the prescription are collected from the following hospital:

- Al-Raji hospital, Banashree,Dhaka
- Farazi hospital ,Banashree,Dhaka
- Kurmitola General Hospital, Cantonment, Dhaka
- Bangabandhu Sheikh Mujib Medical University (BSMMU)
- Dhaka Shishu Hospital
- Uttara Crescent Hospital
- Popular Diagnostic Centre Ltd.
- IbnSina D. Lab. & Consultation Center, Badda
- Community Based Medical College, Mymensingh
- Upazila Health Complex,Lalmohan, Bhola.
- Chittagong medical college hospital
- Kushtia medical college hospital

3.2 Duration of survey

Duration of survey was 10 months commencing from June 2015 to April 2016. To complete the survey in time, a work schedule was prepared depending on different tasks of the study. One month was spent for selection of topic, development of the protocol. Subsequent months were spent on official correspondence, data collection, data analysis, report writing and submission of report.

3.3 Sampling design

A sampling design is a definite plan for obtaining a sample from a given area randomly. It refers to the technique of the procedure the researchers would adopt in selecting items for the sample.
In this survey the prescription are collected from both outdoor and indoor patient in the hospital. The patients who are visiting general practitioner and specialist doctors also counted. During the period of sampling certain information are extract from the prescriptions to be collected. The information was related to the prescribing of the drugs for specific disorder from which specific disease are recognized.

3.4 Inclusion Criteria

In my study both pediatric and geriatric patients are included and the prescription that bears significant impact on

Patient age: 1 day to old aged

Patient sex: Both male and female

Doctors: having specialization on any discipline

Area: Dhaka, Comilla Chittagong, Mymensingh, Kushtia, Bhola etc.

Specifically on the number of medicines like antibiotics prescribing frequency have been included.

3.5 Study Population

From June 2015 through April 2016, total of 1600 prescriptions are collected from government and non-government hospitals specifically from specialist doctors of both male and female patients.

3.6 Data processing and graphical representation

Finally all the collected raw data are processed and represented were analyzed using Statistical Package for Social Sciences (SPSS) for Windows (Version 16; Chicago, IL) and Office excel (Version 2007).

3.7 Materials

In any kind of thesis work certain kinds of materials are required to express the whole thing. Here certain software has helped me to achieve my goal. Drug data and specialist on specific diseases data were computed using MS-Excel, SPSS and DIMS software. The results were expressed as proportions or as percentages.

3.8 Ethics

This study was done in a manner without conflicting the ethical issues. Ethical consideration was checked by the research supervisor with the research policy of the East West University. We do not disturb or harm anybody during the data collection and valued them accordingly.

Chapter Four

Results and Discussion

Result and discussion

A survey study was designed to see the antibiotics prescription pattern among the specialist doctors **i**n different area of Bangladesh. The most prospective general and specialized governmental and private hospitals were covered. A total of 1600 prescription were randomly collected and the numbers of prescription contained antibiotics in different specialist are shown in table:

4.1 Percentage of the prescription containing Antibiotic

Table 4.1.1: The table of the percentage of Antibiotic containing Prescription

Name of the drug	Total no of prescription	Antibiotic containing Prescription	Percentage of antibiotics containing prescription (%)
Antibiotic	**1600**	**776**	**48.5%**

On this survey, 776 prescription out of 1600 contain Antibiotics and the percentage ofantibiotics containingprescriptionis 48.5%.

4.2 Prescription distribution in different specialist

Table 4.2.1: The table of the Prescription distribution in different specialist

Different section of prescription	Prescription number	Total prescription
Medicine	916	
Pediatrics	157	
Orthopedics	127	
Gastro liver	139	1600
Gynecology	97	
ENT	70	
Dermatology	94	

In above table first column represents the name of the different specialist of doctors and second column represents prescription number of the different specialist doctors. Table shows that among the total 1600 prescription, the number of the different section of prescription are in Medicine 916, Pediatrics 157, Orthopedics 127, Gastro liver 139, Gynecology 97, ENT 70 and Dermatology 94.

4.3 Percentage of different specialist among all Antibiotic containing prescription

Table 4.3.1:The table of the Percentage of different specialist among all Antibiotic containing prescription

Name of Different specialist	No of the antibiotic Containing prescription (n=776)	Percentages of prescribed antibiotics (%)
Medicine	354	45.61%
Orthopedic	80	10.31%
Gynecology	81	10.44%
Pediatric	54	6.96%
Dermatology	89	11.47%
ENT	64	8.25%
Gastro-liver	54	6.96%

Where n = no. of the antibiotics containing prescription. In above table represents the name of the Different specialist and their frequency of antibiotics uses in percentages. The above percentage of antibiotic containing prescription in each specialty shows that Medicine accommodate the highest area of 45.61% and then the Dermatology , Gynecology, Orthopedics, ENT , Pediatric and Gastro-liver as the number of medicine related prescription is high in this study.

The chart of only Antibiotic containing prescription

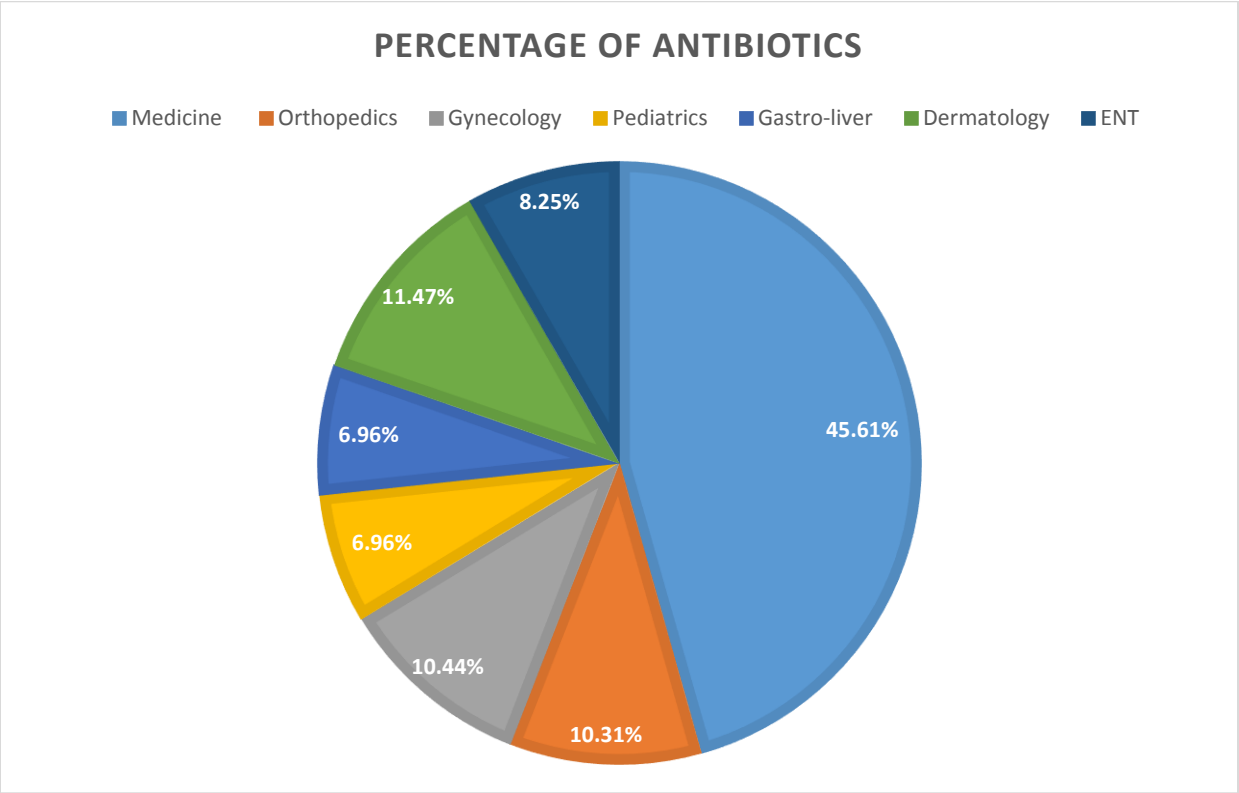

Fig 4.3.2: Percentage of different specialist among all Antibiotic containing prescription

Figure shows that the percentage of prescribed antibiotic in Medicine is 45.61%, in Orthopedics the percentages of the prescribed antibiotics is 10.31%, in Gynecology the percentages of the prescribed antibiotics is 10.44%, in Pediatric the percentages of the prescribed antibiotics is 6.96%, in Dermatology the percentages of the prescribed antibiotics is 11.47%, in ENT the percentages of the prescribed antibiotics is 8.25% and in Gastro-liver the percentages of the prescribed antibiotics is 6.96%. On this study the highest area recognizes medicine specialist.

4.4: Percentage distribution of prescription those followed EDL

Antibiotics that included in EDL are Amoxicillin, Ampicillin, Benzathine benzyl-penicillin, Benzyl penicillin ,Ciprofloxacin, Clotrimazole, Cloxacillin, Doxycycline, Erythromycin, Gentamycin, Metronidazole, Paromomycin, Phenoxymethylpenicillin, Procaine benzylpenicllin, Streptomycin, Tetracycline**,** Nitofurantoin, Gentamycin- hydrocortisone. The percentage of antibiotics that followed and not followed EDL are listed below:

Table 4.4.1: The table of the percentage distribution of prescription those followed EDL

Status	Number of prescription Containing antibiotic (n=776)	Percentage (%)
Followed	401	51.67%
Not followed	375	48.33%

In this study, Among the 776 number of prescription containing antibiotics only 51.67% specialty followed EDL drug list and 48.33% does not follow EDL.

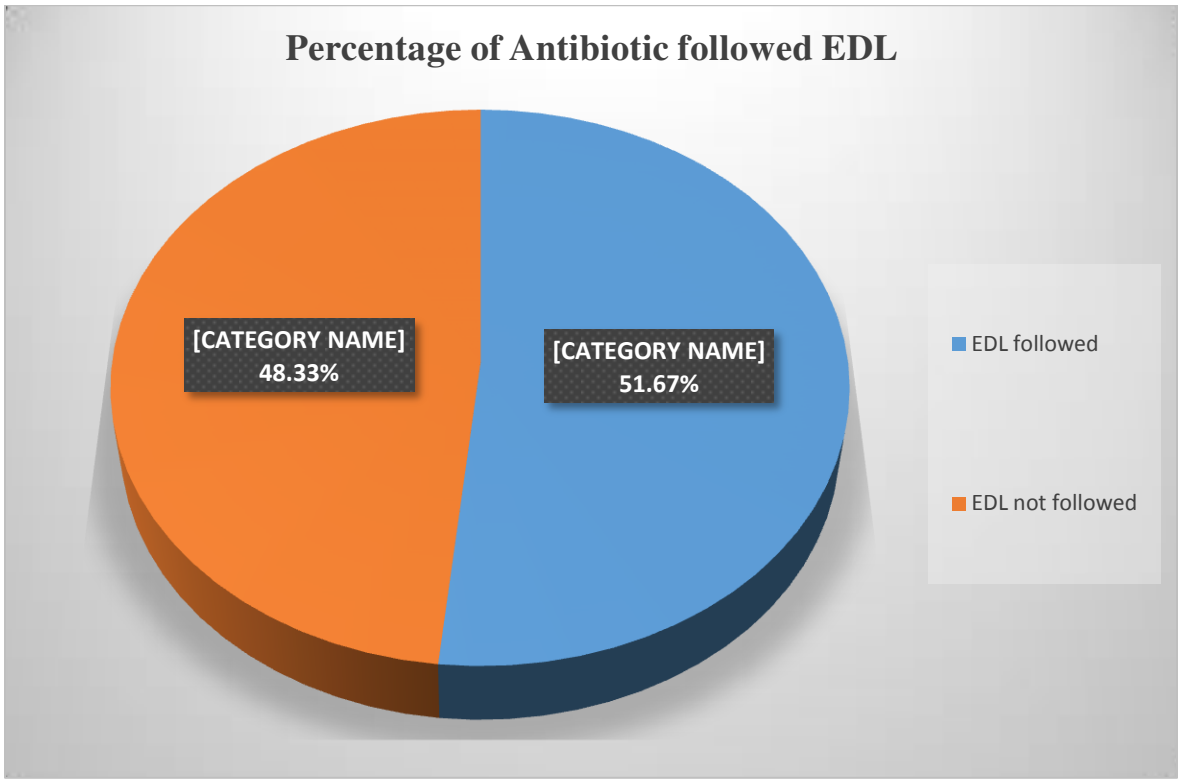

Figure 4.4.2: Percentage (%) distribution of prescription those followed EDL

Figure shows that among the 776 number of prescription containing antibiotics only 51.67% specialty followed EDL (essential drug list) and 48.33% does not follow EDL. This results in irrationality of the antibiotics in modern medical science.

4.5: Percentage of Antibiotics prescribed among their own specialty:

Table 4.5.1: The table of the percentage of Antibiotics prescribed among their own specialty:

Specialist name	Number of prescription	Percentage (%)
Medicine	354 (out of 916)	38.65%
Orthopedics	80(out of 127)	62.99%
gynecology	81(out of 97)	83.50%
Dermatology	89(out of 94)	94.68%
Gastro-liver	54(out of 139)	38.85%
pediatric	54(out of 157)	34.39%
ENT	64 (out of 70)	91.43%

In above table first column represents the name of the different specialist of doctors and second column represents the number of prescription containing antibiotics. Table shows that the Percentage of Antibiotics prescribed among their own specialty. From this table shows that Dermatology and ENT specialist doctor's prescribed highest amount of Antibiotics.

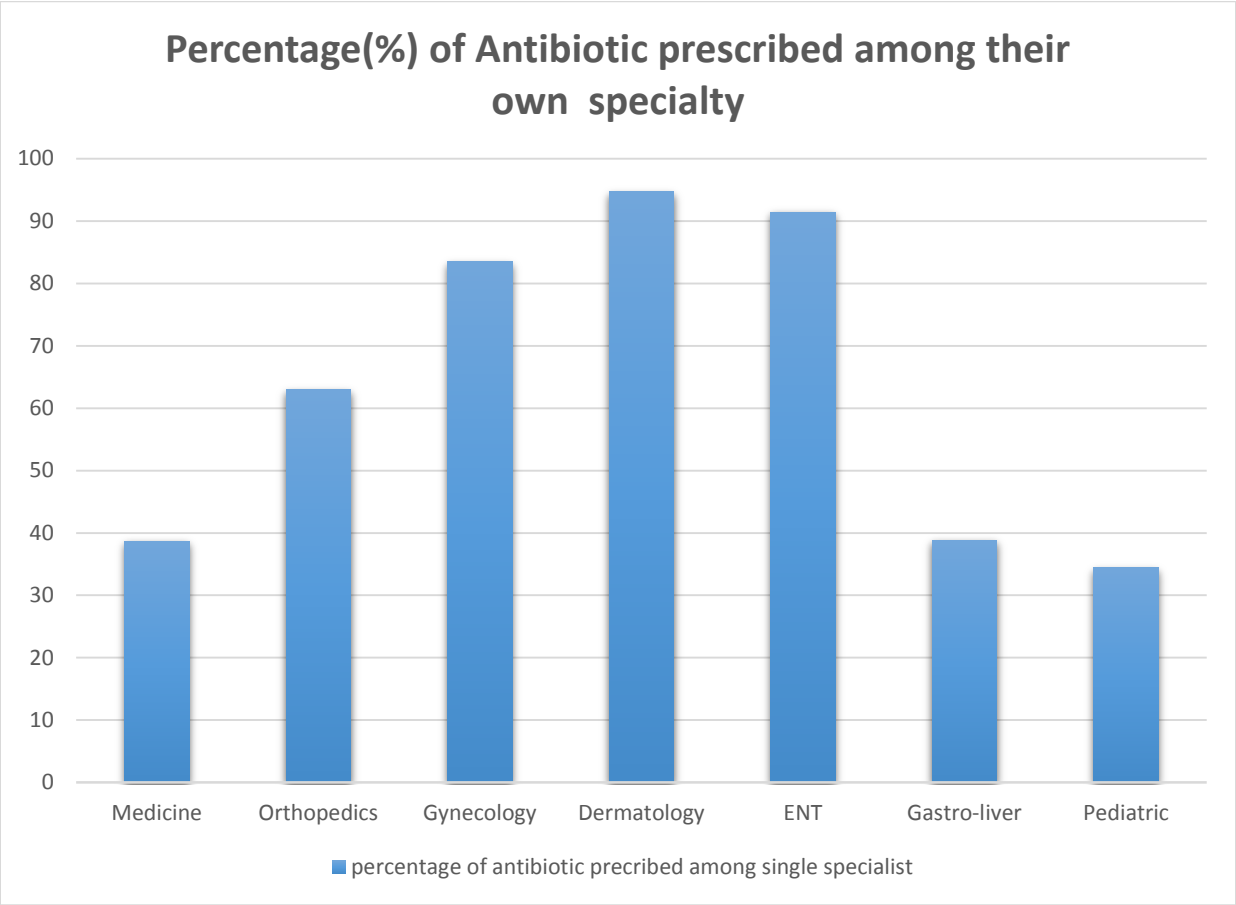

Figure 4.5.2: Percentage (%) of Antibiotics prescribed among their own specialty.

From the above representation we have found that among the total 1600 prescriptions. The percentage(%) of the prescribed antibiotics among the single specialist such as in Medicine 38.65% prescribed antibiotics ,in Orthopedics 62.99%, in Gynecology 83.50%,in Dermatology 94.68%, in ENT 91.43%, in Gastro-liver 38.85% and Pediatrics 34.39% antibiotics are prescribed.

4.6: Percentage (%) of different generic of Antibiotic

Table 4.6.1: The table of the Percentage (%) of different generic of Antibiotic.

Generic name Of Antibiotic	Percentage (%)
Ciprofloxacin	19%
Cefuroxime	20%
metronidazole	17%
Azithromycin	7%
Cefixime	24%
Erythromycin	7%
Amoxicillin	5%
Others	1%

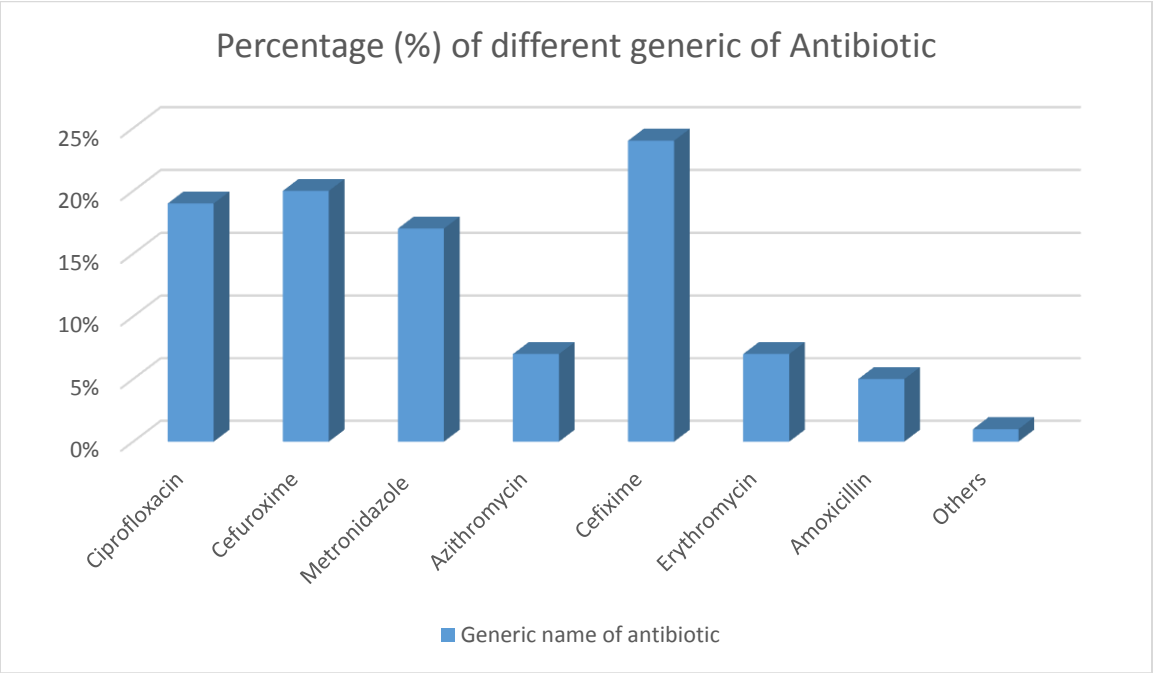

Figure 4.6.2: Percentage of different generic of Antibiotics.

The above percentage of the generic Antibiotics show that the cefixime is the highest area of 24%, then prescribed commonly cefuroxime 20%, then ciprofloxacin 19% and metronidazole prescribed 17%, azithromycin and erythromycin prescribed commonly 7% and then amoxicillin prescribed 5% and others generic of antibiotics 1%.

4.7: Share of antibiotics among the different pharmaceutical company

Table 4.7.1: The table represent that the shares of antibiotic among different pharmaceutical companies among the prescription I have collected is given below:

Pharmaceutical company	No of prescription (n= 776)	Percentage (%)
Square pharmaceuticals Ltd.	193	24.87
Incepta pharmaceuticals Ltd.	155	19.97
Beximco pharmaceuticals Ltd.	150	19.32
Opsoninpharma Ltd.	99	12.76
Renata Limited	70	9.03
ACI Ltd.	34	4.38
Eskayef Bangladesh Ltd.	25	3.22
Healthcare pharmaceuticals Ltd.	28	3.61
Drug international Ltd.	13	1.68

Popular pharmaceuticals Ltd.	5	0.65
Aristopharma Limited	4	0.51

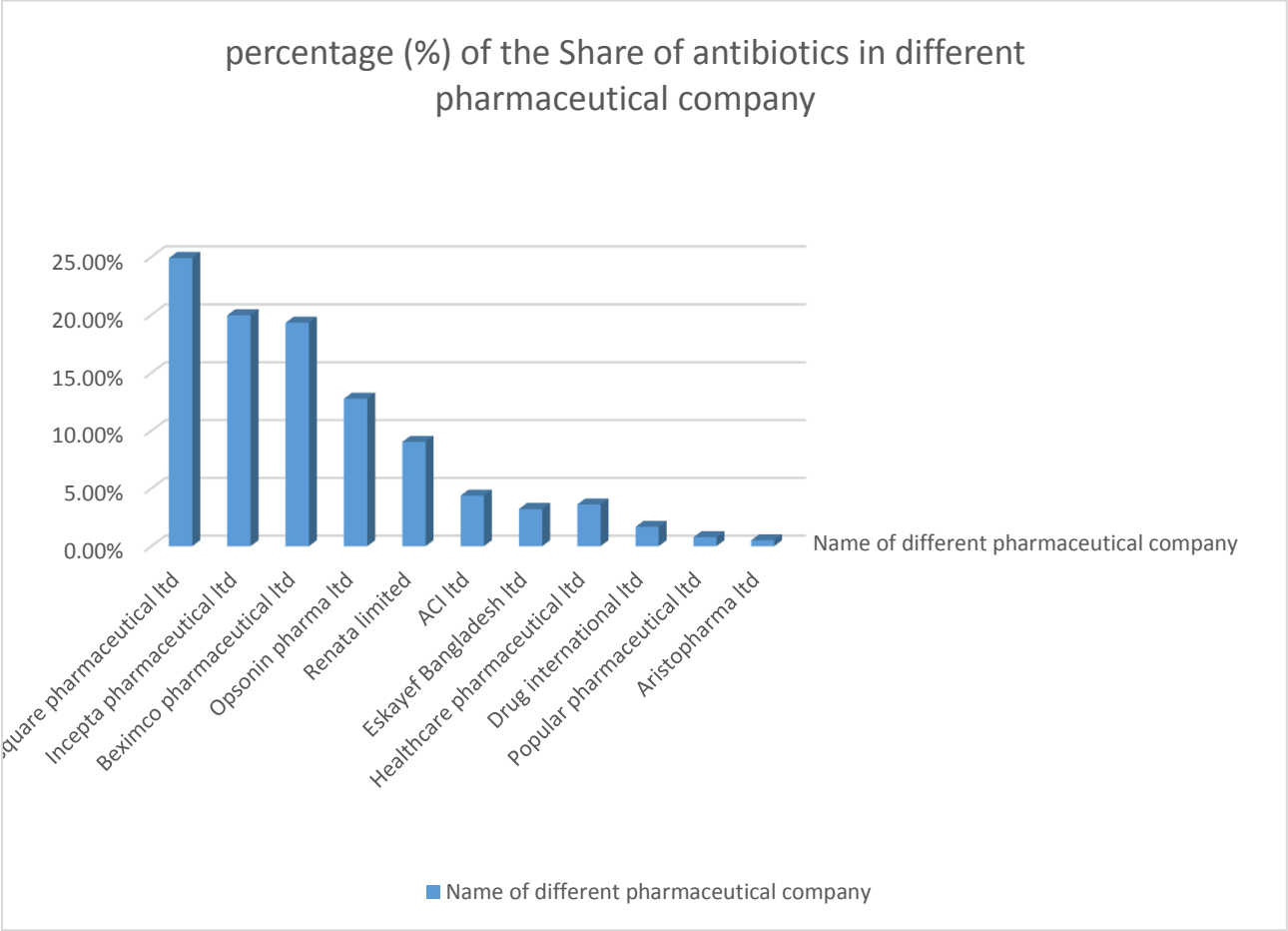

Figure 4.7.2: Percentage of the share of antibiotics among the different pharmaceutical company

From the above representation we have found that the, share of antibiotics among the different pharmaceutical company among the prescription I have collected is in Square pharmaceutical limited 24.87%, in Incepta pharmaceutical limited 19.97%, Beximco pharmaceutical limited 19.32%, in Opsoninpharma Ltd 12.76%, in Renata Ltd 9.03%, ACI Ltd 4.38%, inEskayef Bangladesh Ltd 3.22%, Healthcare pharma Ltd 3.61% , in Drug International Ltd 1.68%, in Popular pharmaceutical Ltd 0.65% and in Aristopharma Ltd 0.51%.from the result we show that the Square pharmaceutical Ltd shares highest antibiotics from the other pharmaceutical companies.

Discussion

A prescription by a doctor may be taken as a reflection of physicians' attitude to the disease and role of drug in its treatment. It also provides an insight into the nature of the health care delivery system.

In this survey there are 1600 prescription are collected from different area in Bangladesh. On this survey, 776 prescription out of 1600 contain Antibiotics and the percentage of prescription containing antibiotics is 48.5%.Among the total 1600 prescription, the number of the different section of prescription are in Medicine 916, Pediatrics 157, Orthopedics 127, Gastro liver 139, Gynecology 97, ENT 70 and Dermatology 94.

All the prescription contain 776 antibiotics among different specialist. Out of 776 prescription Medicine specialist prescribed antibiotics 334 and the percentage is 45.61%, orthopedics specialist prescribed antibiotics 80 and the percentage is 10.31%, pediatric specialist prescribed antibiotics 54 and the percentage is 6.96%, gastro-liver specialist prescribed antibiotics 54 and the percentage is 6.96%, ENT specialist prescribed antibiotics 64 and the percentage is 8.45%, Gynecology prescribed antibiotics 81 and the percentage is 10.44% and dermatologist prescribed antibiotics 89 and the percentage is 11.47%. On this study the highest area recognizes medicine specialist and dermatology specialist.

Antibiotics that included in EDL are Amoxicillin, Ampicillin, Benzathine benzyl-penicillin, Benzyl penicillin ,Ciprofloxacin, Clotrimazole, Cloxacillin, Doxycycline, Erythromycin, Gentamycin, Metronidazole, Nitrofurantoin, Paromomycin, Phenoxymethylpenicillin, Procaine benzylpenicllin, Streptomycin, Tetracycline

In this study, Among the 776 number of prescription containing antibiotics only 51.67% specialty followed EDL drug list and 48.33% does not follow EDL. This results in irrationality of the antibiotics in modern medical science. The possible reason for this lower value could be the prescribers lacking the understanding the importance of essential drug concept. The low rate of prescribing from EDL of Bangladesh may be also contributed by excessive use some drugs which are not enlisted in EDL of Bangladesh. So that the higher percentage of non-essential medicines prescription in this study is responsible for inappropriate use of medicines.

In this study, the percentage of antibiotics prescribed among their own specialty doctors is higher in dermatology (94.68%), then in ENT (91.43%), in gynecology (83.50%), in orthopedics (62.99%), in gastro-liver (38.85%), in medicine (38.65%) and in pediatrics (34.39%).This results that in dermatology and ENT specialist prescribed highest amount of antibiotics. The justification for this practice is not clear.

In this study, the percentage of the generic of Antibiotics show that the cefixime is the highest area of 24%, then prescribed commonly cefuroxime 20%, then ciprofloxacin 19% and metronidazole prescribed 17%, azithromycin and erythromycin prescribed commonly 7% and then amoxicillin prescribed 5% and others generic of antibiotics 1%.The percentage of drugs prescribed by generic name was 0% in the study which is very much less than that reported.

The most common reasons for not prescribing generic name in Bangladesh may be tradition, low production of generic drugs in Bangladesh and currently, most of the pharmaceutical company's divertive drug promotion technique. Use of generic names in prescription eliminate the chance of duplication of drug products and also reduce the cost of the patient and Prescribing using generic names is encouraged because it allows the patient to get the most cost-effective drug available without consideration of brand or manufacturer.

From the study we show that the percentage of Brand distribution among different pharmaceutical company, in Square pharmaceutical limited 24.87%, in Incepta pharmaceutical limited 19.97%, Beximco pharmaceutical limited 19.32%, in Opsoninpharma Ltd 12.76%, in Renata ltd 9.03%, ACI ltd 4.38%, in Eskayef Bangladesh ltd 3.22%, in Healthcare pharmaceutical ltd 3.61%, in Drug international ltd 1.68%, in Popular pharmaceutical ltd 0.65% and in Aristopharma ltd 0.51%. From the result we show that square pharmaceutical company are now in the first position to prescribed antibiotics.

Chapter Five

Conclusion

Conclusion

The study has been conducted on the basis of prescription pattern of antibiotics in different specialist of doctors in different area of Bangladesh. This kind of study will help to judge the rationality of prescribing antibiotics among the different specialist doctors in different areas of Bangladesh. So there is a considerable scope of improvement in the prescribing practices, especially prescribing by generic names which has less financial burden on patients. In other words rational drug must be strictly followed. So monitoring of use of antibiotic is very crucial in this time. The irrational use of antibiotics leads to the spread of bacterial resistance to antibiotics and related health problems, our findings have important implications for public education and the enforcement of regulations regarding the prescription of antibiotics in Bangladesh. The study also urges the physician to be more professional and careful when antibiotic is prescribed for the patients. Effective strategies should be taken by the Government of Bangladesh to reduce the use of antibiotics which could include the development of policies to support the judicious use of antibiotics, strengthen the control of antibiotics selling and implement educational campaigns for prescribers. For achieving the goal of rational use of medicine, it is essential to choose right medicine should be administered in the appropriate manner, keeping the number of medicine as low as possible, using generic names, using the medicine appropriately after selecting consciously keeping the cost of the therapy low and by consulting the WHO or National essential drug list. Specific prescription analysis correspondingly patient illness should be deeply studied in future to identifying the irrational and the prescribing tendency by forced.

Chapter Six

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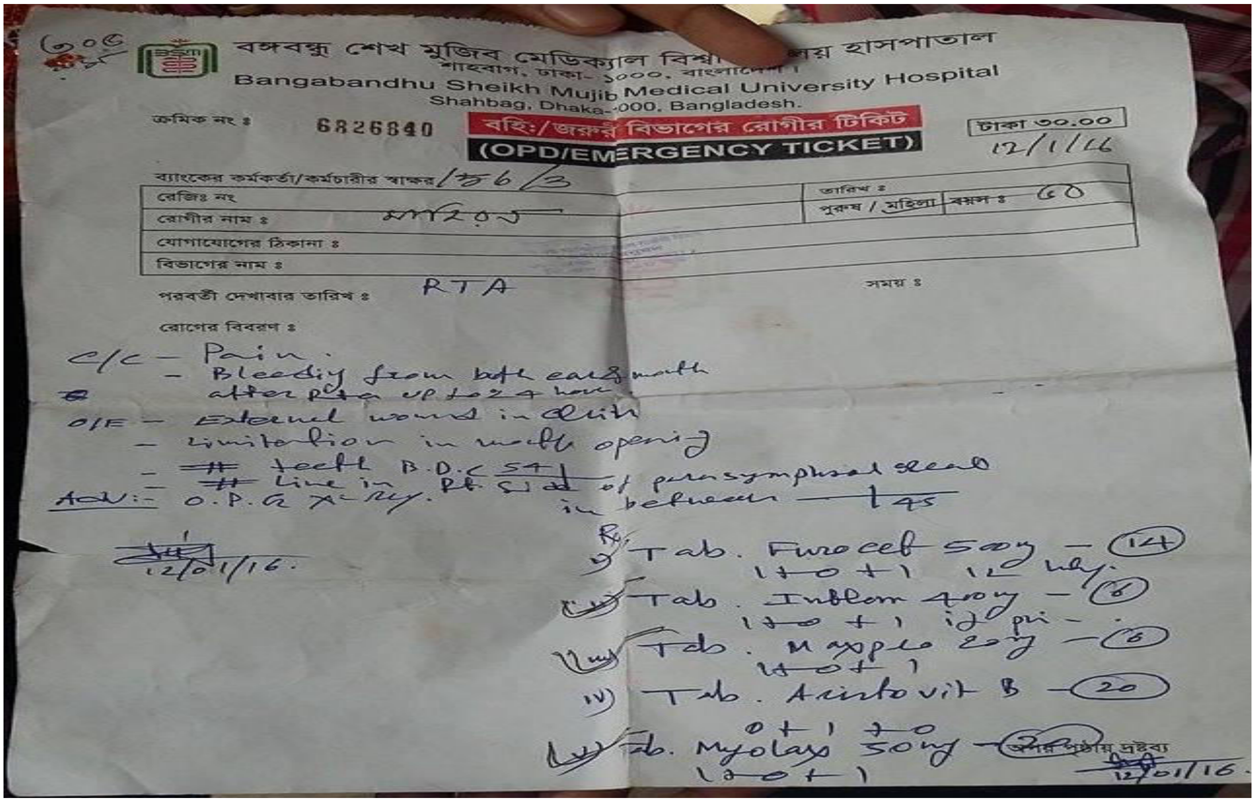
Annexure

Annexure



বঙ্গবন্ধু শেখ মুজিব মেডিক্যাল বিশ্ব... হাসপাতাল
শাহবাগ, ঢাকা- ১০০০, বাংলাদেশ।
Bangabandhu Sheikh Mujib Medical University Hospital
Shahbag, Dhaka-1000, Bangladesh.
ক্রমিক নং ঃ 6826840
বহিঃ/জরুরী বিভাগের রোগীর টিকিট
(OPD/EMERGENCY TICKET)
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যোগাযোগের ঠিকানা ঃ
বিভাগের নাম ঃ
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সময় ঃ
রোগের বিবরণ ঃ
C/C – Pain.
– Bleeding from both ear & mouth
O/E – External wound in chin
– Limitation in mouth opening
Adv:– O.P.G X-Ray.
12/01/16.
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i) Tab. Furocef 500mg – (14)
ii) Tab. Inflam 400mg – (6)
iii) Tab. Maxpro 20mg – (6)
iv) Tab. Aristovit B – (20)
v) Tab. Myolax 50mg
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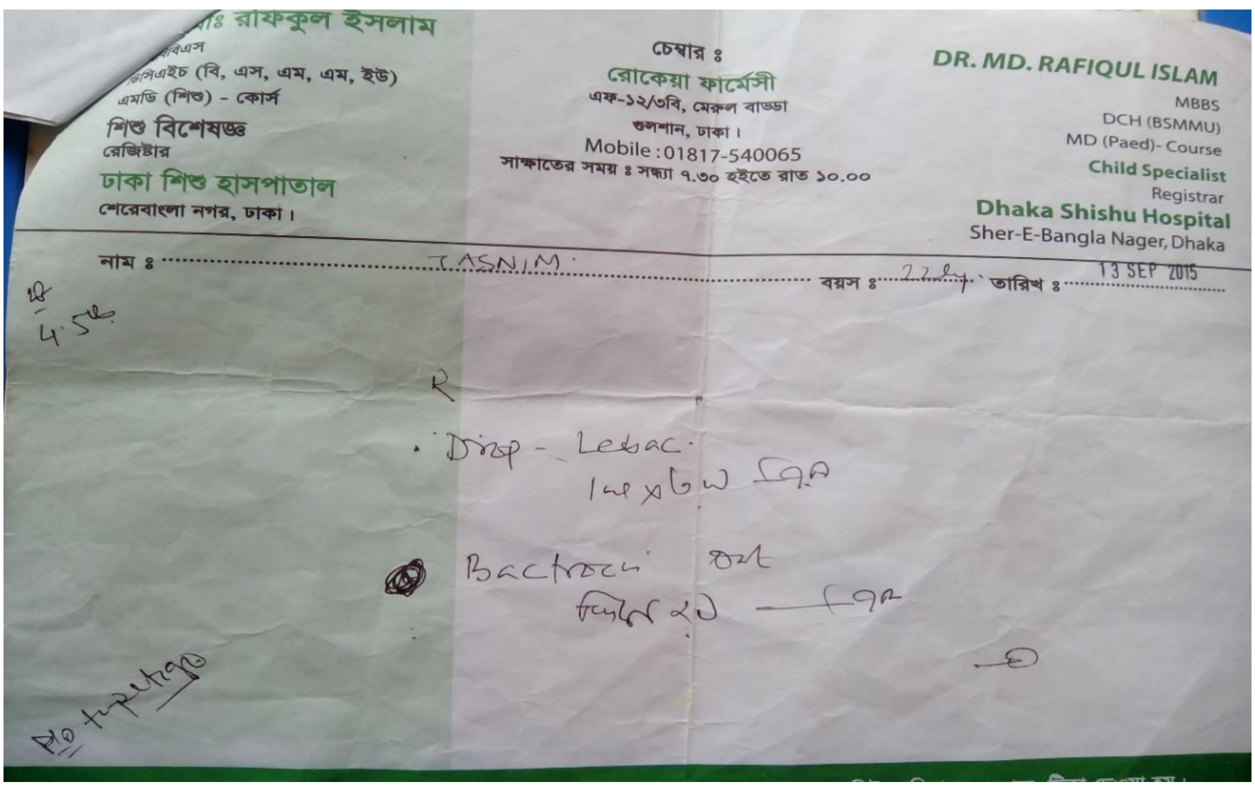

ডাঃ রাফকুল ইসলাম
এমবিবিএস
ডিসিএইচ (বি, এস, এম, এম, ইউ)
এমডি (শিশু) - কোর্স
শিশু বিশেষজ্ঞ
রেজিষ্টার
ঢাকা শিশু হাসপাতাল
শেরেবাংলা নগর, ঢাকা।
চেম্বার ঃ
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Dhaka Shishu Hospital
Sher-E-Bangla Nager, Dhaka
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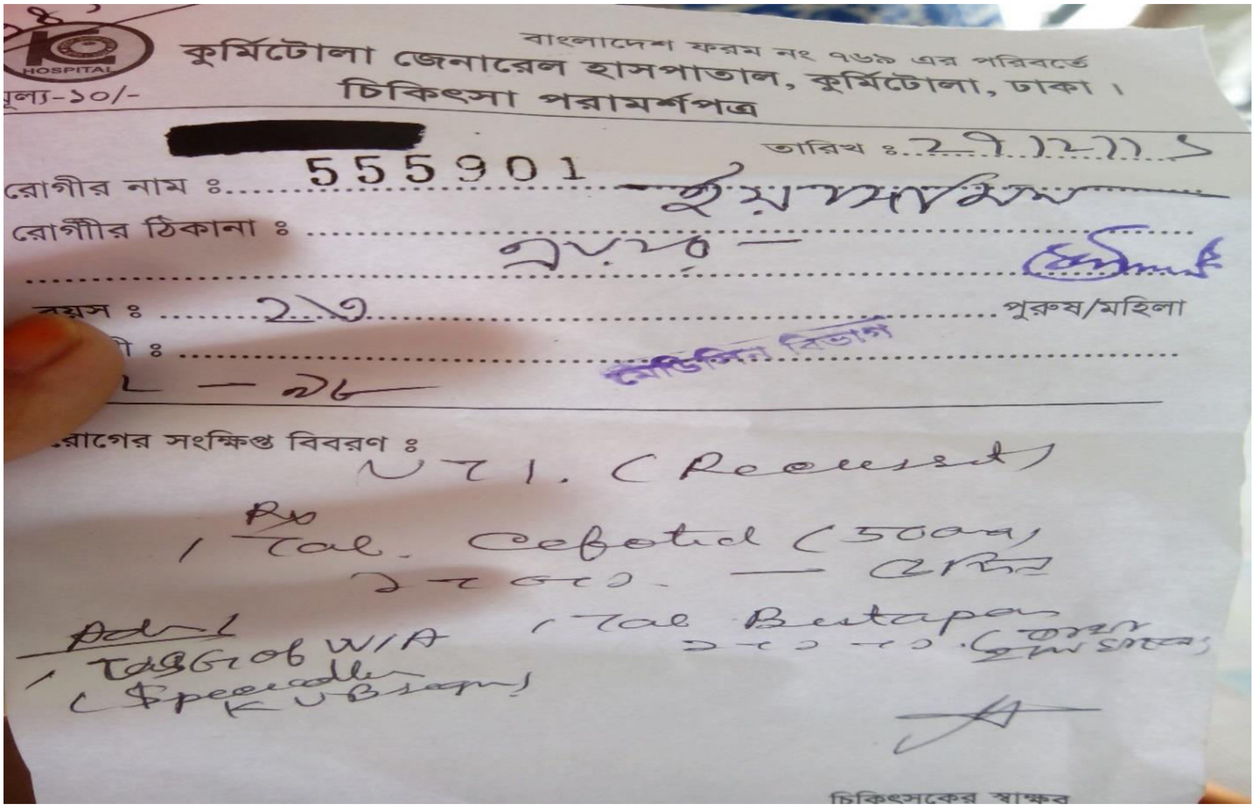
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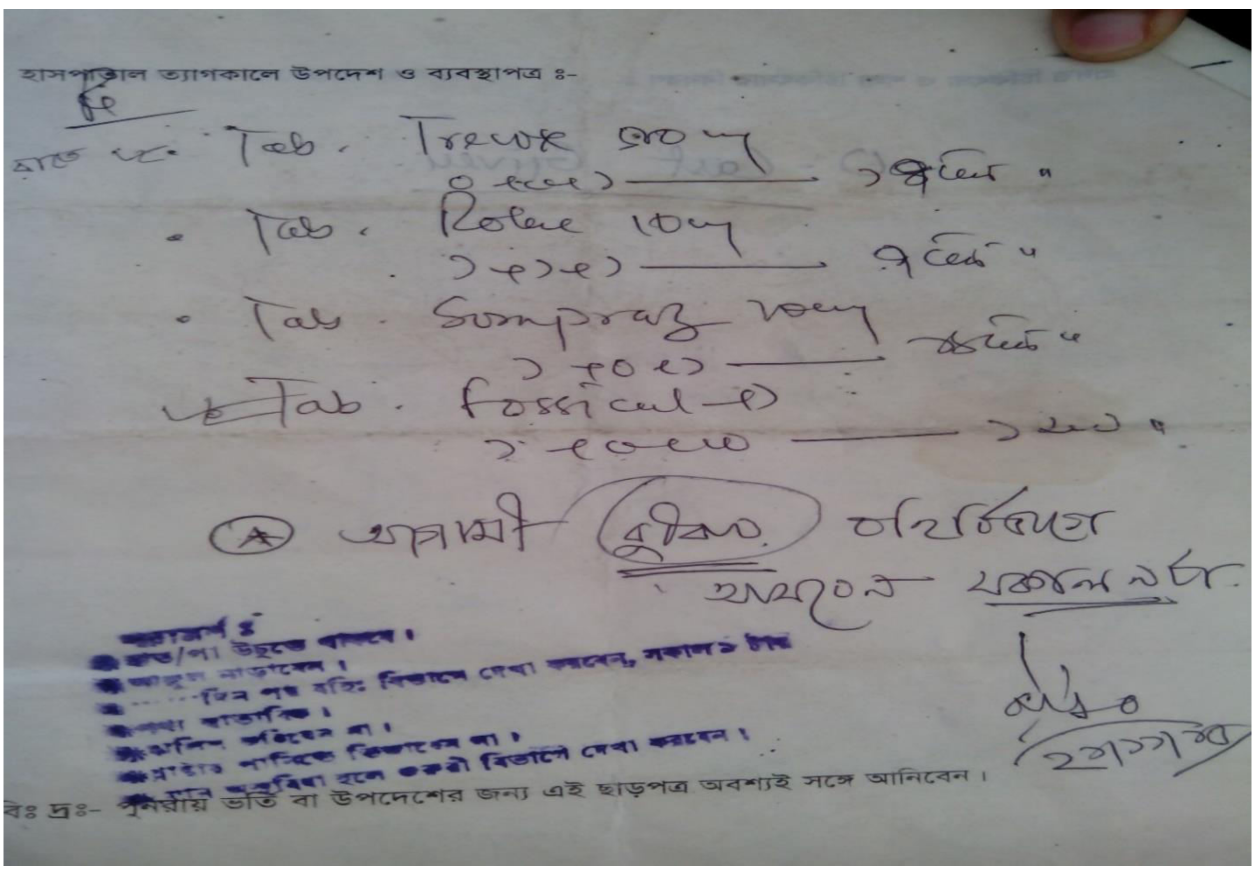
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Tab. Rolac 10mg
Tab. Sompraz 20mg
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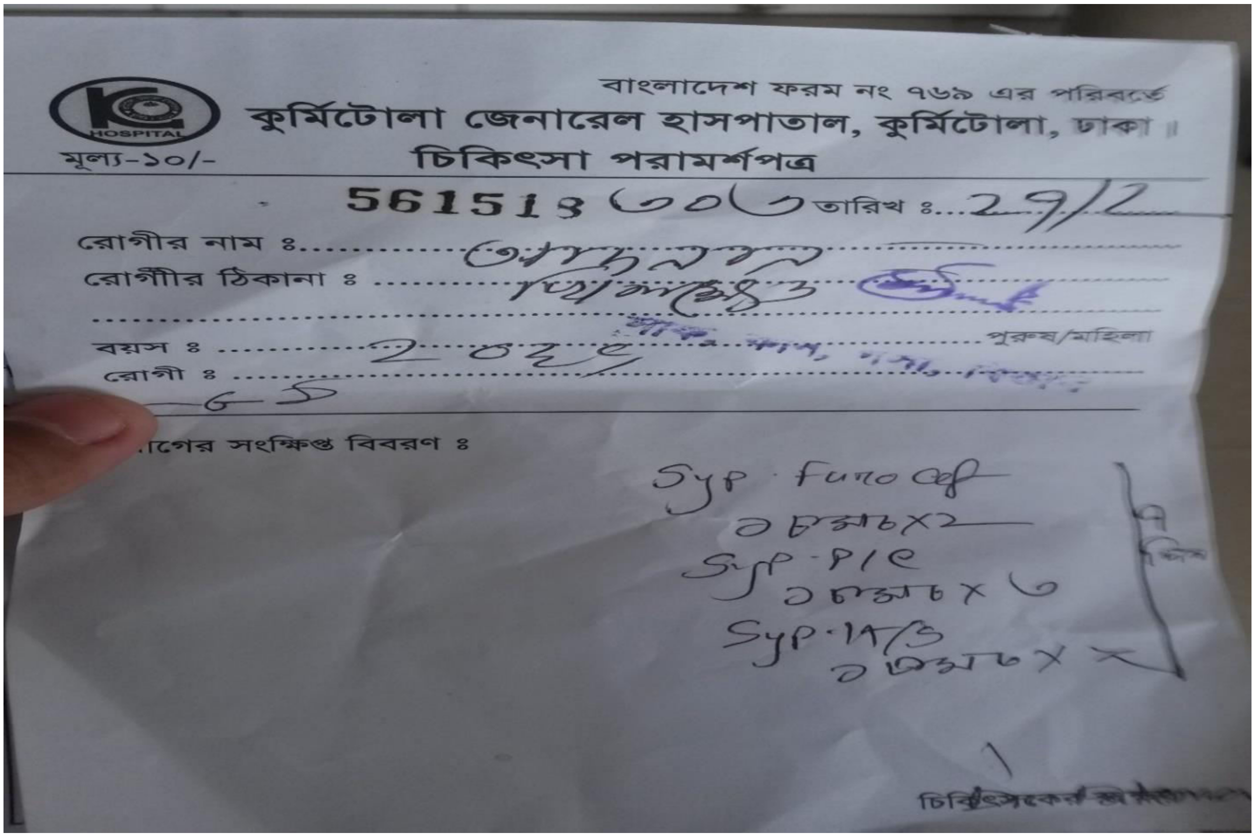
বিঃ দ্রঃ- পুনরায় ভর্তি বা উপদেশের জন্য এই ছাড়পত্র অবশ্যই সঙ্গে আনিবেন।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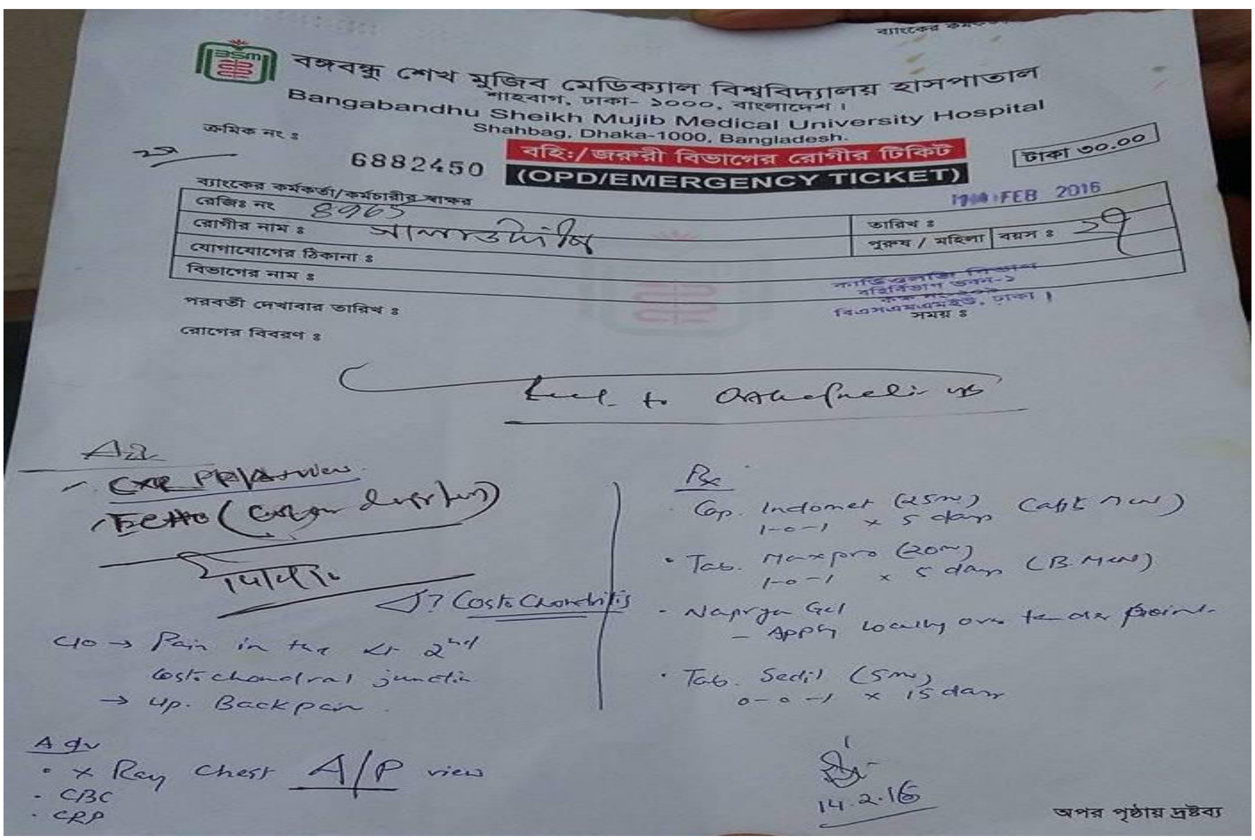
বঙ্গবন্ধু শেখ মুজিব মেডিক্যাল বিশ্ববিদ্যালয় হাসপাতাল

শাহবাগ, ঢাকা- ১০০০, বাংলাদেশ।

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ক্রমিক নং ঃ 6882450

বহিঃ/জরুরী বিভাগের রোগীর টিকিট

(OPD/EMERGENCY TICKET)

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তারিখ ঃ 14 FEB 2016

পুরুষ / মহিলা | বয়স ঃ 29

যোগাযোগের ঠিকানা ঃ

বিভাগের নাম ঃ

পরবর্তী দেখাবার তারিখ ঃ

রোগের বিবরণ ঃ

Rx

Cap. Indomet (25mg) 1-0-1 x 5 days

Tab. Maxpro (20mg) 1-0-1 x 5 days

Apply locally over tender point

Tab. Sedil (5mg) 0-0-1 x 15 days

Adv

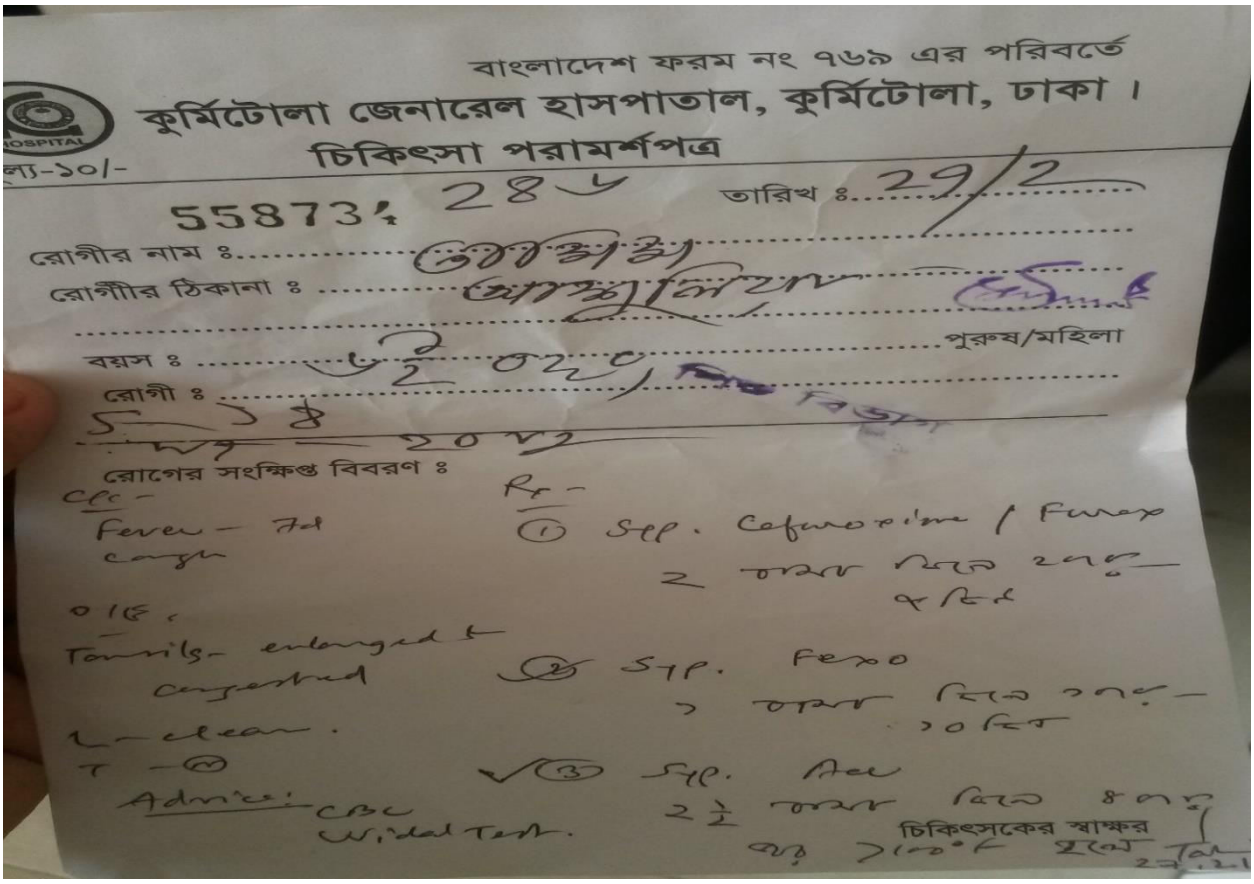
X Ray Chest A/P view

CBC

CRP

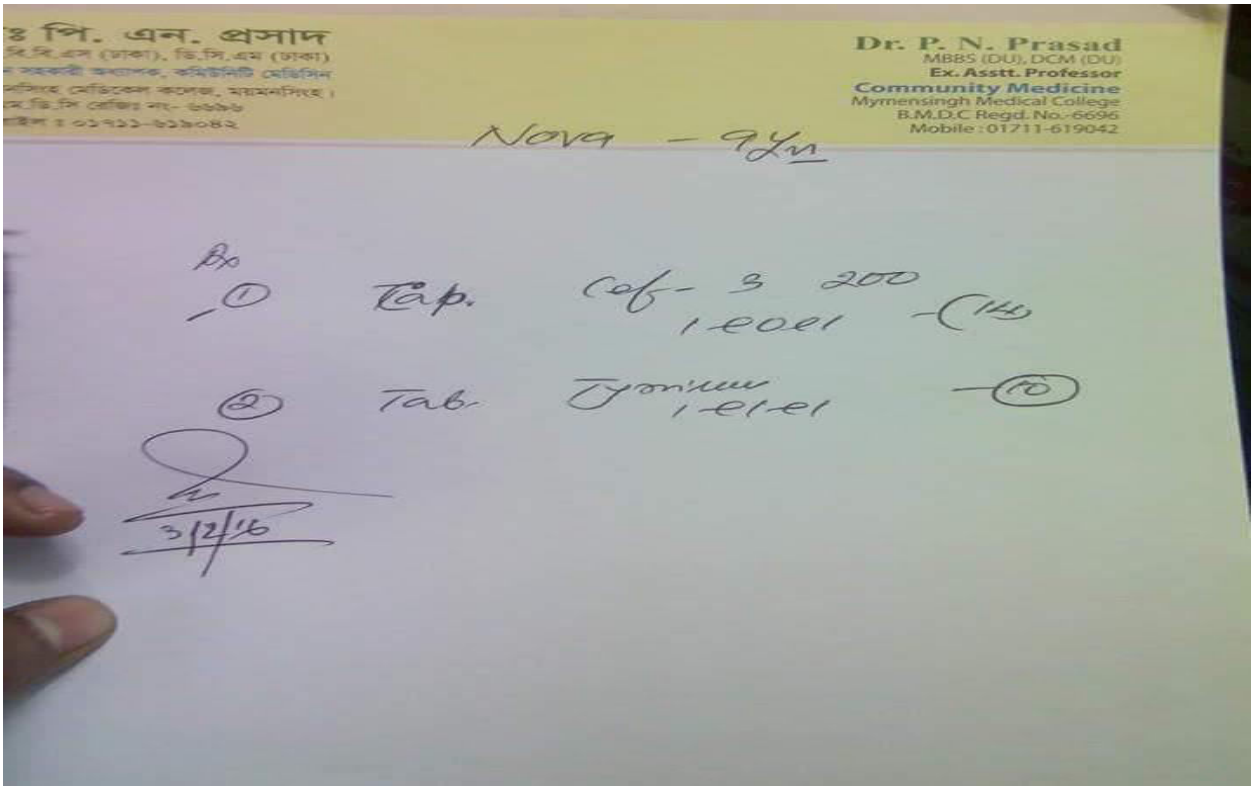
14.2.16

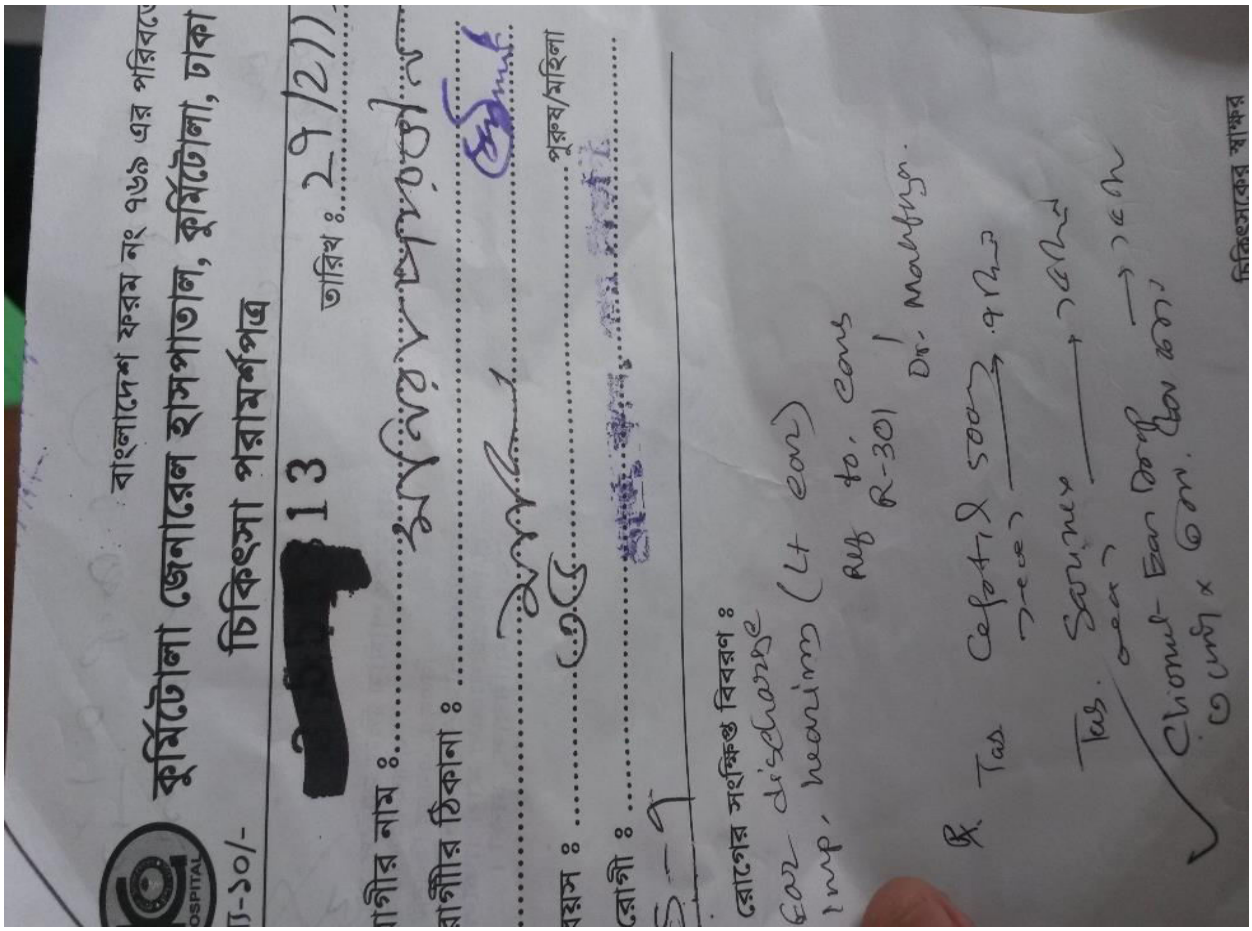
অপর পৃষ্ঠায় দ্রষ্টব্য


বাংলাদেশ ফরম নং ৭৬৯ এর পরিবর্তে

কুর্মিটোলা জেনারেল হাসপাতাল, কুর্মিটোলা, ঢাকা।

চিকিৎসা পরামর্শপত্র


Dr. P. N. Prasad
MBBS (DU), DCM (DU)
Ex. Asstt. Professor
Community Medicine
Mymensingh Medical College
B.M.D.C Regd. No.-6696
Mobile : 01711-619042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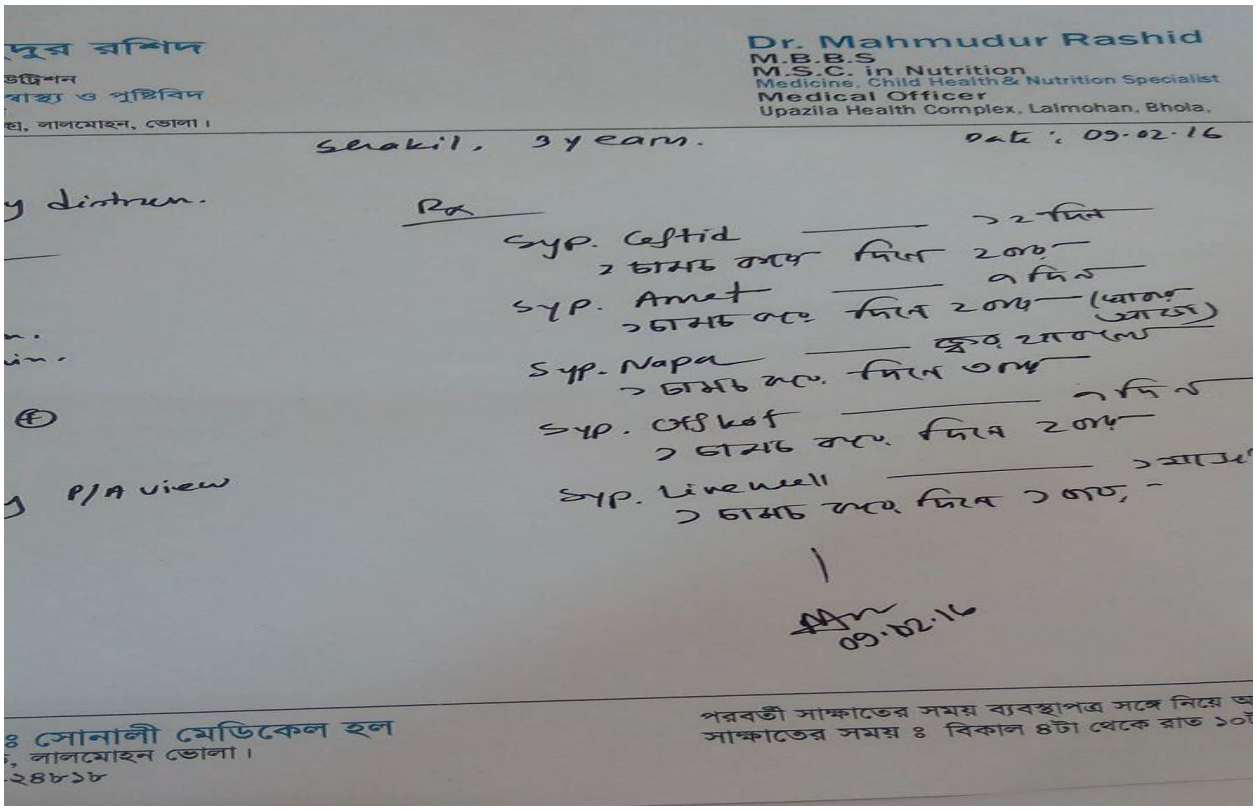
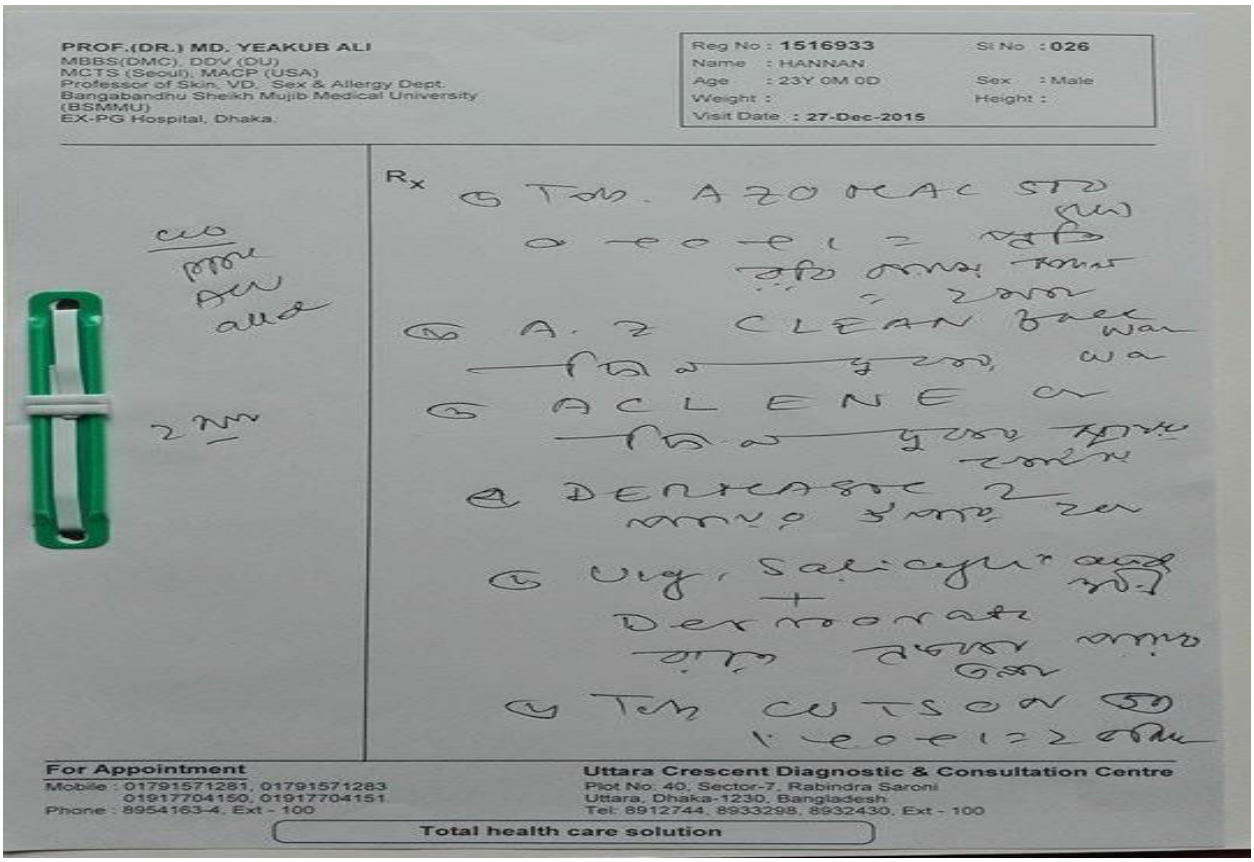
চিকিৎসা পরামর্শপত্র
তারিখ ঃ 29/2/16
রোগীর নাম ঃ
রোগীর ঠিকানা ঃ
বয়স ঃ
পুরুষ/মহিলা
রোগী ঃ
রোগের সংক্ষিপ্ত বিবরণ ঃ
Ear discharge
Inf. Vomiting (Lt ear)
Adv to. ENT
R-301
Dr. Mahfuz
Rx Tab Ceftriaxone 500mg 1+0+1
Tab. Sumo 1+0+1
Clomul-Ear Drop 2+0+2
চিকিৎসকের স্বাক্ষর


Dr. Mahmudur Rashid
M.B.B.S
M.S.C. in Nutrition
Medicine, Child Health & Nutrition Specialist
Medical Officer
Upazila Health Complex, Lalmohan, Bhola.
Shakil, 3 years.
Date : 09.02.16
Rx
Syp. Ceftid
Syp. Amet
Syp. Napa
Syp. Ofloxacin
Syp. Livewell
P/A view
09.02.16
সোনালী মেডিকেল হল
লালমোহন ভোলা।
পরবর্তী সাক্ষাতের সময় ব্যবস্থাপত্র সঙ্গে নিয়ে
সাক্ষাতের সময় ঃ বিকাল ৪টা থেকে রাত ১০



PROF.(DR.) MD. YEAKUB ALI
MBBS(DMC), DDV (DU)
MCTS (Seoul), MACP (USA)
Professor of Skin, VD, Sex & Allergy Dept.
Bangabandhu Sheikh Mujib Medical University (BSMMU)
EX-PG Hospital, Dhaka.

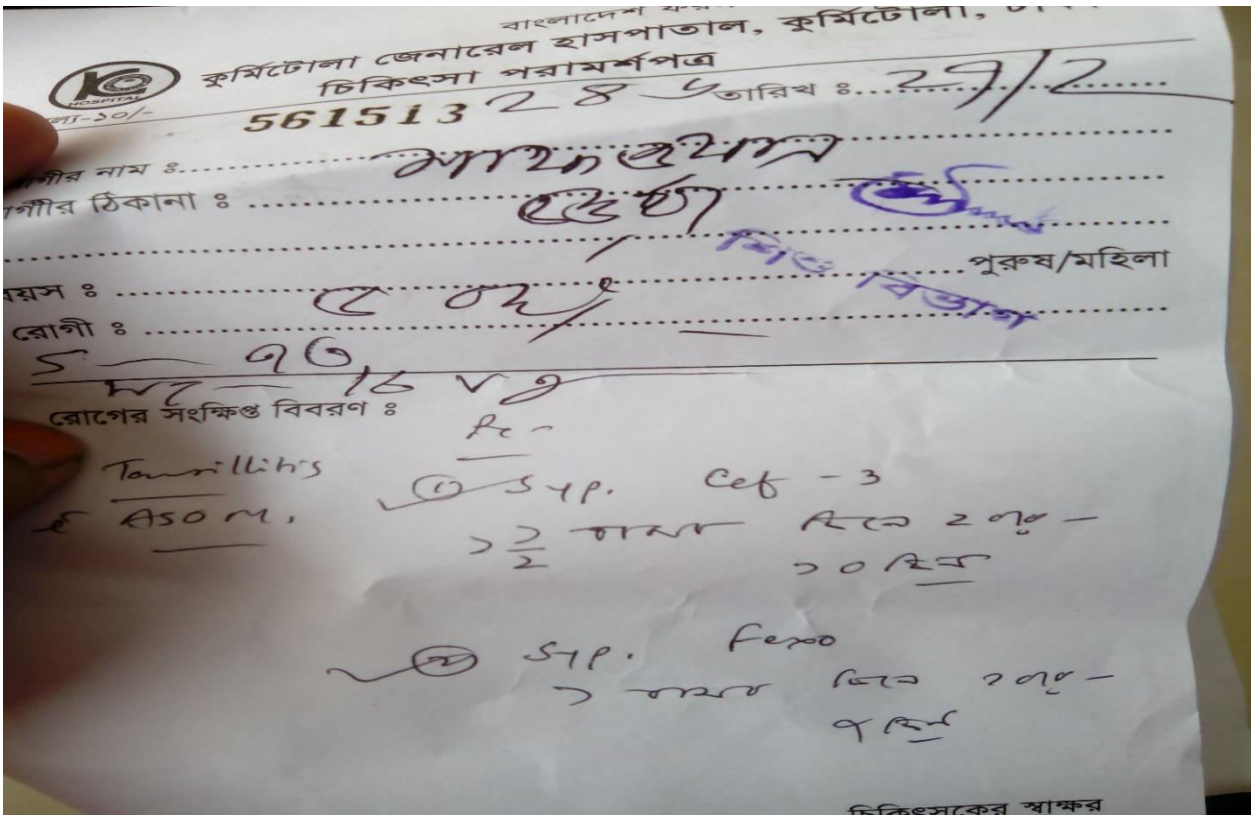
Reg No : 1516933 Sl No : 026
Name : HANNAN
Age : 23Y 0M 0D Sex : Male
Weight : Height :
Visit Date : 27-Dec-2015

Rx

For Appointment
Mobile : 01791571281, 01791571283
01917704150, 01917704151
Phone : 8954163-4, Ext - 100

Uttara Crescent Diagnostic & Consultation Centre
Plot No: 40, Sector-7, Rabindra Saroni
Uttara, Dhaka-1230, Bangladesh
Tel: 8912744, 8933298, 8932430, Ext - 100

Total health care solution

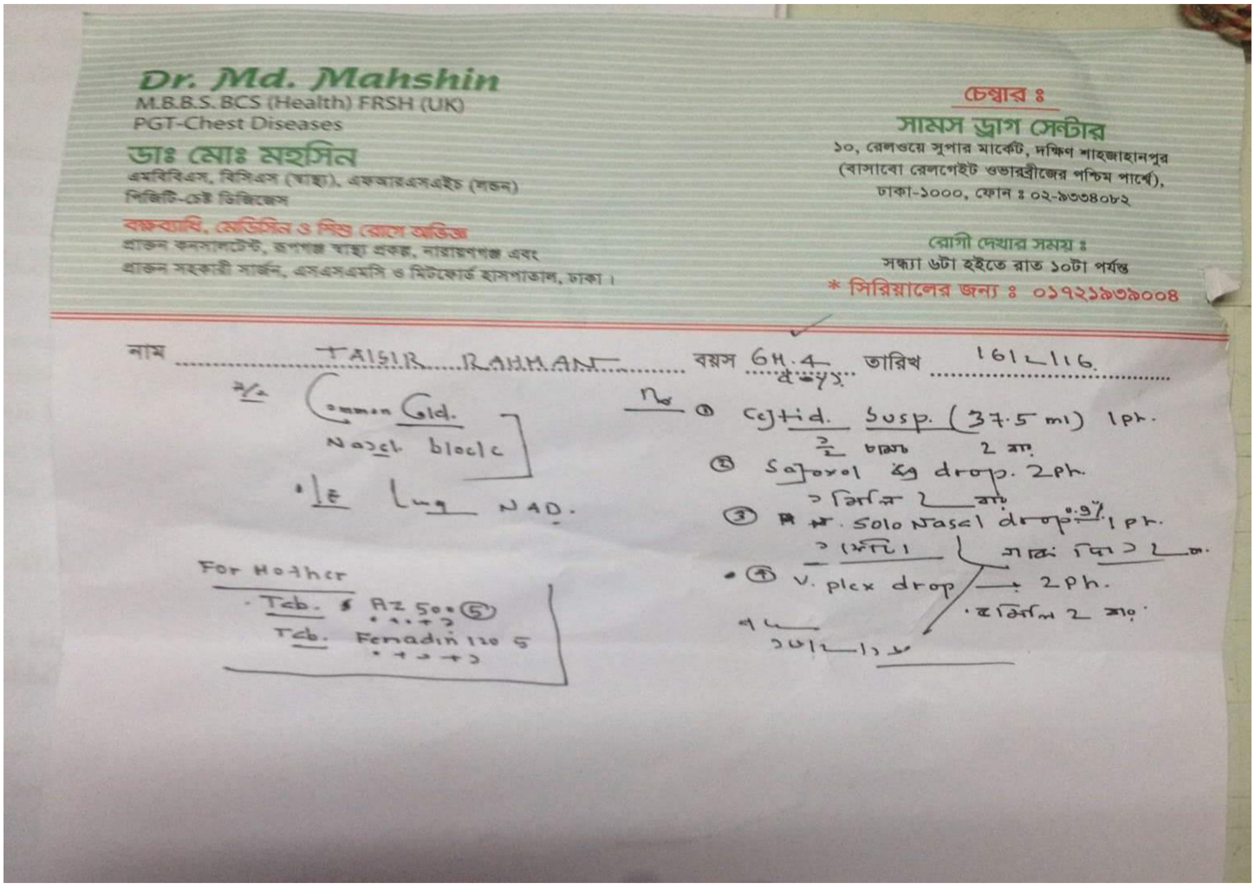


কুর্মিটোলা জেনারেল হাসপাতাল, কুর্মিটোলা,
চিকিৎসা পরামর্শপত্র
561513 28 তারিখ : 27/12

রোগীর নাম :
রোগীর ঠিকানা :
বয়স : পুরুষ/মহিলা
রোগী :
রোগের সংক্ষিপ্ত বিবরণ :

Rx

চিকিৎসকের স্বাক্ষর



Dr. Md. Mahshin
M.B.B.S. BCS (Health) FRSH (UK)
PGT-Chest Diseases
ডাঃ মোঃ মহসিন
এমবিবিএস, বিসিএস (স্বাস্থ্য), এফআরএসএইচ (লন্ডন)
পিজিটি-চেষ্ট ডিজিজেস
বক্ষব্যাধি, মেডিসিন ও শিশু রোগে অভিজ্ঞ
প্রাক্তন কনসালটেন্ট, রূপগঞ্জ স্বাস্থ্য প্রকল্প, নারায়ণগঞ্জ এবং
প্রাক্তন সহকারী সার্জন, এসএসএমসি ও মিটফোর্ড হাসপাতাল, ঢাকা।

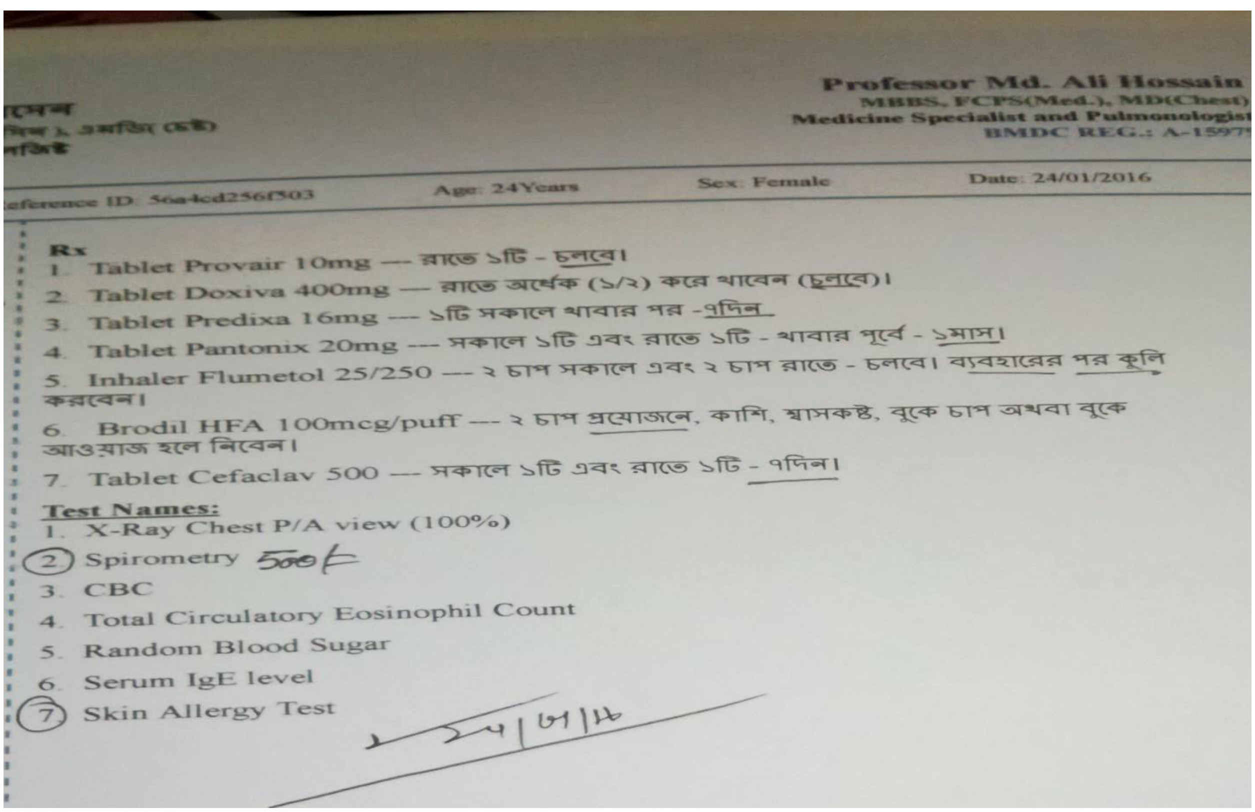
চেম্বার ঃ
সামস ড্রাগ সেন্টার
১০, রেলওয়ে সুপার মার্কেট, দক্ষিণ শাহজাহানপুর
(বাসাবো রেলগেইট ওভারব্রীজের পশ্চিম পার্শ্বে),
ঢাকা-১০০০, ফোন ঃ ০২-৯৩৩৪০৮২
রোগী দেখার সময় ঃ
সন্ধ্যা ৬টা হইতে রাত ১০টা পর্যন্ত
* সিরিয়ালের জন্য ঃ ০১৭২১৯৩৯০০৪

নাম TAISIR RAHMAN বয়স 6M.4 তারিখ 16/1/16

C/o Common Cold.
Nasal block
Lt Lung NAD.

Rx
① Cefotid. Susp. (37.5 ml) 1ph.
② Sofoxol drop. 2ph.
③ Solo Nasal drop 0.9% 1ph.
④ V. plex drop 2ph.

For Mother
Tab. Az 500 (5)
Tab. Fenadin 120 5



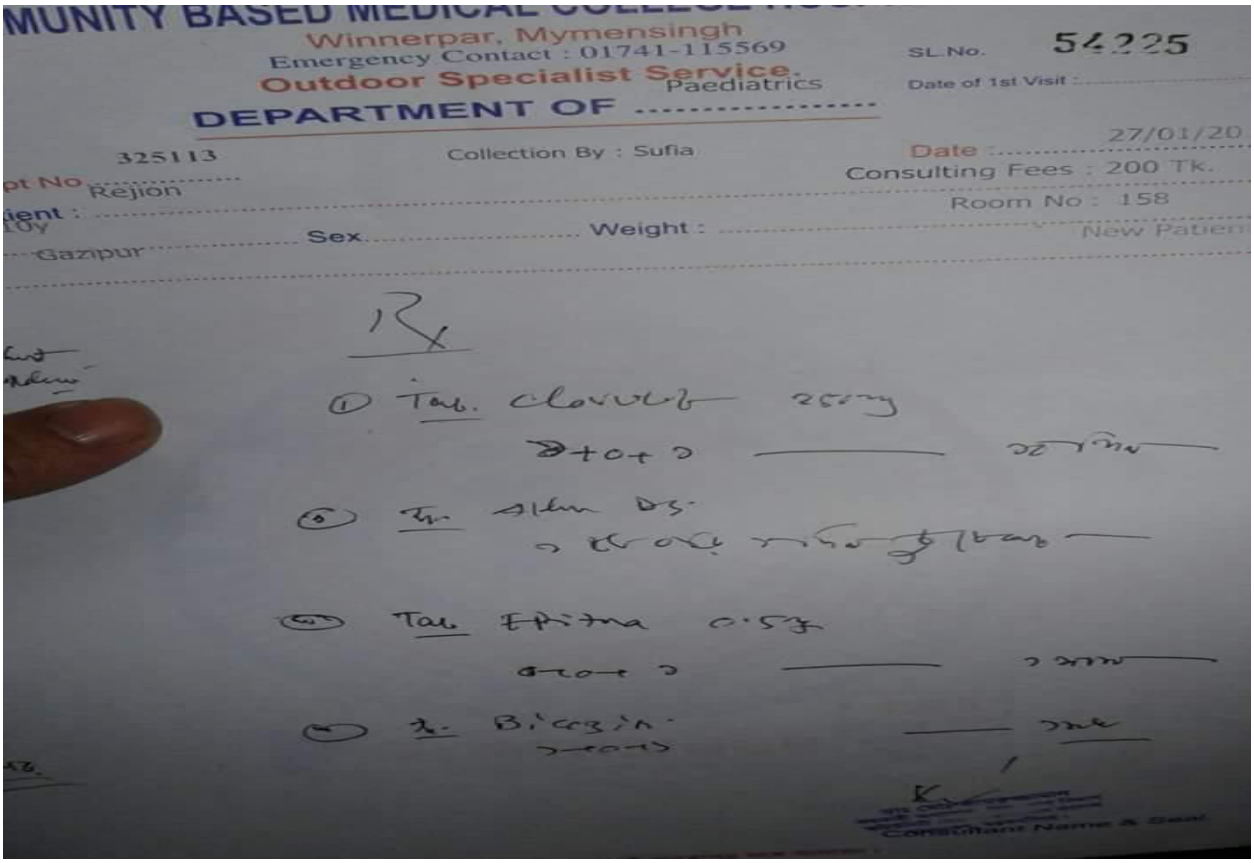
Professor Md. Ali Hossain
MBBS, FCPS(Med.), MD(Chest)
Medicine Specialist and Pulmonologist
BMDC REG.: A-1597

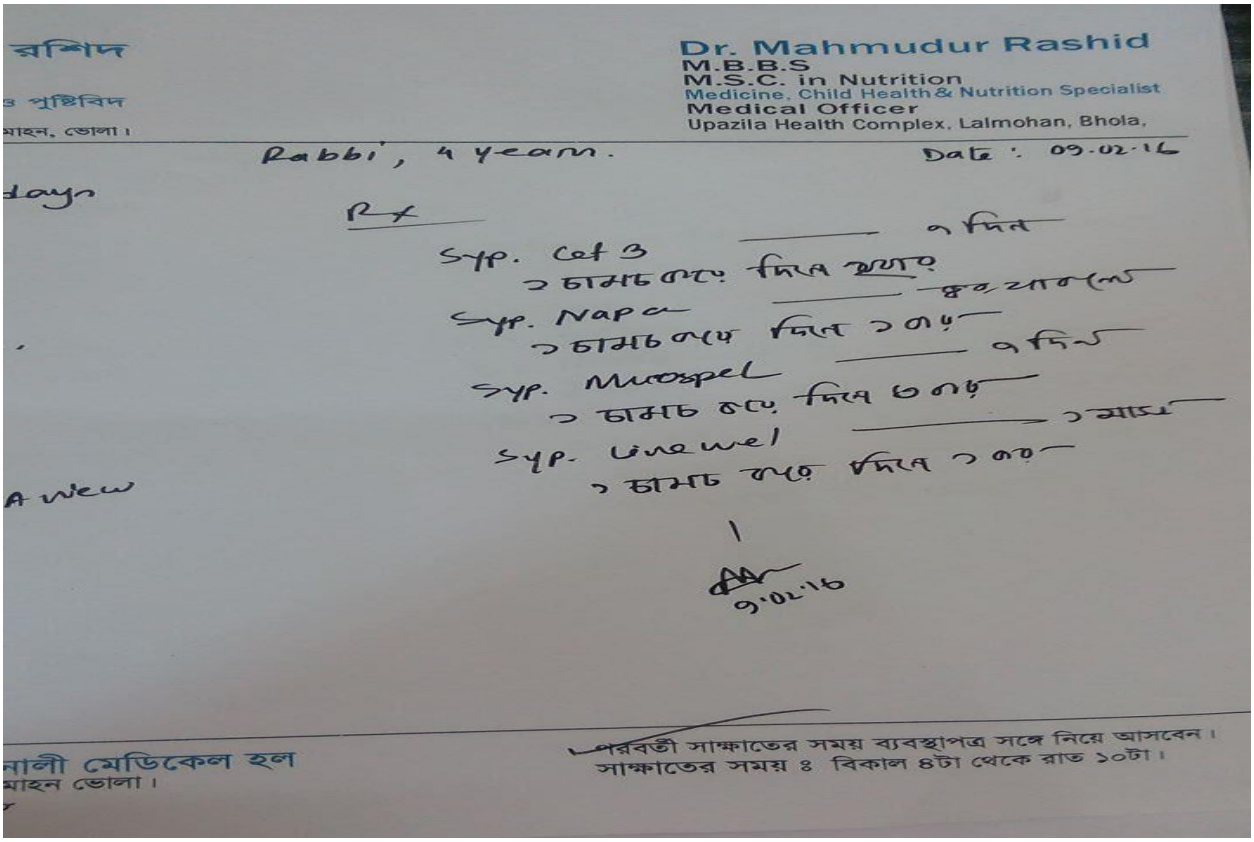
Reference ID: 56a4cd256f503 | Age: 24Years | Sex: Female | Date: 24/01/2016

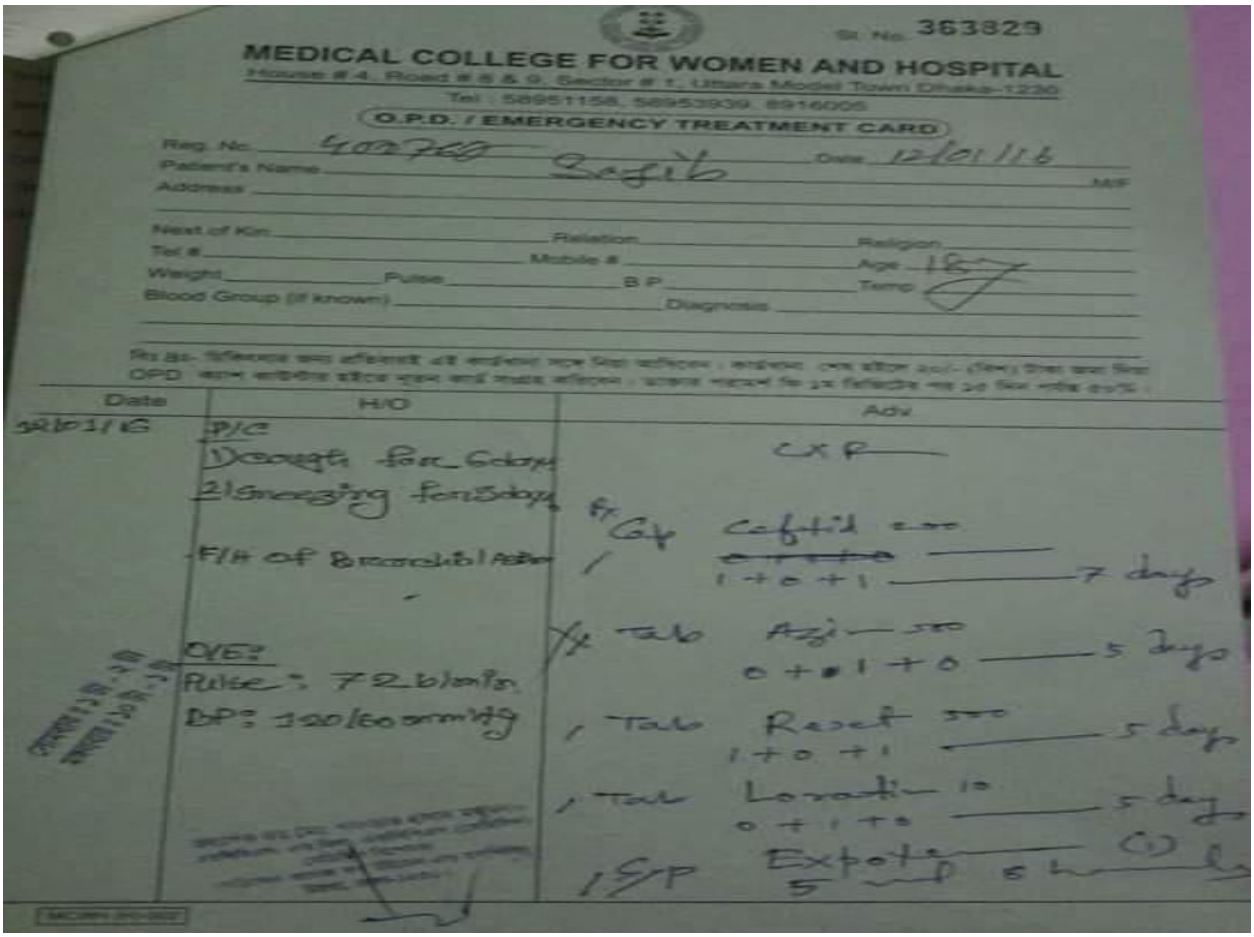
Rx
1. Tablet Provair 10mg --- রাতে ১টি - চলবে।
2. Tablet Doxiva 400mg --- রাতে অর্ধেক (১/২) করে খাবেন (চলবে)।
3. Tablet Predixa 16mg --- ১টি সকালে খাবার পর -৭দিন
4. Tablet Pantonix 20mg --- সকালে ১টি এবং রাতে ১টি - খাবার পূর্বে - ১মাস।
5. Inhaler Flumetol 25/250 --- ২ চাপ সকালে এবং ২ চাপ রাতে - চলবে। ব্যবহারের পর কুলি করবেন।
6. Brodil HFA 100mcg/puff --- ২ চাপ প্রয়োজনে, কাশি, শ্বাসকষ্ট, বুকে চাপ অথবা বুকে আওয়াজ হলে নিবেন।
7. Tablet Cefaclav 500 --- সকালে ১টি এবং রাতে ১টি - ৭দিন।

Test Names:
1. X-Ray Chest P/A view (100%)
2. Spirometry 500/-
3. CBC
4. Total Circulatory Eosinophil Count
5. Random Blood Sugar
6. Serum IgE level
7. Skin Allergy Test

24/01/16

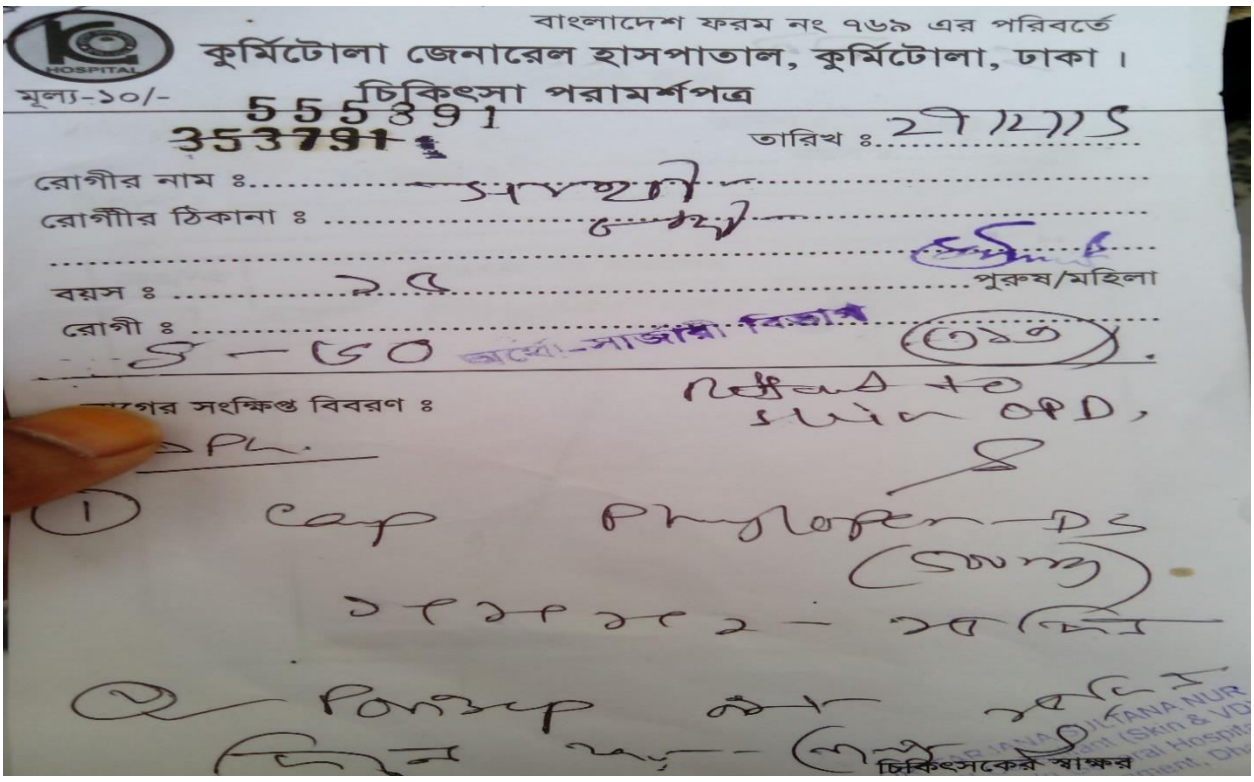

MUNITY BASED
Winnerpar, Mymensingh
Emergency Contact : 01741-115569
Outdoor Specialist Service.
Paediatrics
DEPARTMENT OF
SL No. 54225
Date of 1st Visit :
325113
Collection By : Sufia
Date : 27/01/20
Consulting Fees : 200 Tk.
Room No : 158
Rejion
Gazipur
Sex
Weight :
New Patien
Rx


Dr. Mahmudur Rashid
M.B.B.S
M.S.C. in Nutrition
Medicine, Child Health & Nutrition Specialist
Medical Officer
Upazila Health Complex, Lalmohan, Bhola,
Rabbi, 4 years.
Date : 09.02.16
Rx
Syp. Cef 3
Syp. Napa
Syp. Mucopel
Syp. Linewel
9.02.16
পরবর্তী সাক্ষাতের সময় ব্যবস্থাপত্র সঙ্গে নিয়ে আসবেন।
সাক্ষাতের সময় ঃ বিকাল ৪টা থেকে রাত ১০টা।

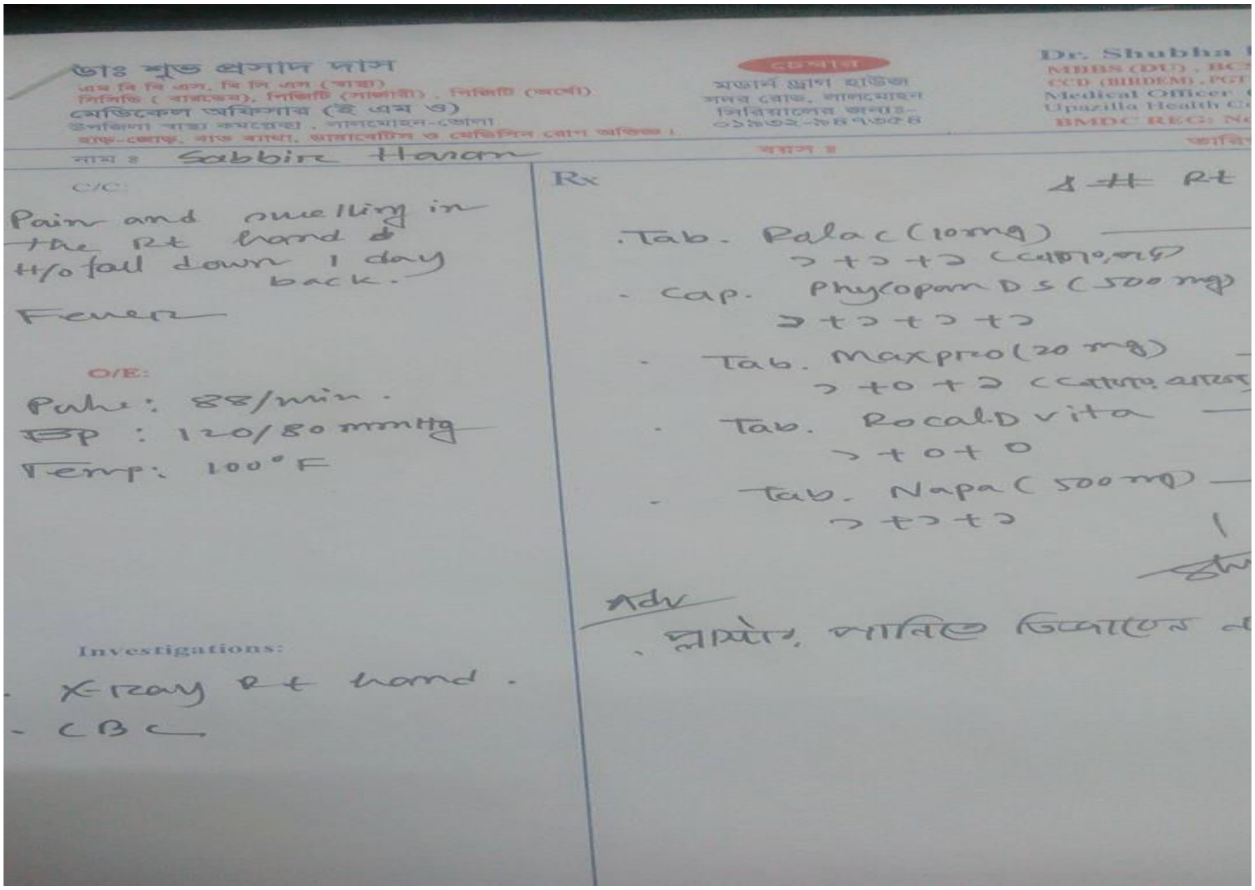

MEDICAL COLLEGE FOR WOMEN AND HOSPITAL

O.P.D. / EMERGENCY TREATMENT CARD

Date | H/O | Adv


কুর্মিটোলা জেনারেল হাসপাতাল, কুর্মিটোলা, ঢাকা।

চিকিৎসা পরামর্শপত্র


ডাঃ শুভ প্রসাদ দাস

Dr. Shubha

MBBS (DU), BC

CCD (BIRDEM), PGT

Medical Officer

Upazilla Health C

BMDC REG: N

নাম : Sabbir Hasan

বয়স :

C/C:

Pain and swelling in the Rt hand & H/o fall down 1 day back.

Fever

O/E:

Pulse: 88/min.

BP: 120/80 mmHg

Temp: 100°F

Investigations:

- X-ray Rt hand.
- CBC

Rx

Tab. Palac (10mg)
1+1+1

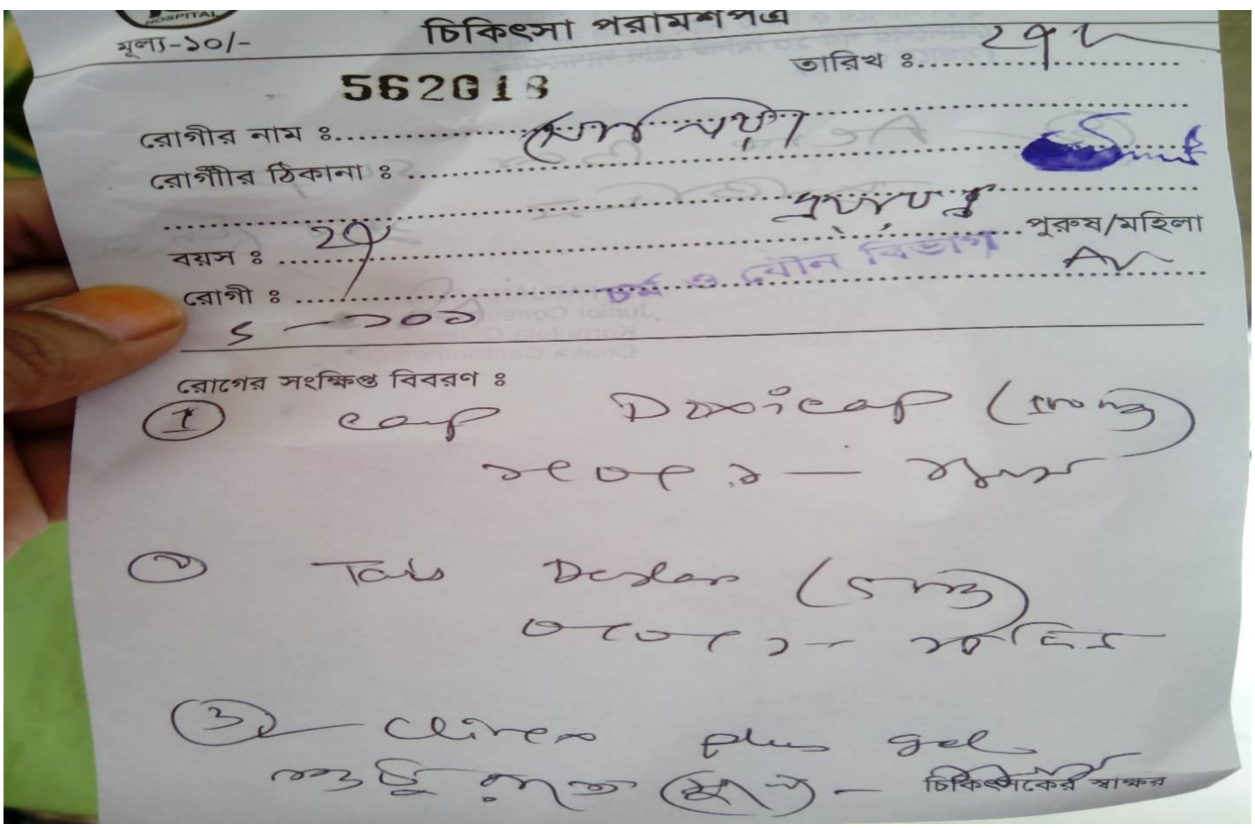
Cap. Phylopen DS (500 mg)
1+1+1+1

Tab. Maxpro (20 mg)
1+0+1

Tab. Rocal D vita
1+0+0

Tab. Napa (500 mg)
1+1+1

Adv


চিকিৎসা পরামর্শপত্র

মূল্য-১০/-

562018

তারিখ :

রোগীর নাম :

রোগীর ঠিকানা :

পুরুষ/মহিলা

বয়স : 29

রোগী :

রোগের সংক্ষিপ্ত বিবরণ :

(1) cap Doxicap (100 mg)

(2) Tab Deslor (5 mg)

(3) Clinex plus gel

চিকিৎসকের স্বাক্ষর