Summer Training at
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(May 1 -June 15, 2012)

Study on Market Share of Dicloxacilline Combination Among Different Faculty of Doctors and Chemist

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Under the guidance of
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Certificate

This is to certify that Puneet Sethi has undergone summer training in Abbott Healthcare, Jaipur from 1st May to 15th June, 2012

The candidate carried out all the studies related to summer training himself. His approach to the studies has been sincere, scientific, and analytical. This summer training in partial fulfillment of the course requirement is recommended for the award of Post Graduate Diploma in Pharmaceutical Management.

I wish his success in all future endeavors.

Dr. P.R. Sodani
(Dean Academics and student affairs)

Dr. J. P Singh
(Assistant Professor)

ACKNOWLEDGEMENT

Any effort, which gives promising result, isn't a work of one man or one day. A team work is always appreciated and required to make a vast project to people in charge at success. Along with team work, the proper guidance and help from surrounding and people in charge is the most important aspect to make the project useful for future, Here I express my thanks to **Ashish Bhargava (ZBM, Multi Therapy, Abbott Laboratories)** the project mentor for providing me with the opportunity to work on such a good project and also providing me the time along with valuable guidance.

No problem can survive without the regular check and guidance of a quick thinker ,cooperative and oriented guide none less than ,my project guide **Dr. J.P Singh** has proved to be the boon for the project .Without this support ,optimistic approach and friendly attitude thus project could not have seen the light of day.

There is nothing is possible without his omnipresence. He stand in front of us to show the path and led to success: I bowed down to that almighty. I also thankful to my parents for giving me the guidance , motivation and stands behind me all the way for fulfilling my all the needs with bearing all the pain for my success.

Puneet Sethi
IIHMR
PGDPM03

TABLE OF CONTENTS

TYPE OF TABLE

TYPE OF FIGURE

ABBREVIATIONS

PBPs	**Penicillin-binding proteins**
ADRs	**Adverse drug reactions**
CBC	**Complete Blood Count**
BUN	**Blood Urea Nitrogen**
HIV	**Human immunodeficiency virus**
S.M.S	**Sawai Man Singh**
SDMH	**Santokba Durlabhji Memorial Hospital**
ENT	**Ear, Nose, Throat**
SWOT	**Strength, Weakness, Opportunities, Threats**
FDA	**Food & Drug Administration**
FES	**Fuerza Especial Silanes**
PFE	**Peak expiratory flow**
PCR	**Polymerase chain reaction**

INTRODUCTION

INTRODUCTION

❑ ANTIBIOTIC

An antibiotic is any substance produced by a microorganism, i.e. bacteria or fungi that it sends outside its cell to harm or kill another microorganism. The benefit is easy to see. If an organism is able to produce chemicals that inhibit or kill other nearby organisms, it has an advantage in competing for local resources.

Technically, antibiotics are microbial or fungal products. But we are able to synthesize and mass produce these chemical substances in the laboratory to use against harmful microorganisms in our environment. There is a distinction between natural and synthetic antibiotics, but in practice most drugs used to combat microbial and fungal infections are grouped under the general heading "antibiotics".

Antibiotic drugs are classified according to:

1) Their range of effectiveness, are they broad or narrow spectrum, i.e. do they affect many pathogens or only a few select strains?
2) The general microbial group they act against: antibacterial, antifungal, or antiprotozoan
3) Size and shape: bacteria can be rods, or spherical, and exist as chains or single individuals
4) How they stain in a procedure called a Gram stain.

Classification:-

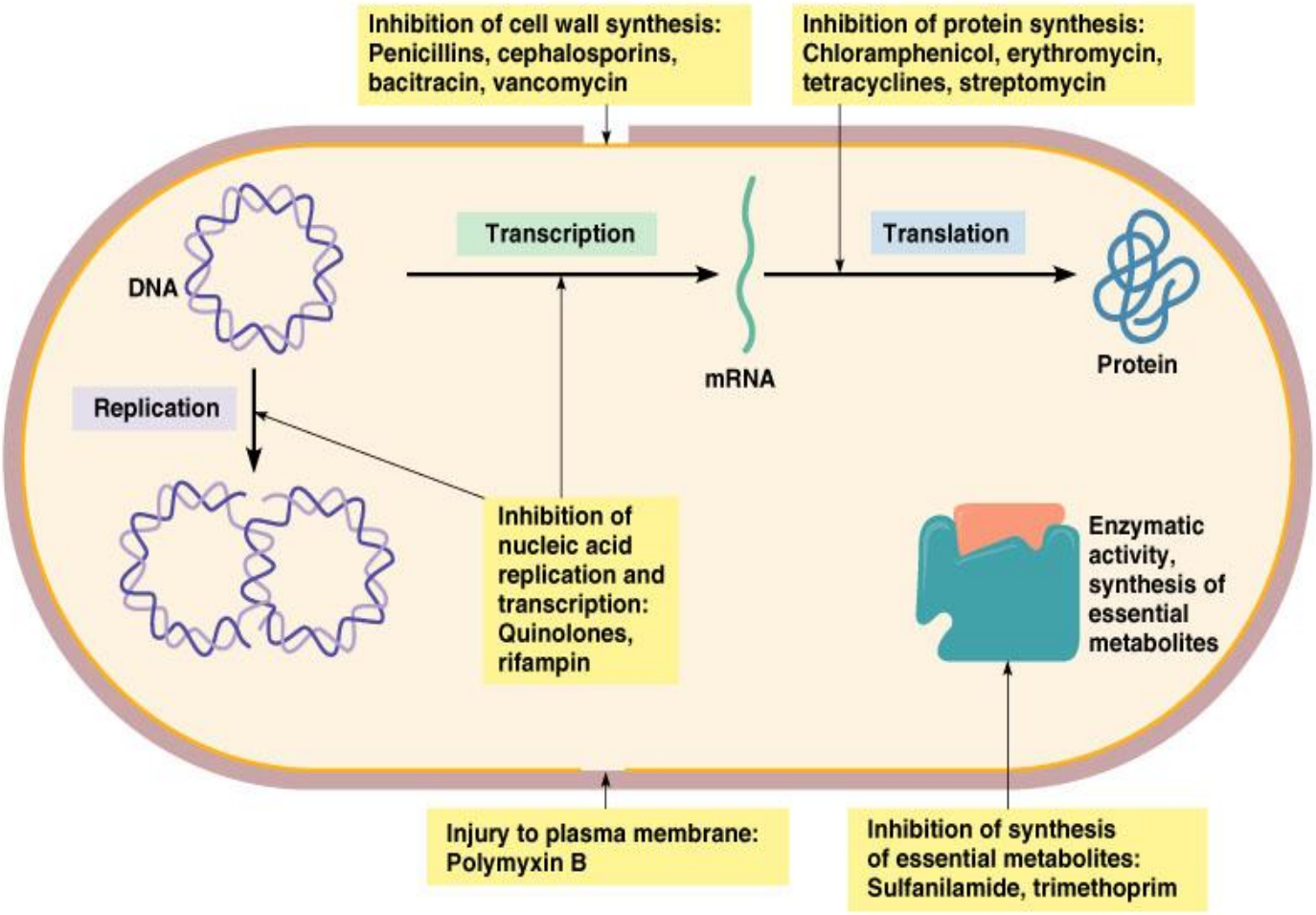
1. Beta-lactam antibiotics:- Penicillin, Cephalosporin, Monobactums, Carbapenem
2. Tetracyclins:- Oxytetracycline, Doxycycline
3. Nitrobenzene derivatives:- Chloramphenicol
4. Aminoglycosides:- Streptomycin, Gentamicin, Neomycin
5. Macrolide antibiotic:- Erythromycin, Roxithromycin, Azithromycin
6. Polypeptide antibiotics:- Polymycin-B, Colistin, Tyrothricin
7. Oxazolidinone:- Linezolid
8. Nitrofuran derivatives:- Nitrofurantoin, Furazolidone
9. Glycopeptides:- Vancomycin, Teicoplanin
10. Nitroimidazoles:- Metronidazole, Tinidazole
11. Polyene antibiotics:- Nystatin, Amphotericin, Hamycin
12. Nicotinic acid Derivatives:- Isoniazid, Pyrazinamide, Ethionamide
13. Azole derivatives:- Miconazole, Clotrimazole, Ketoconazole, Fluconazole
14. Others:- Rifampin, Linomycin, Clindamycin, Streptomycin, Cycloserine, Vincomycin, Ethambutol, Thiacetazone, Clofazimine, Griseofulvin

Antibiotic Function

There are various ways in which antibiotics exert their antimicrobial activity. An antibiotic can be bactericidal, killing microorganisms directly, or bacteriostatic, inhibiting growth of microorganisms.

Five modes of bacteriostasis:

- Inhibition of Cell Wall Synthesis
- Inhibition of Protein Synthesis
- Injury to Plasma Membrane
- Inhibition of Nucleic Acid Synthesis
- Inhibition of Synthesis of Essential Metabolites



Five modes of bacteriostasis

Figure: - 1

Regulation and Control

Antibiotic control and regulation as manifested in antibiotic resistance.

Antibiotic Resistance

Almost all bacteria that was once susceptible to antibiotics are resistant to at least one, if not more antibiotics today. Thought to be miracle drugs when discovered in the earlier part of this century, antibiotics cured many previously fatal infections. We learned how to mass produce these substances in labs, and drug therapy was status quo for treating microbial diseases. However, an over- reliance on these miracle agents soon developed, and we began to treat symptoms normally handled by our body's own immune system with antibiotic drugs. The consequence to this reliance on antibiotic therapy was that bacteria developed ways to resist them. After steady use over long periods of time, bacteria no longer killed or harmed by the drugs were selected for. These strains reproduced and their offspring were also resistant, capable of causing infections not cured by antibiotic drugs.

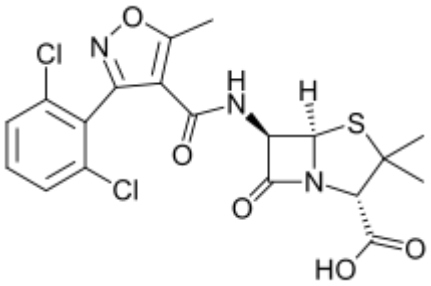
Mechanisms of Drug Resistance

- Inherent Resistance
- Inactivation of Drugs
- Alteration of Antibiotic Target
- Mutations

Transmissions of Drug Resistance

- Bacterial Plasmids
- Transposons
- Bacteriophages

❑ Dicloxacillin

Dicloxacillin	IUPAC Name
 Figure: - 2	**(2S,5R,6R)-6-{[3-(2,6-dichlorophenyl)-5-methyl-oxazole-4-carbonyl]amino}-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid** **Formula - $C_{19}H_{17}Cl_2N_3O_5S$**

Dicloxacillin is a narrow-spectrum beta-lactam antibiotic of the penicillin class. It is used to treat infections caused by susceptible Gram-positive bacteria. It is active against beta-lactamase-producing organisms such as Staphylococcus aureus, which would otherwise be resistant to most penicillins. It is very similar to flucloxacillin and these two agents are considered interchangeable.

Mode of action

Like Beta-lactam antibiotic, dicloxacillin acts by inhibiting the synthesis of bacterial cell walls. It inhibits cross-linkage between the linear peptidoglycanpolymer chains that make up a major component of the cell wall of Gram-positive bacteria.

Pharmacodynamics:

Penicillins produce time-dependent killing

Pharmacokinetics:

Cmax: 10-17mcg/ml

Oral bioavailability: 37%

Half- life: 0.8 hours;

Medicinal chemistry

Dicloxacillin is insensitive to beta-lactamase (also known as penicillinase) enzymes secreted by many penicillin-resistant bacteria. The presence of theisoxazolyl group on the side-chain of the penicillin nucleus facilitates the β-lactamase resistance, since they are relatively intolerant of side-chain steric hindrance. Thus,

it is able to bind to penicillin-binding proteins (PBPs) and inhibit peptidoglycan cross linking, but is not bound by or inactivated by β-lactamases.

Clinical use

Dicloxacillin is more acid-stable than many other penicillins and can be given orally, in addition to parenteral routes. However, like methicillin, it is less potent than benzylpenicillin against non-β-lactamase-producing Gram-positive bacteria.

Dicloxacillin has similar pharmacokinetics, antibacterial activity, and indications to flucloxacillin, and the two agents are considered interchangeable. It is believed to have lower incidence of severe hepatic adverse effects than flucloxacillin, but a higher incidence of renal adverse effects.

Available forms

Dicloxacillin is commercially available as the sodium salt Dicloxacillin sodium in capsules (250 or 500 mg) and injections (powder for reconstitution, 500 and 1000 mg per vial).

Indications

Dicloxacillin is indicated for the treatment of infections caused by susceptible bacteria. Specific approved indications include

- Staphylococcal skin infections and cellulitis including impetigo, otitisexterna, folliculitis, boils, carbuncles, and mastitis
- Pneumonia (adjunct)
- Osteomyelitis, septic arthritis, throat infections, streptococcus
- Septicaemia
- Empirical treatment for endocarditis
- Surgical prophylaxis

Precautions/contraindications

Dicloxacillin is contraindicated in those with a previous history of allergy to penicillins, cephalosporins or carbapenems. It should also not be used in the eye, or those with a history of cholestatic hepatitis associated with the use of dicloxacillin or flucloxacillin.

It should be used with caution in the elderly; patients with renal impairment, where a reduced dose is required; and those with hepatic impairment, due to the risk of cholestatic hepatitis.

Adverse effects

Common adverse drug reactions (ADRs) associated with the use of dicloxacillin include: diarrhoea, nausea, rash, urticaria, pain and inflammation at injection site, superinfection (including candidiasis),allergy, and transient increases in liver enzymes and bilirubin.

On rare occasions, cholestatic jaundice (also referred to as cholestatic hepatitis) has been associated with dicloxacillin therapy. The reaction may occur up to several weeks after treatment has stopped, and takes weeks to resolve. The estimated incidence is 1 in 15,000 exposures, and is more frequent in people >55 years, females, and those with treatment longer than 2 weeks.

Drug Interactions:

Dicloxacillin is an inducer of the cytochrome P450 3A4 isoenzyme. Caution should be exercised and monitoring is suggested when concomitantly administering dicloxacillin with drugs that have narrow therapeutic windows and are substrates of the CYP3A4 enzyme.

Contraceptives - decreased contraceptive effectiveness

Live Typhoid Vaccine - decreased immunological response to the typhoid vaccine

Probenecid - increased dicloxacillin levels

Warfarin - decreased anticoagulant effectiveness

Pregnancy:

Category B: No evidence of risk in humans but studies inadequate.

Monitoring Requirements:

Therapeutic: Culture and sensitivities, signs and symptoms of infection

Toxic: Periodic CBC, urinalysis, BUN, Creatinine, AST and ALT

Resistance

Despite dicloxacillin being insensitive to beta-lactamases, some organisms have developed resistance to it and other narrow-spectrum β-lactam antibiotics including methicillin. Such organisms include methicillin-resistant Staphylococcus aureus.

COMBINATION THERAPY

Combination therapy or polytherapy is the use of more than one medication or other therapy. In contrast, monotherapy is any therapy which is taken by it.

Most often, these terms refer to the simultaneous administration of two or more medications to treat a single disease. However, the expression is also used when other types of therapy are used at the same time, such as the combination of medications and talk therapy to treat depression.

Combination therapy may be achieved by giving separate drugs, or, where available, by giving combination drugs, which are dosage forms that contain more than one active ingredient.

Polypharmacy is the use of multiple medications to treat multiple, separate diseases.

Uses for combination therapy

Conditions treated with combination therapy include tuberculosis, leprosy, cancer, malaria, and HIV/AIDS. One major benefit of combination therapies is that they reduce development of drug resistance, since a pathogen or tumor is less likely to have resistance to multiple drugs simultaneously. Artemisinin-based monotherapies for malaria are explicitly discouraged to avoid the problem of developing resistance to the newer treatment.

Combination therapy may seem costlier than monotherapy in the short term, but when used appropriately, it causes significant savings: lower treatment failure rate, lower case-fatality ratios, slower development of resistance and consequently, less money needed for the development of new drugs.

Uses for monotherapy

Monotherapy can be applied to any therapeutic approach, but it is most commonly used to describe the use of a single medication. Normally, monotherapy is selected because a single medication is adequate to treat the medical condition. However, monotherapies may also be used because of unwanted side effects or dangerous drug interactions.

❑ DICLOXACILLIN COMBINATIONS:-

Brand Name	Combination	Manufacturers	Type
AMPILOX-LB	Ampicillin 250 mg, dicloxacillin 250 mg, lactobacillus sporogenes 60 million.	Biochem	Capsule
AMPOXIN-LB	Ampicillin 250 mg, dicloxacillin 250 mg, lactobacillus 60 million cells	Unichem	Capsule
AMPOXIN	Ampicillin 250 mg, dicloxacillin 250 mg	Unichem	Capsule
AMPOXIN PLUS	Amoxicillin 250 mg, dicloxacillin 250 mg	Unichem	Capsule
MEGAPEN	Ampicillin 250 mg, dicloxacillin 250 mg	Aristo	Capsule
NOVACLOX-LB	Amoxicillin 250 mg, dicloxacillin 250 mg, lactobacillus sporogenes 80 million	Cipla	Capsule
SUPRIMOX	Ampicillin 250 mg, dicloxacillin 250 mg	Ranbaxy	Capsule
MOXIKIND-PLUS	Ampicillin 250 mg, dicloxacillin 250 mg	Mankind	Capsule
MODCEF-D	Dicloxacillin (SR) 500 mg, Anhydrous cefixime 200 mg	Abbott	Tablet
MILIXIM-DLX	Cefixime 200 mg, dicloxacillin (CR) 500 mg, lactobacillus 90 million cells.	Glenmark	Tablet
UNITO	Cefpodoxime 200 mg, dicloxacillin 500 mg	Wanbury	Tablet
ZEDOCEF-DXL	Cefpodoxime proxetil 200 mg, dicloxacillin 500 mg	Macleods	Tablet

Table No: - 1

OBJECTIVES

OBJECTIVE

The objectives are to,

- Explore the market scenario of the selected combination.
- Ascertain the availability and sales of Dicloxacillin combination.
- Know the dose and duration of Dicloxacillin combination.
- Know Prescription writing behaviour of Doctors.

RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

Sample Area: - The interviews were conducted in, S.M.S hospital, Apex Hospital, Fortis Hospital, SDMH Hospital, Jaipuria Hospital, Narayana Hrudayalaya Hospital, Bhundari Hospital & Research Centre, and Government Hospital Dausa.

Type of data collected: - Primary Data

Primary data generally means those raw data or data structures that are collected "first hand" and have not had any previous meaningful interpretation. For my summer internship project report, I have collected such primary data through observation method and through interviews with Surgeons, ENT, Gynaecologists, Physicians and Paediatrician in Jaipur and Dausa (Rajasthan).

Sample Size: - The total sample size was 90. In that there are 40 chemist shop and 50 doctors (10 Surgeons, 10 ENT surgeons, 10 Gynaecologists, 10 Physicians and 10 Paediatrician) will be surveyed. While taking sample I took a point into a consideration to obtain a sample in such a way that it will represent the entire population.

Tools (questionnaire):- A structured questionnaire was prepared which contain both close ended and open ended questions on the basis of which detailed information was obtained from doctors and chemist.

This questionnaire includes which brand is mostly preferred, why these brands are preferred, rational behind using these brands and roles of these brands.

After having information on the basis of these questionnaires it was easier to make a conclusion.

Methodology: - A structured questionnaire for the study of perception of Surgeons, ENT, Gynaecologists, Physicians, Paediatrician and chemist regarding survey of combinations of Dicloxacillin with Amoxicillin, Cefixime, Ampicillin, Cefpodoxime according to data required.

Doctors were surveyed on the basis of designed questionnaire during field visit in jaipur and dausa.

Visited 10 Surgeons, 10 ENT surgeons, 10 Gynaecologists, 10 Physicians and 10 Paediatrician and 40 chemist shops in Jaipur and dausa.

Type of Research: - In depth interview

Met all the Surgeons, ENT surgeons, Gynaecologists, Physicians, Paediatrician and Chemist and discussed about the questionnaire and market shares of Dicloxacillin combinations.

The aim for this approach is to ensure that each interview presented with exactly the same question in same order. This ensures that answer can be reliable and aggregated that comparison can be made with confidence between different survey periods.

Sampling Characteristics:-

Target Population- The target population for the research are all Surgeons, ENT surgeons, Gynaecologists, Physicians, Paediatrician and chemists of Jaipur and Dausa (Rajasthan).

Sampling Techniques: - Sampling technique used here is simple random sampling. I have visited different government hospital, private hospital in Jaipur and dausa. The instrument which was used to gather the required information was a questionnaire. Few questions in the questionnaire were close ended and few were open ended. All the questions were framed in a way to be filled in the minimum time and to acquire maximum possible information from doctor and chemist about the perception for the combinations of Dicloxacillin with Amoxicillin, Cefixime, Ampicillin, Cefpodoxime.

COMPANY PROFILE

COMPANY PROFILE

About Organization:-

Abbott, is a company that focuses on turning science into caring – ABBOTT, A Promise for Life. For more than a century, Abbott Laboratories has been working to advance health care for people around the world. Founded in 1888 by a young Chicago physician, Dr Wallace Calvin Abbott, Abbott Laboratories has evolved into a diversified health care company that discovers, develops, manufactures and markets innovative products and services. Products and services of Abbott span the continuum of care from prevention and diagnosis, to treatment and cure. Abbott today is a global, diversified health care company devoted to the discovery, development, manufacture and marketing of pharmaceutical, diagnostic, nutritional and hospital products. The company now employs approximately 65,000 people and markets its products in 130 countries worldwide.

Abbott extends this commitment with a strong presence in India as it has grown and evolved its operations in India over many decades. Our products encircle life from newborns to ageing adults. Abbott has built expertise and leadership in primary care therapeutic areas like Gastroenterology and Paincare. Our specialty areas include Neuroscience, Metabolics and Hospital Care.

Abbott serves the needs of Indian consumers with products backed by science and R&D. We have locally developed brands like Digene, Cremaffin, Epilex, Zolfresh and Obimet. Abbott has also brought global products including Brufen, Prothiaden, Ganaton, Sevorane, Thyronorm and Leptos to Indian consumers. Abbott's pioneering products like Survanta help infants.

Abbott India today has strong brand equity and commands esteem in the market place. To reach the customer, Abbott India has a network of 18 distribution points, which cater to 11,000 stockists and 70,000 retailers. Behind Abbott India's success, is a team of competent, committed people, driven by the principles of Value Based Management, and aided by strong alliances and partnerships.

Abbott India Limited provides healthcare solutions through its four business units:

1. Primary Care - which markets products in the areas of Pain Management, Gastroenterology, with well-known brands like Brufen, Digene, Cremaffin.
2. Specialty Care – Metaboloics & Urology provides solutions in the areas of Thyroid, Obesity, Diabetes and Benign Prostratic Hyperplasia.
3. Specialty Care - Neuroscience has a varied portfolio, with specialty products in the Neurology and Psychiatric segments.
4. Hospital Care - Offers products in the field of anesthesiology and neonatology namely Forane, Sevorane and Survanta.

The company has over 1000 employees and a state-of-the-art formulation plant at Verna in Goa. The manufacturing locations are designed to produce quality, high volume formulations using cost efficient processes. The plant has well equipped laboratories and trained personnel to ensure international standards of quality at each step of the manufacturing process.

The company has in-house development and medical teams to undertake product and clinical development tailored to the needs of the Indian market.

Abbott provides quality health care worldwide by creating healthcare solutions, which directly affects the life of the common man.

Vision

To be the world's premier health care company

Dedication

To employees, customers, shareholders, suppliers and the public

Strategy

Value Based Management is our integral philosophy, directed towards maximizing long-term cash flow and shareholder value through:

- Focus on the Company's core profitable segments to build up our position as one of the leading pharmaceutical companies;
- Investments in information technology to improve planning and control of operation;
- Increased investments in Human Resources Training & Development to upgrade and broaden the skill base of the organization in consonance with changing needs;
- Build flexible cost-efficient manufacturing base through a balanced mix of in-house and contract manufacturing

Work Culture

Abbott India is an equal opportunity employer and provides a congenial and professional work environment for all its employees, with great emphasis on teamwork. We stimulate innovation, encourage calculated risk taking and accept mistakes as a part of the learning process.

We encourage experiential learning, and believe in clear delegation of authority and acceptance of personal accountability. We value the involvement of our colleagues in bringing the best to our organization in a spirit of understanding, trust and appreciation of cultural differences. We are open to discussing alternative views and build on constructive feedback.

Basic Principle

Respect people: Our people are our strength.

- **The Abbott Brand Promise**

A Promise for Life

Turning Science into Caring

We are here for the people we serve in their pursuit of healthy lives. This has been the way of Abbott for more than a century – passionately and thoughtfully translating science into lasting contributions to health.

Our products encircle life, from newborns to aging adults, from nutrition and diagnostics through medical care and pharmaceutical therapy.

Caring is central to the work we do and defines our responsibility to those we serve:

We advance leading-edge science and technologies that hold the potential for significant improvements to health and to the practice of health care.

We value our diversity – that of our products, technologies, markets and people – and believe that diverse perspectives combined with shared goals inspire new ideas and better ways of addressing changing health needs.

We focus on exceptional performance – a hallmark of Abbott people worldwide – demanding of ourselves and each other because our work impacts people's lives.

We strive to earn the trust of those we serve by committing to the highest standards of quality, excellence in personal relationships, and behavior characterized by honesty, fairness and integrity.

We sustain success – for our business and the people we serve – by staying true to key tenets upon which our company was founded over a century ago: innovative care and a desire to make a meaningful difference in all that we do. The promise of our company is in the promise that our work holds for health and life.

SWOT Analysis

STRENGTH

1. **Global Presence**

   - Distributes pharmaceutical, nutritional, diagnostic and medical products in more than 130 countries
   - More than half of sales come from global markets

- Global "Turning Science into Caring" program
- Invested $580 million in 2009
- Capacity building partnerships, product donations, patient assistance programs

Net Sales by Country

Figure No: - 3

2. **Innovation Leader in Industry**

- Focus current health care concerns in low income areas of foreign nations.
- Diverse product pipeline to minimize risk and pursue new discoveries.
- Current Innovation Pipeline: -
  - One of the world's first bioresorbable stents.
  - Series of molecular diagnostic tools to detect new and emerging diseases.
  - Biomarkers for use in detecting difficult-to-diagnose diseases.
  - Specially formulated therapeutic nutritionals to reduce muscle loss and build up new tissue.

3. **Over 100 Years Success And Experience**

- 345 consecutive quarterly dividends to shareholders since 1924
- Generated shareholder return 20% over past 3 years
  - Compared to 16% decline of Standard & Poors Index
- Regarded as a leading global employer

- Company has received numerous local, national and international accolades for commitment to workplace excellence

4. **Environmental Management & Image**

- 2015 Sustainability Goals
  - Reduce CO2 emissions by 15%
  - Reduce total water intake by 50%
  - Reduce total waste by 50%
- Voluntary members of EPA "Climate Leaders Program"
  - Work with EPA and other companies to develop long term climate change strategies
- Comprehensive Water Strategy
  - Water audit assessments of local communities
  - Use World Business Council for Sustainable Development's "Global Water Tool" at 48 major manufacturing plants around the world to assess their local water needs

5. **Diverse Product Line**

- Offer
  - Specialized medicines
  - Medical diagnostic instruments and tests
  - Minimally invasive surgical devices
  - Nutritional supplements for infants, children and adults
  - Veterinary care products
- Thousands of products and patents worldwide
- Four main product lines:
  - Pharmaceutical
  - Diagnostic
  - Nutritional
  - Vascular

6. Nutritional Products

- Global sales in 2009 were $5.3 billion
  - Sales outside the U.S. grew more than 17% in 2009
- Some of world's most trusted brands
  - Similac, PediaSure, Ensure, EAS, NutriPals, Pedialyte, and Zone Perfect

- Provide specially formulated medical nutritional products to patients with unique dietary needs due to injury or illness
- Global Nutrition Industry forecasted to have continuous growth

Figure No: - 4

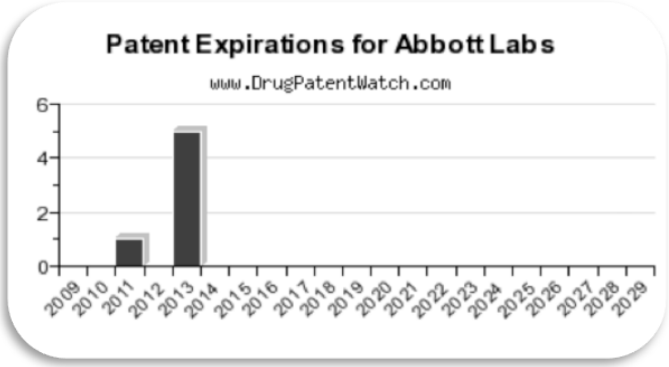
7. Supply Chain Management

- Financial risk screening process for potential suppliers
- Over 1,000 on site audits of suppliers in last two years
- Evaluates performance and commitment to social responsibility
- Extensive global supply chain helps mitigate shortages
- $14B spent on goods and services amongst 20,000 suppliers in 2009

WEAKNESS

1. Upcoming Expiring Patent

- The most threatened to expire are:
  - Biaxin (expired in 2005): this antibiotic has already experienced a 33% sales decrease since losing its patent
  - Depakote (expired January 2008): this prescription drug treats migraines, bipolar disorder, and epilepsy is Abbott's second best selling pharmaceutical product
- Half of company's revenue



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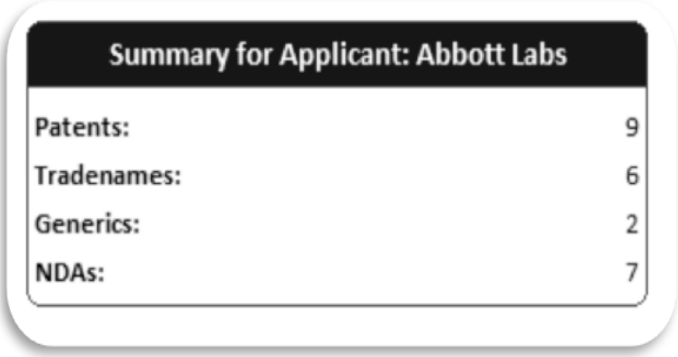

Figure No: - 6

2. High Research Costs

- Majority of R&D expenditures on pharmaceuticals
  - 1 in 1,000 pharmaceutical compounds progresses from the laboratory into clinical trials
  - 1 in 12 compounds entering clinical trials will reach patients
- New R&D facilities opened in Singapore and China in 2009
- Invested more than $3.7B in 2010 on many key programs

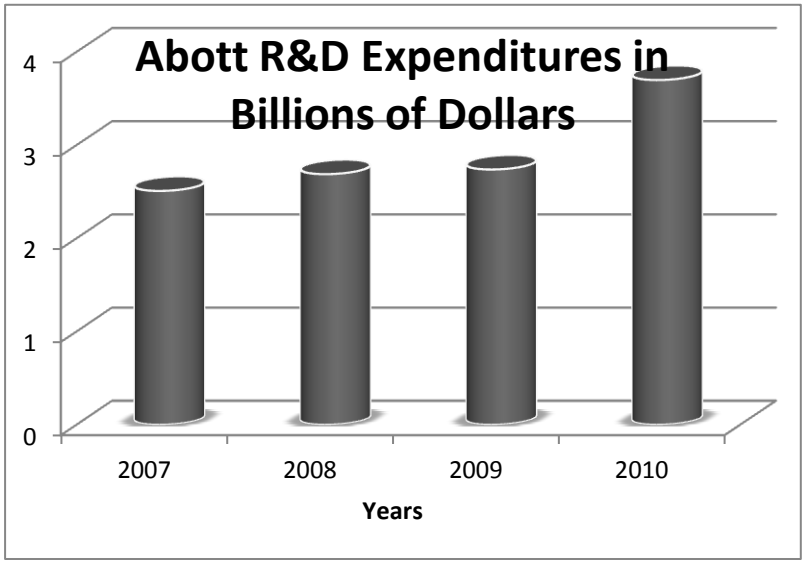

Figure No: - 7

3. Recent Company Layoffs

- Layoffs more prevalent throughout pharmaceutical industry
- 3,000 or 3.2% of work force laid off in Sept. 2010
- 1,900 laid off in Jan. 2011
- 5.4% of total work force laid off in last 6 months
- CEO blames Obamacare plan

4. **Declining Market Share**

- Currently 6th largest pharmaceutical company

- $72.47B market cap

➢ Worldwide growth restricted to single digits

➢ Industry challenges

- Sluggish prescription trends
- EU pricing pressure
- Intensifying generic competition
- Pipe line failures

5. **Limited Investor Confidence**

➢ Current recession fosters uncertainty

➢ Quarterly earnings growth -6.4% as of 4th qtr 2010

➢ Stock fell 10.8% in 2010

6. **Product Callbacks**

Similac Powder Infant Formulas

➢ Product lines offered in plastic containers

- 8 oz, 12.4 oz and 12.9 oz cans

➢ Removed from U.S., Puerto Rico, Guam and some Caribbean countries

➢ Did not meet Food and Drug Administration (FDA) standards

➢ Infants could experience symptoms of gastrointestinal discomfort and refusal to eat

OPPORTUNITY

1. **Product Innovation**

➢ Promote Diet-Aid Reductil

- Treats obesity by suppressing appetite
- 34% of American adults age 20 and over are obese

➢ Capitalize Innovative Ensure® Product Line

- Introduce Ensure® products aiding
  - Bone
  - Immune system
  - Muscle
  - Protein

- More Americans concerned about healthy lifestyle and nutrition
  - 70% would not want their kids to adopt their eating habits

2. Seize Large Stent (DES) Market Share

- DES market is estimated to be only 30% to 35% penetrated
- 10% to 15% annual growth estimate rate for vascular closure device market
- Gain competitive advantage by promoting and approving Xience V before its competitors
- Currently Boston Scientific's Taxus and Johnson & Johnson's Cypher control 90% of the market

3. Fabotherapics Joint Venture To Expand Profits

- Joint Venture With Instituto Bioclon
  - Exclusive distributorship by Fuerza Especial Silanes (FES) results in easier access to marketing channels
  - Regionalization provides fabotherapics products to Central and South America, United States, Australia, Europe, Africa, and the Middle East
  - Provide fabotherapics products to hospitals and zoos
- Produce Antivemon To Treat Illnesses
  - Snake venom utilized during heart surgery
  - Bee venom treats arthritis, pain, and rheumatoid diseases
  - Deathstalker scorpion venom aids in treatment of brain cancer
  - Tarantula venom treats muscular dystrophy
- Base Antivenin Production According To Demand
  - Result to more cost-effective and profitable than its competitors in this sector

THREAT

1. Government Intervention-

- Restrictive Government Legislation
  - Senate exploring new ways to lower drug prices
  - Courts' interpretation of intellectual property rights impacts domestic markets to foreign competition
- Restrains On Medicare Reform

- Affects drug choices of about 20% of the US population
- Medication coverage extends may force to lower drug prices
- Decrease overall profits in pharmaceutical industry

➢ Prescription Drug Fairness for Seniors Act Pricing Influx

- Affects 39 million seniors and people with disabilities on Medicare
- Give local pharmacies the "best" price for Medicare beneficiaries as their regular customer base

2. **Aggressive Competition From Generics**

➢ Prices up to 80% less than brand names

➢ 70% of prescriptions are for generic drugs

➢ 2015 estimates show $200B worth of branded drug sales may be lost to generic competition

➢ Lowers Abbott's market share and sales from direct competition

➢ HIV patent lopinavir/ritonavir rejected

- Indian patent office rejected the patent application of HIV lopinavir/ritonavir

➢ Litigation case against Ranbaxy Laboratories

- Ranbaxy able to sell cholesterol medication in India

➢ **$22.5 million TriCor U.S. settlement lawsuit**

- Settlement involves the 145 milligram dose of TriCor
- Case settled in New York, 22 other states and District of Columbia
- Licensing agreement with Teva Pharmaceutical Industries Ltd to produce generic version of Tricor no sooner than March 28, 2011

3. Large Pharmaceutical Industry M&A: Consolidation and Diversification Camps

➢ Consolidation Camps acquire firms in same industry

➢ After 1-4 years, company values as measured by stock market capitalization

➢ Pfizer (PFE) the largest in this category

➢ Nearly $200B to acquire Warner Lambert and Pharmacia and smaller pharmaceuticals

➢ Stock market cap for company reached under $100 billion despite loads of restructuring, re-engineering and synergy targets

➢ Diversification Campers well-rounded portfolio

➢ Significant growth in consumer healthcare, medical devices and diagnostics

➢ Leverage existing franchises and/or management and infrastructure

➢ Largest competitor Johnson & Johnson (JNJ) acquired Pfizer's Consumer Healthcare Businesses and numerous biotechnology companies for over $16 billion

4. **Technological and Institutional Changes To Value Chain**

- "Molecular biology revolution"
  - Transformed drug discovery processes
  - Advances in genetics and molecular biology enhanced the discovery of "small molecule" synthetic chemical drugs
  - Genetic engineering's technology processes development of therapeutic agents
- Mobilized specialized biotechnology firms (NBFs) research
  - Create commercially useful techniques and products
  - Broader projects and portfolios of projects in pharmaceuticals (i.e. diagnostics and therapeutics)
- Development of generic research technologies
  - PCR, protein structure modelling, rapid computer based drug assay and testing, recombinant chemistry techniques, drug delivery systems chemical separation and purification techniques
- Search and testing phases of pharmaceutical research and development
  - Higher breadth of applications, in terms of the number of disease areas and biological targets

DATA ANALYSIS & INTERPRETATION

DATA ANALYSIS & INTERPRETATION

1. Approximately Patients examine by you per week?

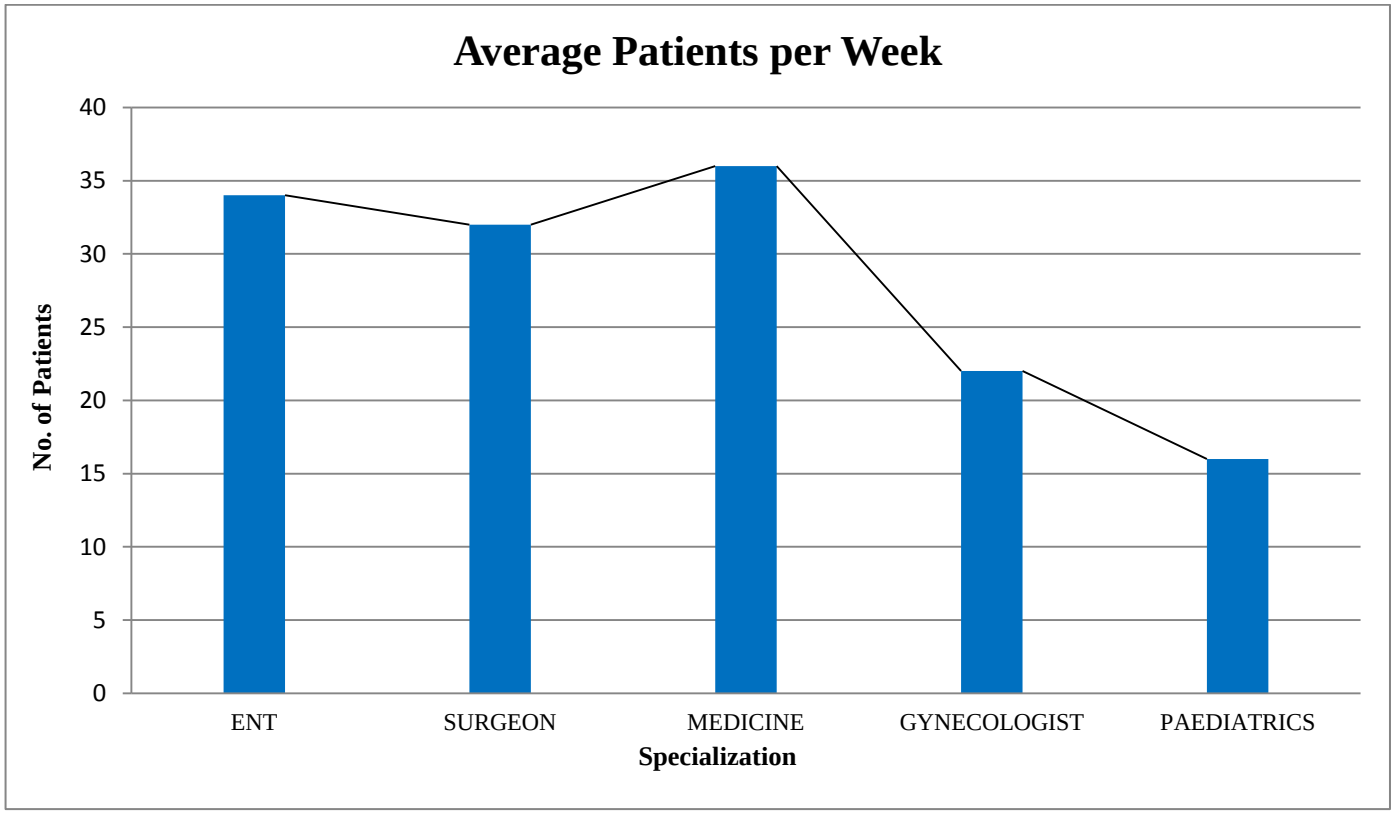

Figure No: - 8

Specialization	No. Of Doctors	Avg. Patients (per week)
ENT	10	34
SURGEON	10	32
MEDICINE	10	36
GYNECOLOGIST	10	22
PAEDIATRICS	10	16

Table No: - 2

Interpretation:-

- The average no. Of patient for Medicine are 36, which is highest from other faculty of doctors.
- Medicine, Surgeon and ENT in these faculty average no. Of patient are near to the equal.
- The average no. Of patient for Paediatric are 16, which is lowest from other faculty of doctors

2. Which antibiotic combination of Dicloxacillin you prefer the most?

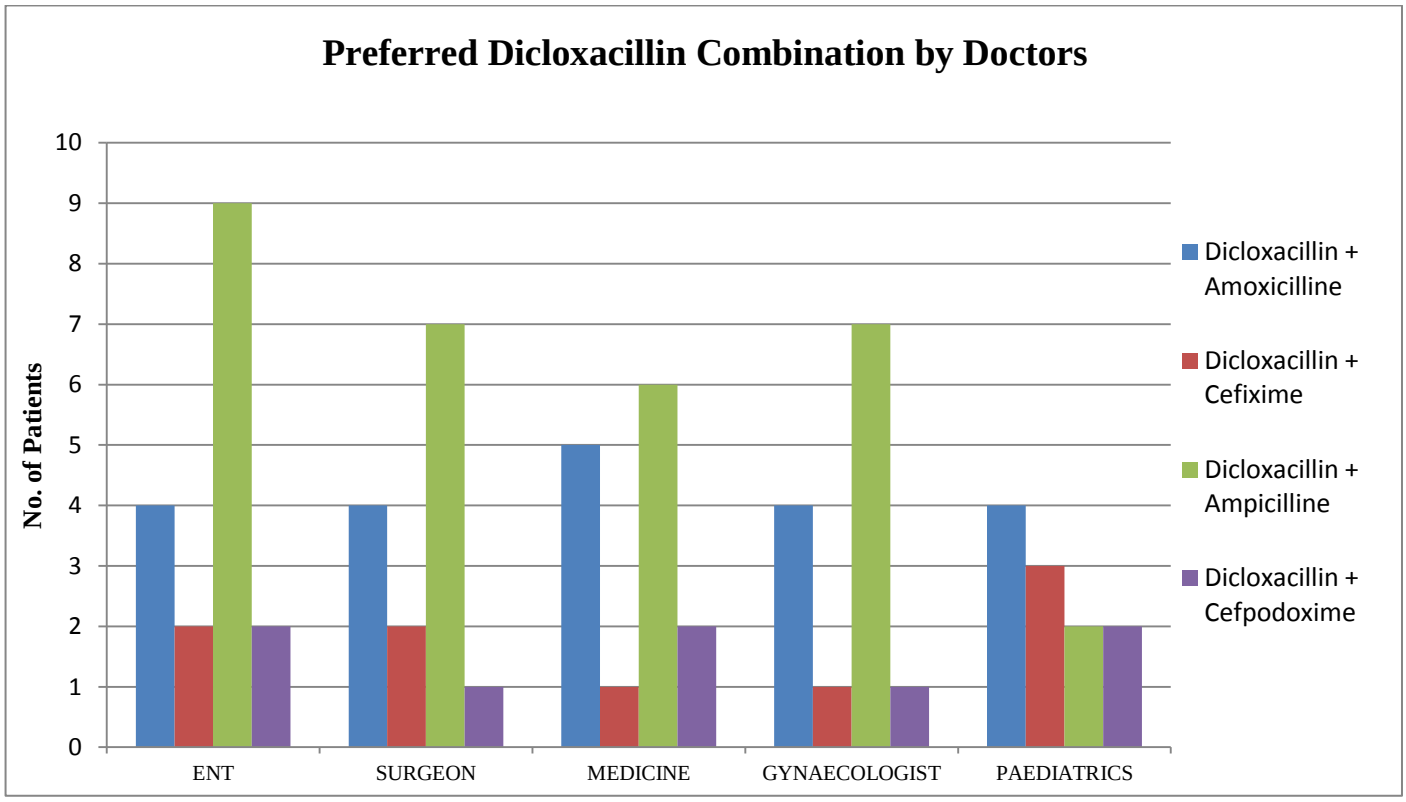

Figure No: - 9

Specialization	Dicloxacillin+ Amoxicilline	Dicloxacillin+ Cefixime	Dicloxacillin+ Ampicilline	Dicloxacillin+ Cefpodoxime
ENT	4	2	9	2
SURGEON	4	2	7	1
MEDICINE	5	1	6	2
GYNAECOLOGIST	4	1	7	1
PAEDIATRICS	4	3	2	2

Table No: - 3

Interpretation:-

- The combination of Dicloxacillin + Ampicilline 1st preferred molecule by ENT, Surgeon, Medicine and Gynaecologist but not by Paediatrics.
- The combination of Dicloxacillin + Amoxicilline is 2nd preferred molecule by ENT, Surgeon, Medicine and Gynaecologist but 1st by Paediatrics.
- Dicloxacillin + Cefixime and Dicloxacillin + Cefpodoxime are least preferred molecule by all faculties of Doctors.

3. Which Brand you prefer for the above combination?

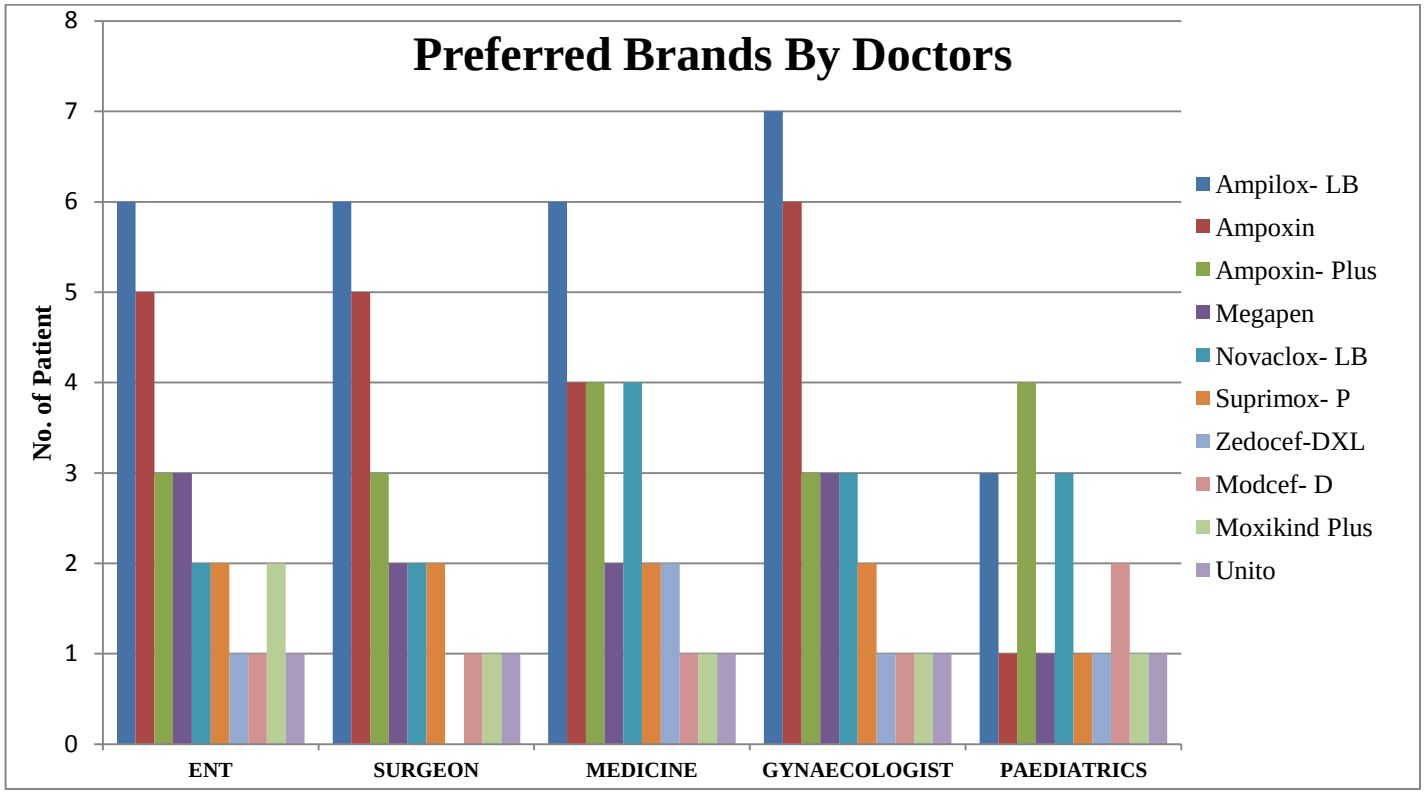

Figure No: - 10

Specialization	Ampilox-LB	Ampoxin	Ampoxin-Plus	Megapen	Novaclox-LB	Suprimox-P	Zedocef-DXL	Modcef-D	Moxikind Plus	Unito
ENT	6	5	3	3	2	2	1	1	2	1
SURGEON	6	5	3	2	2	2	0	1	1	1
MEDICINE	6	4	4	2	4	2	2	1	1	1
GYNAECOLOGIST	7	6	3	3	3	2	1	1	1	1
PAEDIATRICS	3	1	4	1	3	1	1	2	1	1

Table No: - 4

Interpretation:-

- Among all the brands Ampilox-LB is 1st preferred brand by ENT, Surgeon, Medicine and Gynaecologist but not by Paediatrics.
- Ampoxin is the 2nd preferred brand among all brands by ENT, Surgeon, Medicine and Gynaecologist but not by Paediatrics.
- In Paediatrics the most 1st preferred brand is Ampoxin-Plus and both Ampilox-LB and Novaclox-LB are 2nd preferred brands.

4. Does the price of the product matters to you while prescribing the product?

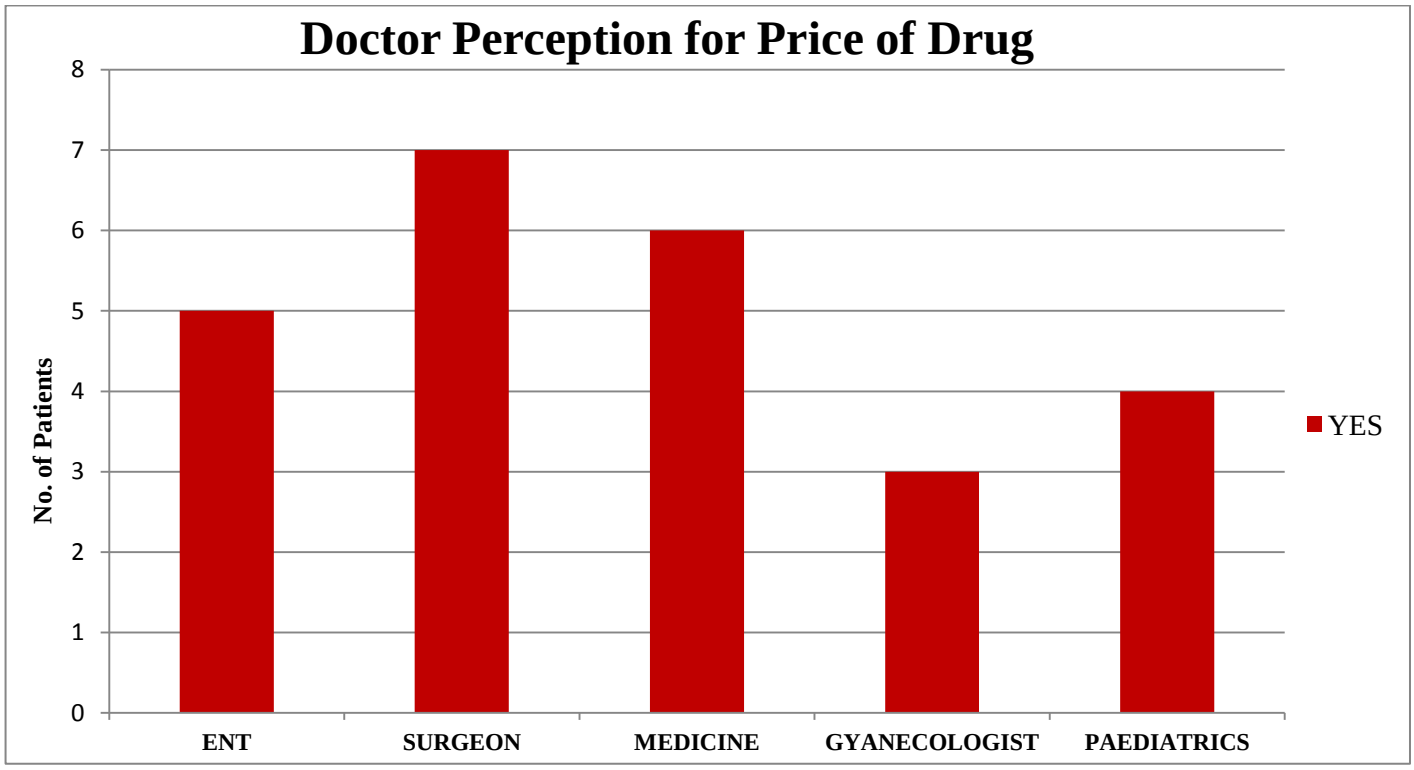

Figure No: - 11

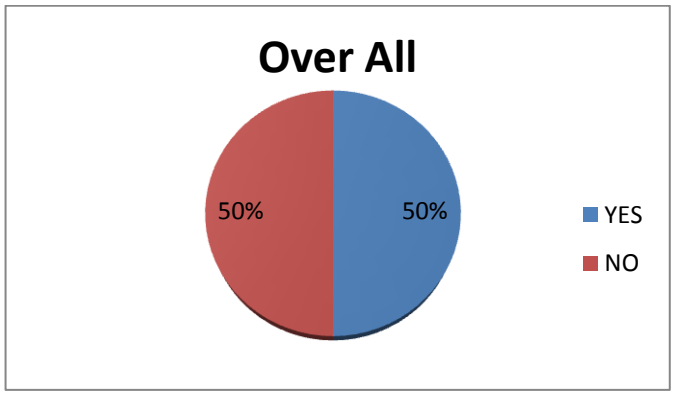

Figure No: - 12

SPECIALIZATION	YES	NO
ENT	5	5
SURGEON	7	3
MEDICINE	6	4
GYANECOLOGIST	3	7
PAEDIATRICS	4	6
	25	25

Table No: - 5

Interpretation:-

- From all faculties Surgeon are the one, for them pricing of the product matters before they prescribe any product.
- From all faculties Gynaecologist are the one, for them pricing of the product don't matters before they prescribe any product.
- From the cumulative graph we know that there is a ratio of 50% / 50%. So for half of the Doctors pricing of the product matters and for other half it doesn't matter.

5. Approximately what percentage of the patient you prescribe Dicloxacillin combination?

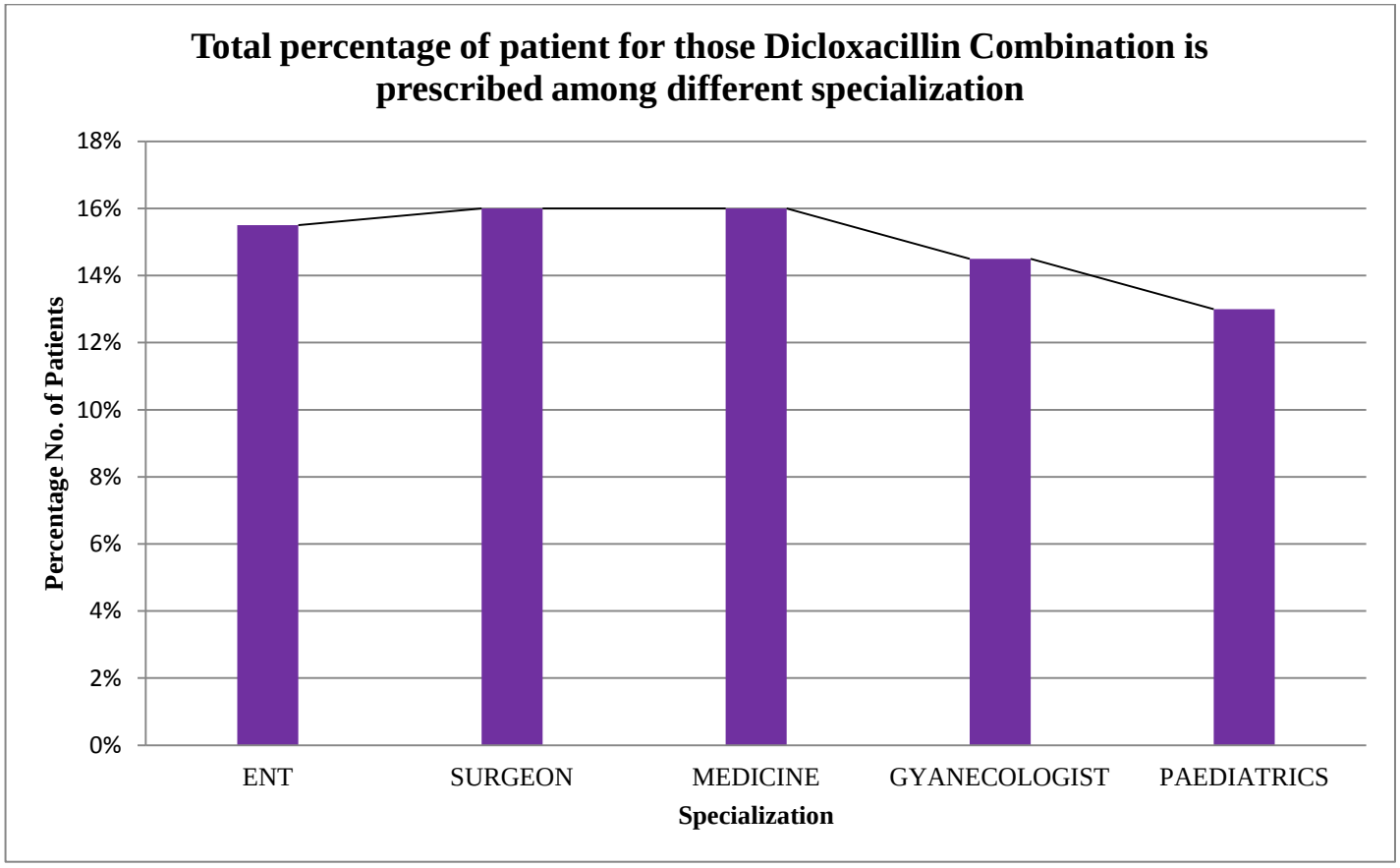

Figure No: - 13

Interpretation:-

- Surgeons and Medicine Doctors are on top 1st position, to prescribe Dicloxacillin Combination to their 16% of patients.
- ENT and Gynaecologists are on 2nd and 3rd position, to prescribe Dicloxacillin Combination.
- Paediatrics is at last 4th position, to prescribe Dicloxacillin Combination to their 13% of patients.

Chemist Data:-

1. Brands of this combination mentioned in prescription?

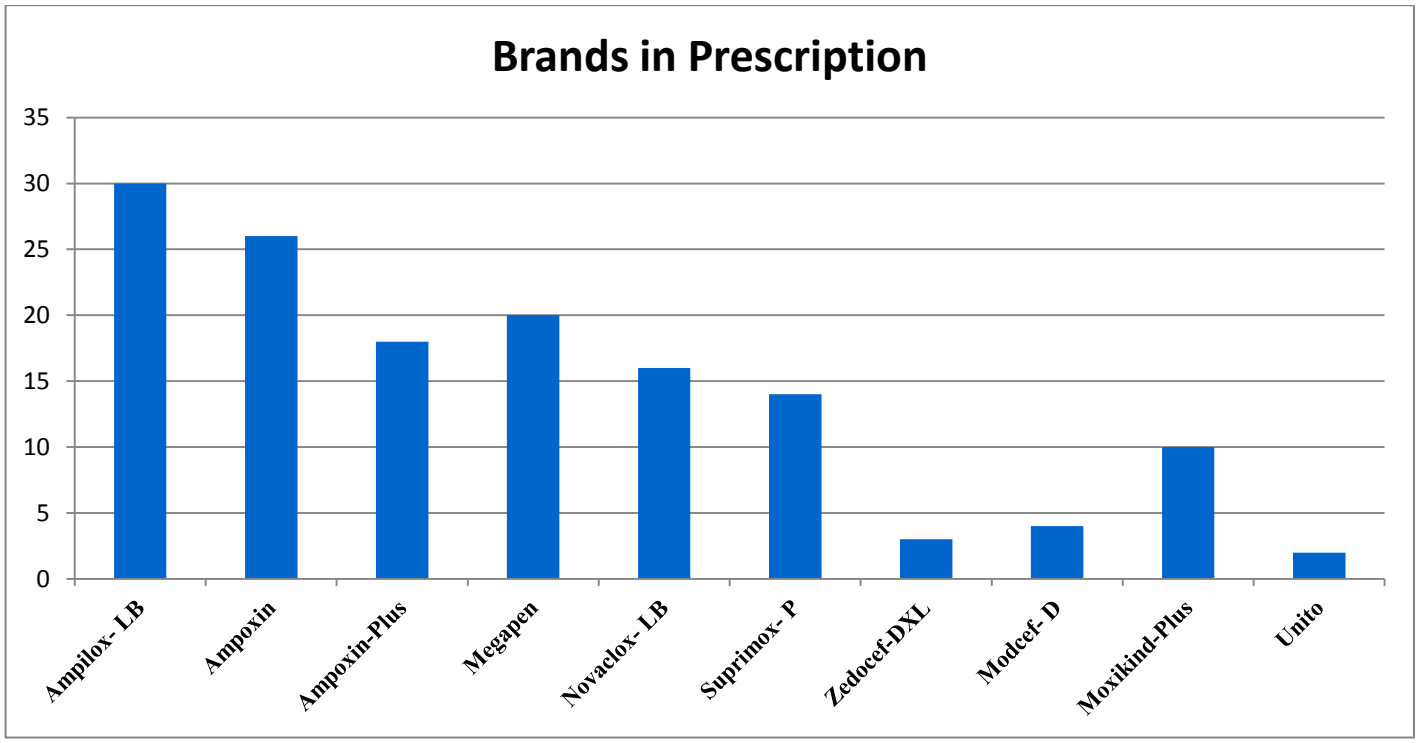

Figure No: - 16

Brands	Ampilox-LB	Ampoxin	Ampoxin-Plus	Megapen	Novaclox-LB	Suprimox-P	Zedocef-DXL	Modcef-D	Moxikind Plus	Unito
Brands in Prescription	30	26	18	20	16	14	3	4	10	2

Table No: - 8

Interpretation:-

- From the above graph it is clear that Ampilox-LB is at 1st position in terms of prescription writing for Dicloxacillin combination.
- Ampoxin – Plus, Megapan, Novaclox- LB & Supirmax- P are moderately prescribed.
- And Modcef- D, Zedocef- DXL & Unito are at a very low prescribed brands.

2. Which brands are generally available at your counter with this combination?

Figure No: - 15

Brands	Ampilox-LB	Ampoxin	Ampoxin-Plus	Megapen	Novaclox-LB	Suprimox-P	Zedocef-DXL	Modcef-D	Moxikind Plus	Unito
Brands Available	29	24	21	19	20	20	7	6	14	4

Table No: - 7

Interpretation:-

- The availability of Ampilox- LB is better from other brands.
- Ampoxin, Ampoxin – Plus, Megapan, Novaclox- LB & Supirmax- P are moderately available.
- And Modcef- D, Zedocef- DXL & Unito are available at a low level.

3. Most selling brand of the combination is?

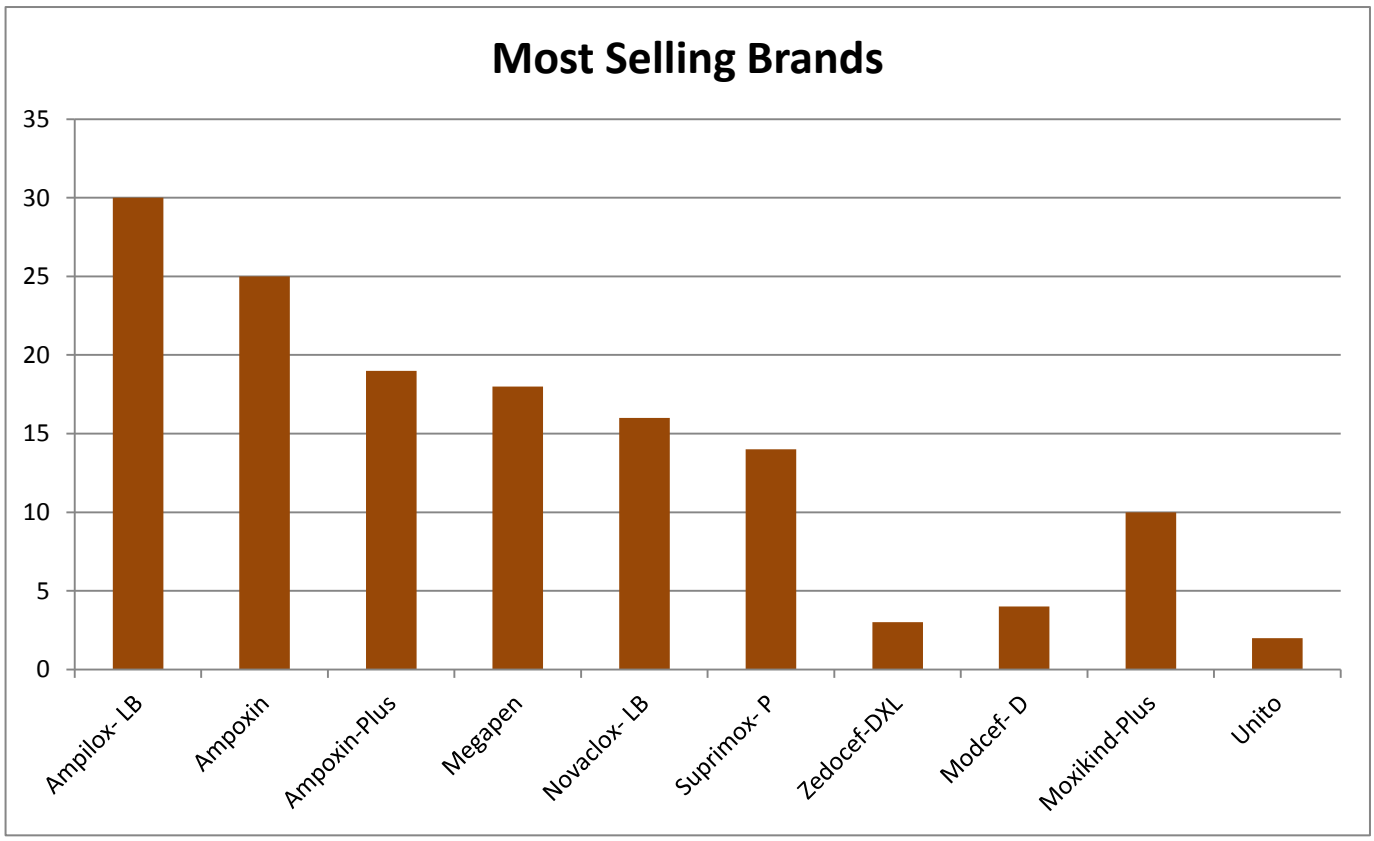

Figure No: - 14

Brands	Ampilox-LB	Ampoxin	Ampoxin-Plus	Megapen	Novaclox-LB	Suprimox-P	Zedocef-DXL	Modcef-D	Moxikind Plus	Unito
Most Selling Brands	30	25	19	18	16	14	3	4	10	2

Table No: - 6

Interpretation:-

- From the above graph it is clear that Ampilox-LB is at 1st position in terms of Sales.
- Ampoxin is at 2nd position in Sales.
- Sales Ampoxin – Plus, Megapan, Novaclox- LB & Supirmax- P are at 3rd, 4th, & 5th position.
- And Modcef- D, Zedocef- DXL & Unito are very low selling brands.

RECOMMENDATIONS

RECOMMENDATIONS

1. Many Paediatrics Doctors in the market not willing to prescribe the combination of Dicloxacillin + Ampicilline because of non availability of paediatric dose in the market, so there should be a low dose of Dicloxacillin + Ampicilline launched in the market so that more prescription can be generated for this combination.
2. **Market Positioning: -** This drug should be promoted to surgeons who use antibiotic combinations to prevent chances of infection after surgery. This drug should position in the market to be used as post operative therapy.

LEARNINGS

LEARNING

1. I got an opportunity to apply the various theories that had been taught in modules hence gained practical experience.
2. I got to know how the different departments in an organization in accordance with each other towards a common goal.
3. The research paper review gave me a lot of knowledge about how studies are conducted for the molecule.
4. The field work taught me how important is to build relationship with the doctors and chemist.
5. I also designed a questionnaire for the study which gave me a lot of knowledge about how the questions are to be framed so as to get the data for the study and also how to extract information from the data collected.
6. During the summer internship I got to actually experience how the multi-national companies function in different locations.
7. In the internship period i got to know the importance of hard and soft skills and technical knowledge and also how important it is to create the right combination of the two to get success in any project.

REFERENCE

REFERENCES

1. http://www.cs.stedwards.edu/chem/Chemistry/CHEM43/CHEM43/Antibiotics/Antibiotics.HTML#general
2. http://en.wikipedia.org/wiki/Dicloxacillin
3. http://en.wikipedia.org/wiki/Combination_therapy
4. http://www.mims.com/India/drug/search/dicloxacillin
5. http://www.abbott.co.in

ANNEXURE

ANNEXURE

For Doctors:-

Name of doctor: _____

Specialization: _____

Name of hospital/clinic: _____

1. Approximately Patients examine by you per week, that you prescribe Dicloxacillin combination?
   A. Less than 10 B. 10-20
   C. 20-30 D. More than 30

2. What are the Indications in which you prefer antibiotic combination of Dicloxacillin?
   _____

3. Which antibiotic combination of Dicloxacillin you prefer the most?
   A. Dicloxacillin with Amoxicillin B. Dicloxacillin with Cefixime
   C. Dicloxacillin with Ampicillin D. Dicloxacillin with Cefpodoxime

4. Which Brand you prefer for the above combination and why?
   _____

5. What is the dose and duration of the treatment?
   Dose: _____
   Duration: _____

6. Do you prescribe this antibiotic combination to a particular gender?
   A. Yes then_____
   B. No

7. Does the price of the product matters to you while prescribing the product?
   A. Yes
   B. No

8. Approximately what percentage of the patient you prescribe Dicloxacillin combination?

A. 10 – 20 %
B. 21 – 30 %
C. 31 – 40 %
D. 41 % & above

For Chemist:-

Name of chemist: _____

Name & location of store:_____

1. Approximately prescription received with antibiotic combination of Dicloxacillin (in a week)?

   _____

2. Brands of this combination mentioned in prescription?

   _____ _____

   _____ _____

3. Which brands are generally available at your counter with this combination?

   _____ _____

   _____ _____

   _____ _____

4. How many units are sold at this counter per week? (1 unit = 1 strip of 10)
   a. Less than 50
   b. 50-150
   c. 150-250
   d. More than 250

5. Most selling brand of this combination is?

   _____

6. Is there any special promotion activity by the company at your counter?

   _____

   _____

7. What is your opinion for prescribed brand and other brand?

   _____

   _____