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COVID 19 Break the Chain Activities Report

First identified in the Province of Wuhan, Mainland China in December 2019, the Novel Corona Virus (COVID-19) was declared as pandemic by World health organisation (WHO) on the 11th of March 2020 due to its rapid spread among the world population. India had its index case reported on the 30th of January in the state of Kerala.

In order to control and prevent the transmission of the infection, The Government of Kerala had launched "Break the Chain" campaign and our Institution also participated in that whole heartedly. The activities performed by the College was inaugurated by Mr. Eldho Abraham MLA. Under this initiative, a Break the Chain counter was prepared at the entrance of College with facilities of both hand washing and sanitizing. All the staff members were urged to sanitize their hands before entering the premises of College.

Also the College Management procured items and prepared around 150 L of Sanitizer and 200 L of Hand wash with the help of staff members. This was then distributed among Muvattupuzha Taluk Hospital, all dispensers of Muvattupuzha, Muvattupuzha Police Station, Muvattupuzha



Excise Office, Press Club Muvattupuzha, Muvattupuzha Head Post Office, South Indian Bank Muvattupuzha, State Bank of India Muvattupuzha, Social Service Society Kothamangalam, Jeeva Milk, KCYM, Nirmala Arts and Science College, Nirmala Public School, Nirmala Matha Church, Nirmala Sadan, Nirmala Higher Secondary School, Nirmala Junior School, Holy Magi Church, Anicadu Church,

Anicadu School, NEST, Kothamangalam Bishop House.

Posters on the ways to prevent the spread of COVID 19 were also prepared and these were disseminated in public spaces in and around Muvattupuzha so as to educate the General Public.



DRUGS-FOOD INTERACTION:

PHYSICIANS AND PHARMACISTS TO DEAL WITH DRUGS CAUTIOUSLY

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Abstract: The effect of a drug on a person may be different since the drug may interact with another drug the person is taking (drug-drug interaction), food, beverages, dietary supplements the person is consuming (drug-nutrient/food interaction) or another disease the person has (drug-disease interaction). A drug interaction is a situation in which a substance affects the activity of a drug, i.e. the effects of the drugs are increased or decreased, or they produce a new effect that neither produces on its own. Physicians and pharmacists recognize that some drugs when taken simultaneously with some food can alter the body's ability to utilize a particular food or drug, or cause serious side effects. Pharmacists has a major role in preventing

drug-food interaction. Therefore, it is advisable for patients to follow the physician and doctor's instructions to obtain maximum benefits with least food-drug interactions. This review gives information about various interactions between different foods and drugs which will help physicians and pharmacists to prescribe drugs cautiously with only suitable food supplement to get maximum benefit for the patient.

Keywords: Drug-nutrient/food interaction, Physicians and pharmacists.

Introduction: If anytime food or beverage changes the effects of a drug, this change results in a food-drug interaction. Certain

foods and specific nutrients present in foods, if ingested concurrently with some drugs, may affect the overall bioavailability, pharmacokinetics, pharmacodynamics and therapeutic efficacy of the medications. Food can alter the time of medications reaction in the body and the total amount of medication delivered. Moreover, the therapeutic efficacy of many drugs depends on the nutritional status of the individual. In other words, the presence or absence of some nutrients in the gastrointestinal tract and/or in the body's physiological system, such as in the blood, can enhance or impair the rate of drug absorption and metabolism. Food-drug interactions can occur with prescription drugs, over-the-counter drugs, herbal products, and dietary supplements^[1,2].

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Figure -1: Drug–fruits interactions

Drug–food interactions can be a major source of inconvenience for the patient and can lead to non-adherence through disruptions in a patient's daily schedule. Unless advised to the contrary, patients often take drugs with meals as a suitable adherence reminder and to lessen gastrointestinal (GI) side effects. Lack of knowledge of potentially significant drug–food interactions can lead to poor clinical outcome^[2].

Underlying mechanisms of food effect on drug exposure⁽³⁾

Physiological and Physicochemical Mechanisms:

Dietary substances can alter drug absorption, distribution, metabolism, and/or excretion (ADME) *via* physiologic and physicochemical mechanisms. Physiologic/mechanical mechanisms include delayed gastric emptying, stimulated /increased bile or splanchnic blood flow, and GI pH or flora changes. Alterations of such processes can lead to reduced absorption of some drugs (*e.g.*, penicillin's, angiotensin-converting enzyme inhibitors).

Physicochemical mechanisms include binding of the drug by the food. For example, enteral nutrition formulas are incompatible with the antiepileptic agent, phenytoin, which can bind to proteins and salts in enteral formulations, resulting in reduced phenytoin absorption and potentially inadequate seizure control. Some tetracycline's and fluoroquinolones can bind to divalent cation-containing products (*e.g.*, calcium in dairy), resulting in reduced drug absorption and potential therapeutic failure. High fat meals can increase drug absorption by improving solubility, such as with some antiretroviral protease inhibitors.

Biochemical Mechanisms: Biochemical mechanisms include interference with co-factor formation or function, potentiation of drug pharmacodynamics, and modification of drug metabolizing enzyme/transporter function by the dietary substance. For example, vitamin K-rich foods interfere with co-factor function and should be consumed cautiously with the anticoagulant, warfarin, as they can disrupt vitamin K metabolism and increase risk of bleeding or clot formation. Isoniazid and monoamine oxidase inhibitors, used to treat tuberculosis and depression, respectively, inhibit the breakdown of endogenous and dietary amines; a tyramine-rich diet can potentiate a hypertensive crisis.

Effect of drug food interaction⁽⁴⁾

A food–drug interaction can:

- ☐ Alter the intended response of medication
- ☐ Cause a side effect from a medicine to get worse or better
- ☐ Alter the normal nutritional status of the body
- ☐ They can create a new unintended effect

Foods can interfere with the stages of drug action in a number of ways:

The most common effect is for foods to interfere with drug absorption. Absorption is the transfer of a drug from its site of administration to the blood stream. Food may affect drug absorption in the GI tract by altering gastric pH, secretion, gastrointestinal motility and transit time. Foods may also influence the bioavailability of drugs by direct binding of drugs to substances, altering luminal pH, gastric emptying and intestinal transit time. This may result in a change in the rate of absorption or extent of drug absorption or both and drugs get less effective because less drug gets into the blood and to the site of action. Second, nutrients or other chemicals in foods can affect how a drug is used in the body. Drugs are eliminated from the body either unchanged through the kidneys and bile, or they may undergo some chemical changes that allow them to be more easily excreted. The process of undergoing chemical changes is called biotransformation, or metabolism. Food may alter the hepatic metabolism of some drugs. Third, excretion of drugs from the body may be affected by foods, nutrients, or other substances. When a drug is taken into and distributed throughout the body, it must be subsequently removed, or concentrations of the drug would continue to rise with each successive dose. The complete removal of the drug from the body is referred to as elimination. Foods may alter the urinary pH, which can affect the activity of certain drugs. The half-lives of some medications can be significantly changed by alterations in urinary pH. Therefore, the half-life of acidic drugs will be extended in acidic urine because the drug is in its unionized form. With some medications, it's important to avoid taking food and medication together because the food can make the drug less effective in the body. For other drugs, it may be good to take the drug with food to prevent stomach irritation.

Factors affecting extend of interaction between drug and food.⁽¹⁾

The impact of drug-food interactions depends on a variety of intervening factors like dosage of the drug, person's age, size and state of health. Apart from these, the time at which foods and the medications are taken also play an important role. Avoidance of drug interactions does not necessarily mean avoiding drugs or foods. In the case of tetracycline and dairy products, these should simply be taken at different times; rather than eliminating one or the other from the diet. Sufficient information about the medications and timing of medications around food intake can help to avoid drug interaction problems.

FOOD	DRUG	INTERACTIONS ⁽⁸⁾
1. Calcium - rich foods Dairy products such as milk, yogurt and cheese.	Antibiotics Cephalexin(Keflex) Amoxicillin(Amoxil) Clindamycin(Clepcin) Metronidazole(Elagyl) Ciprofloxacin(Cipro) Levofloxacin(Levaquin) Amoxicillin potassium Clavulanate(Augmentin)	These antibiotics may bind to the calcium Present in the milk which forms an insoluble substance in the stomach and upper small intestine that the body is unable to absorb. Antibiotics works better if taken 1 hour or 2 hours before or after eating.
2. Pickle, Cured and Fermented Foods Red wine, hard cheese, chocolate, aged cheese, Brewer's yeast, yeast extracts, pickled herring	MAIOs antidepressants	These food contains tyramine which causes dangerous increase in blood pressure among patients taking certain medications for Parkinson's disease.
3. Vitamin k – rich foods Broccoli, Brussels sprouts, cabbage, kale, spinach and other leafy greens	Warfarin (Coumadin)	Warfarin is a blood-thinning medication that helps to treat and prevent blood clots. Consuming certain foods, especially those rich in vitamin K, can diminish warfarin's
4. Grapefruit and Grapefruit Juice	Statins simvastatin (Zocor) lovastatin (Altoprev) atorvastatin (Lipitor)	Statins are highly effective cholesterol-lowering drugs. eating grapefruit or drinking grapefruit juice causes increase in medication potency by interacting with enzymes in the small intestine and liver.
5. Alcohol	Insulin, Oral Diabetic Agents	It increase or prolongs the effects of insulin or oral diabetic agents (pills) and thus leads to hypoglycaemia.
6. High-Fiber Diets(wheat bran)	Digoxin(Digitalis, Digitek, Lanoxin)	Digoxin is used to strengthen the contraction of the heart muscle, slow the heart rate, and promote the elimination of fluid from body tissues. Dietary fiber can slow down the absorption of digoxin and lessen its effectiveness.
7.Grapefruit	Calcium Channel Blockers felodipine (Plendil) nicardipine (Cardene) nisoldipine (Sular) weaker with amlodipine (Norvasc), diltiazem (Cardizem), and nifedipine (Adalat).	Calcium channel blockers are prescribed for high blood pressure. Grapefruit alters the breakdown of the calcium channel blockers, possibly results in excessively high blood levels of the drug along with an increased risk of serious side effects.
8.Cinnamon	Anti-diabetics	This spice in large amounts can lower blood sugar which is similar to the action of <u>diabetes</u> drugs which results in dangerous lowering of blood sugar. A sprinkle of cinnamon in cooking is safe, but avoid consuming high-dose supplements.

9. Fish oil supplements	Blood thinners	Large amounts of fish oil also can thin the blood. Combined with these kinds of medications, this can pose a health risk
10. Iodine-Rich Foods seafood and seaweed, such as kelp and nori.	Antithyroid Drugs	Antithyroid drugs prevents iodine absorption in the stomach. A high-iodine diet requires higher doses of Antithyroid
11. Alcohol	NSAIDS (aspirin and ibuprofen)	stomach bleeding and serious damage to your liver.
12. Bananas	ACE inhibitors ramipril (Altace), captopril (Capoten) moexipril (Univasc) perindopril (Aceon) trandolapril (Mavik) benazepril/hctz (Lotensin) lisinopril (Prinivil, Zestril) enalapril maleate (Vasotec) fosinopril sodium (Monopril) quinapril hydrochloride (Accupril)	High amounts of potassium can cause heart palpitations and an irregular heartbeat
13. Black Licorice	Hypertensive drugs	Black liquorice contains glycyrrhiza which causes an irregular heartbeat or even death, when combined with digoxin. Black liquorice reduces the effectiveness of most blood pressure drugs, intensify the side effects of blood thinners and lower potassium levels when consumed with birth-control pills.
14. Soybean flour, walnuts	Thyroid drugs such as levothyroxine (Levothroid, Levoxyl, Synthroid).	These high-fiber foods can prevent one's body from absorbing the medications.
15. Potassium (bananas, apricots, coconut, dates, prunes, peaches, grapefruit, tomatoes, and oranges)	Spironolactone (aldactone)	Spironolactone, a potassium-sparing diuretic, in combination with foods high in potassium, could result in hyperkalemia.
16. Cow's milk	Antitumor Drugs (Mercaptopurine)	Xanthine Oxidase present in milk may potentially reduce bioavailability of mercaptopurine.
17. Coffee	Bronchodilators	Stimulate the CNS and causes Hyperexcitation
18. High fat meals	Anti-fungal agents Griseofulvin	Griseofulvin has a significantly increased absorption when taken with high fat meals.
19. Mineral oils	Laxatives	Overuse can cause a deficiency of vitamins A, D, E, and K.

Figure -2: Major drug food interactions

Different ways to minimize drug food interactions⁽⁴⁾

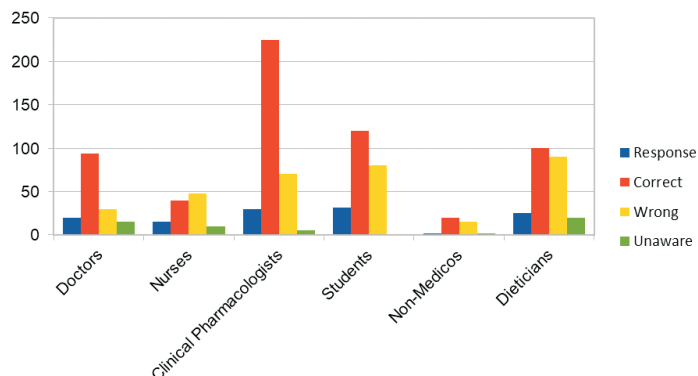
- The number of food-drug interactions with harmful results is small. However, to be safe, one should carefully read the labels of all prescription and over-the-counter drugs to check for interactions.
- In addition, always talk with the doctor or pharmacist about any known food (or drug) interactions with one's medications and clarify treatment options.
- If the medications do not seem to produce the desired effects, or if one experience unwanted side effects (particularly if the effects change during the course of treatment), review one's diet with the doctor or pharmacist to assess for food-drug interactions.
- It is usually best to take medication with a full glass of water. This may help to prevent stomach irritation and improve absorption. But don't stir the medication into food or drink unless advised by the doctor or pharmacist.

Role of pharmacists in prevention of drug food interactions⁽¹⁾

Pharmacists have an extensive knowledge of how drugs work, their side effects, and the medications, supplements, and foods they interact with. A pharmacist plays a pivotal role in the identification, detection, prevention, and management of drug-food interactions and pharmacists in practice setting need to be vigilant in monitoring for potential drug-food interactions. This can be done by thoroughly screening the patient's medication profile. Pharmacists should advise the patients regarding foods or beverages to avoid when taking certain medications. It is important for pharmacists to keep up-to-date on potential drug-food interactions of medications, especially today's newly released drugs, so that they may counsel the patients properly. In providing drug information to patients, pharmacists often discuss potential side effects of the drugs and how the medication should be taken. It is important to provide information to patients on when to take their medications in relation to food intake. Patients should be given instructions and counselling regarding the potential for drug-food interactions before their hospital discharge. Elderly patients taking three or more medications for chronic conditions such as hypertension, depression, diabetes, high cholesterol or congestive heart failure are at a high risk of drug food interaction and should be monitored for possible such interactions.

Benefits of minimizing drug food interactions⁽¹¹⁾:

- Medications achieve their intended effects.
- Patients do not discontinue their drug.
- The need for additional medications is minimized.
- Fewer caloric or nutrient supplements are required.
- Adverse side effects are avoided.
- Optimal nutritional status is preserved.
- Accidents and injuries are avoided.
- Disease complications are minimized.
- The cost of health care services is reduced.
- There is less professional liability.
- Licensing agency requirements are met



Studies conducted on drug food interactions:

Studies were conducted on food-drug interactions by collecting seventy-five outpatient prescriptions at a random from various local hospitals in Karachi. In the present work, out of thirty-four drugs prescribed to 34 patients, food drug interactions were found in twenty-seven cases. It means that absorption of approximately 80% of the drugs found to be affected by food. It was also found that only few studies have been carried out so far on the effect of food on drug disposition in the Asian population. Thus more studies on food-drug interactions particularly in the local population is recommended in order to determine the effect of food and food components on drug disposition.⁽⁶⁾

A Questionnaire Study of Food -Drug Interaction was conducted to access the Knowledge of people from diverse backgrounds in Hyderabad, India. A total of 345 respondents were enrolled in the study. The data was analysed and the results were expressed in percentages. Out of 252 respondents which are valid 85.68% believed that they were aware of food drug interactions while 14.28% were unaware. Knowledge of Clinical Pharmacologists on food drug interactions was better than doctors, nurses and pharmacy students. The other outcome of this survey showed that individuals from non-medical field had a limited awareness on food drug interactions. This survey also found that people from non-medical field use herbal supplements concomitantly with prescription and OTC medication.⁽⁶⁾

Conclusion:

Interactions between drugs and food products occur in various ways and in various steps ranging from ingestion, absorption, metabolism, and excretion of both the drug and food product. Some of the effects induced by food-drug interactions, such as an increase in the blood drug level, may have potential therapeutic benefits while some interactions may result in detrimental physiological effects. Like drugs, foods are not tested as comprehensively so they may interact with prescription or over-the-counter drugs. It is therefore important to understand and examine the potential interactions between foods and drugs and their specific effects at an individual level. Much more research is needed for identification of this kind of interactions and pharmacists should be aware of the necessity of monitoring for potential drug-food interactions and advising patients regarding foods or beverages to avoid when taking certain medications.

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PHARMACOTHERAPEUTIC APPROACHES AND COMMUNICATION STRATEGIES FOR THE MANAGEMENT OF NOVAL CORONA VIRUS-A SYSTEMATIC REVIEW

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INTRODUCTION

COVID-19, is an infectious disease caused by a newly discovered coronavirus (severe acute respiratory syndrome corona-virus 2, SARS-CoV-2), began to spread in Wuhan, China, in December 2019. As of April 5, 2020, there have been more than 1.2 million reported cases and 69000 deaths in more than 200 countries. [1]

Coronaviruses have enveloped, positive sense single-stranded RNA genome, infecting humans and a wide range of animals. They were known as coronaviruses, based on their morphology as spherical virions with a central shell and surface projections identical to a solar corona (Latin: corona means crown). There are four separate subfamilies, the alpha, beta, gamma, and delta coronaviruses. Alpha and beta coronaviruses appear to come from mammals, especially from bats, whereas gamma and delta corona viruses derive from pigs and birds [2]

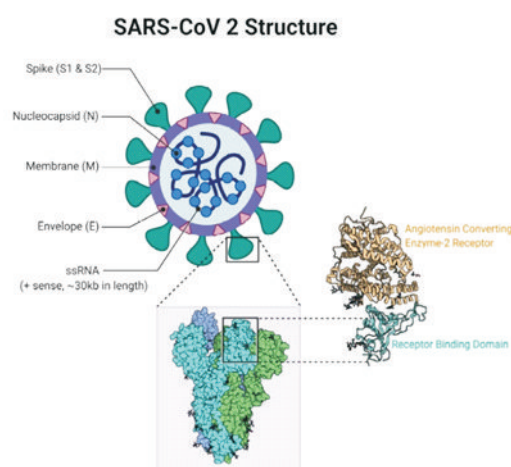


Figure 1: represents the SARS-CoV 2 Structure

Among these COVID-19 patients, most of them have the common symptoms including fever, cough, and myalgia or fatigue at onset. [3]

World Health Organization (WHO) has declared corona virus disease 2019 (COVID-19) as a Public Health Emergency of International Concern and released interim guidelines on patient management. Due to the severity and the spreading of COVID-19 (novel coronavirus pneumonia, NCP), the Chinese government and the medical institutions have executed strict strategies to control the spread. [4]

Antiviral agents were included in the latest guidelines from the National Health Commission (NHC) including, Lopinavir/Ritonavir, Chloroquine Phosphate, Ribavirin, and Arbidol. There is no approved treatment for COVID-19; the care advised is to give supportive management according to each patient's need; Such as antipyretics for fever and oxygen therapy for patients with respiratory distress. Moreover, WHO recommendations for severe cases are to give empiric antimicrobial therapy and implement mechanical ventilation depending on the patient's clinical condition. The treatment protocols across the world are similar. They are using Hydroxychloroquine, Chloroquine phosphate, Remdesivir, and Lopinavir/Ritonavir. This review will summarize the most current pharmacotherapeutic Strategies and supportive measures prescribed in the treatment of noval coronavirus.

METHODOLOGY

This is a retrospective study. A literature review was performed using different electronic databases (PubMed, Medline, Google scholar). Full articles in English, published were included. The search terminology included: COVID-19, SARS-COV-2 and COVID-19 in combination with treatment, Communication strategies. The search resulted from different article. Additional relevant articles were identified from the review of citation referenced. This review mainly focused on Pharmacotherapeutic approaches and Communication strategies for the management of COVID-19 patients.

EPIDEMIOLOGY

The first reported patients happened in December 2019. At the beginning, morbidity was very low. However, in January 2020 it hit a turning point. A significant rise in infected patients occurred in cities outside of Hubei Province during the second half of this month, due to the movement of people before the Chinese lunar New Year. After an exponential rise until January 23, 2020 the infection traveled through countries and draws significant global interest. [2]

February 20, 2020, there are a total of 75 995 confirmed cases, including 2239 fatalities in China (mainland: 75 891; Hong Kong: 68; Macao: 10; and Taiwan: 26), and 1200 confirmed cases, including eight fatal ones outside China, in all five continents (**Figure 2**).

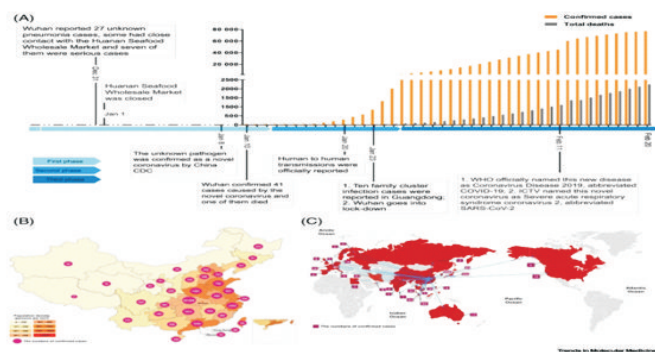


Figure 2: Spread of COVID-19 epidemic

The first case outside of China was reported in Thailand on January 13, caused by a Wuhan resident travelling to this country. On January 19 cases were reported from outside Wuhan, in Beijing City, and in the Guangdong Province, indicating that the virus had spread within China, and the total number of confirmed cases rose to 205. On February 10, retrospective analysis showed that the number of clustered cases accounted for 50–80% of all confirmed cases in Beijing, Shanghai, Jiangsu, and Shandong. On January 30, the number increased 240-fold, reaching 9826 confirmed cases, and the WHO declared this epidemic a PHEIC. By February 11, 44 730 confirmed cases and 16 067 suspected cases were reported in about 1386 counties and districts in China. By February 12, due to adoption of a new clinical definition for diagnosis in Hubei province, newly confirmed cases jumped to 14 840, of which 13 332 cases were based only on clinical diagnosis. By that time, 25 countries had reported 60 329 infections, with 1471 times the initial number. [5]

Table 1 represents the COVID-19 infections across five Asian countries as of March 30, 2020

Table 1: COVID-19 infections across Five Asian Countries As of March 30 2020					
	CHINA	INDIA	INDONESIA	JAPAN	SOUTH KOREA
Total cases	82,544	1,071	1,414	1,866	9,661
Cases per million people	59	1	5	15	186
Average new cases per day	106	34	40	50	230

CURRENT THERAPEUTIC STRATEGIES FOR TREATING COVID-19

In the destitute of definitive and specific treatment regimens, strategies including early diagnosis, timely reporting, isolation, and supportive treatments are important line of actions against COVID-19 infections. [6] On January 25, 2020 a joint research team from the Shanghai Institute of Materia Medica and Shanghai Tech University conducted a silicon drug screening and enzyme activity testing and reported 30 agents with significant antiviral activity against SARS-CoV-2. Nevertheless, the efficacy of these treatment regimens remains to be verified by appropriately designed clinical trials. [2]

The following are some drugs which have been utilized in the treatment of COVID-19

Chloroquine

Chloroquine is a 9-aminoquinoline that has been known since 1934. Specifically synthesised to be used as an antimalarial agent. [7] In vitro, chloroquine is reported to be a variable bioactive agent that has antiviral activity against RNA viruses, such as rabies virus, poliovirus, HIV, and hepatitis C virus. Chloroquine is known to prevent infection of the cells by the virus through increasing the endosomal pH needed for virus for cell fusion, and interfering with the glycosylation of SARS-CoV cell receptors. [2]

Chloroquine can impair the replication of several viruses by interacting with the endosome-mediated viral entry or the late stages of replication of enveloped viruses (figure 3)

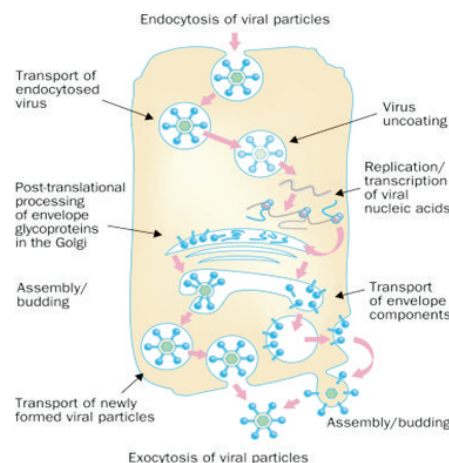


Figure 3: Mechanism of virus replication

Per the fact sheets provided with the emergency use authorization for patients meeting the aforementioned criteria, the recommended dosing for chloroquine is 1000 mg on day 1, followed by 500 mg daily via oral tablets for 4 to 7 days. [8]

For the use of chloroquine an expert consensus was published on February 20, 2020, by a multicenter collaboration group of the Department of Science and Technology of Guangdong Province and Health Commission of Guangdong Province. Preliminary measures recommended by the panel include blood tests to rule out the risk of anemia, thrombocytopenia or leukopenia, as well as serum electrolyte abnormalities and/or hepatic and renal function dysfunctions. It is recommended to rule out the development of QT interval prolongation or bradycardia and to perform patient interviews to find out visual and/or mental disturbance. [2]

Remdesivir

It is a potential drug for treatment of COVID-19. It is a phosphoramidate prodrug of an adenosine C-nucleoside and a broad-spectrum antiviral agent synthesized and developed by Gilead Sciences in 2017 as a treatment for Ebola virus infection. [6] It has also effectively inhibited virus infection in a human cell line (Huh-7 cells of human liver cancer) that is susceptible to SARS-CoV-2. Animal experiments showed that remdesivir can significantly reduce the viral load of MERS-CoV in the lung tissue of infected mice, enhance lung function and minimize pathological damage to the lung tissue. [2]

The safety and pharmacokinetics of remdesivir were evaluated in single- and multiple-dose phase 1 clinical trials. Intravenous infusions between 3 mg and 225 mg were well-tolerated without any evidence of liver or kidney toxicity. Remdesivir demonstrated linear pharmacokinetics within this dose range and an intracellular half-life of greater than 35 hours. Following multiple-dose administrations, reversible aspartate aminotransferase and alanine transaminase elevations occurred. The current dose under investigation is a single 200-mg loading dose, followed by 100-mg daily infusion. However, successful case reports describing the use of remdesivir for COVID-19 have been reported. [65,66] Clinical trials are ongoing to evaluate the safety and antiviral activity of remdesivir in patients with mild to moderate or severe COVID-19. [1]

Lopinavir/Ritonavir

US Food and Drug Administration (FDA) – approved oral combination agent for treating HIV infection. [1]

After the emergence of severe acute respiratory syndrome (SARS) in 2003, screening of approved drugs identified lopinavir, a human immunodeficiency virus (HIV) type 1 aspartate protease inhibitor, as having in vitro inhibitory activity against SARS-CoV, the virus that causes SARS in humans. Ritonavir is combined with lopinavir to increase its plasma half-life through the inhibition of cytochrome P450. Studies found that lopinavir–ritonavir treatment did not significantly accelerate clinical improvement, reduce

mortality, or diminish throat viral RNA detectability in patients with serious Covid-19. [9]

Tocilizumab

Tocilizumab (branded as Actemra) is a humanized mAb developed by Roche and Chugai Pharmaceutical for treating RA and systemic juvenile idiopathic arthritis patients. [6] Tocilizumab treatment is effective to reduce the mortality of severe COVID-19. Tocilizumab is the first marketed IL-6 blocking antibody through targeting IL-6 receptors. [10] A study published in April 2020 reported that 21 severe or critical COVID-19 patients in China were treated with the compound, with 20 of them recovered at the time of publication and 1 on the way to recovery. [6]

In order to verify whether targeted IL-6, may potentially be the effective and safe way to reduce mortality of COVID-19, 21 patients diagnosed as severe or critical COVID-19 from Te First Affiliated Hospital of University of Science and Technology of China and Anhui Fuyang Second People's Hospital were recruited and given tocilizumab therapy. With the maximum dose of a single dose should not exceed 800 mg. Note that patients with allergic reactions, such as tuberculosis and other active infection are contraindicated. They suggest that IL-6 concentrations can be detected if fever persists for more than 3 days. By chemiluminescence detection, if serum IL-6 content is over 20 pg/ml, Tocilizumab can be used. IL-6 will be temporarily increased in serum in the next few days, for its receptors have been blocked by Tocilizumab. Together, Tocilizumab treatment is recommended to reduce the mortality of severe COVID-19. [10]

Oseltamivir

It is a drug approved for treatment of influenza A and B. Oseltamivir targets the neuraminidase distributed on the surface of the influenza virus to inhibit the spread of the influenza virus in the human body. A study in Wuhan reported that no positive outcomes were observed after receiving antiviral treatment with oseltamivir. Several clinical trials are still evaluating the effectiveness of oseltamivir in treating SARS-CoV-2 infection. [6]

Favipiravir

In China, On February 15, 2020, favipiravir was approved for the treatment of the 2019 novel influenza. The value of Favipiravir EC₅₀ in Vero E6 cells (cells used in the novel coronavirus study) was as high as 67 Mm². The prodrug favipiravir first enters the infected cells through endocytosis and is then transformed into active favipiravir ribofuranosyl phosphates through phosphoribosylation and phosphorylation. The antiviral activity is exhibited through selectively targeting conservative catalytic domain of RNA-dependent RNA polymerase (RdRp), interrupting the nucleotide incorporation process. Curr Pharmacol Rep during viral RNA replication. The dysregulation in viral RNA replication results in increased number and frequency of transition mutations including replacement of guanine (G) by

adenine (A) and cytosine (C) by thymine (T) or C by Uracil (U) which induces destructive mutagenesis in RNA viruses. Favipiravir has been used in the treatment of infectious diseases caused by RNA viruses such as influenza, Ebola, and norovirus.[6]

Dosing variations are likely due to the lower favipiravir EC50 values described against influenza compared with Ebola and SARS-CoV-2. Doses at the higher end of the dosing range should be considered for the treatment of COVID-19. A loading dose is recommended (2400 mg to 3000 mg every 12 hours \times 2 doses) followed by a maintenance dose (1200 mg to 1800 mg every 12 hours). The half-life is approximately 5 hours. The agent has a mild adverse effect profile and is overall well-tolerated, although the adverse event profile for higher-dose regimens is limited.[1]

PATIENT COUNSELLING

The Centers for Disease Control and Prevention (CDC, 2020) recommends the following everyday actions to help deter the spread of all respiratory viruses:

- ☐ Wash your hands often with soap and water for 20 seconds. If soap and water are not available, use an alcohol-based hand sanitizer.
- ☐ Avoid touching your eyes, nose and mouth with unwashed hands.
- ☐ Avoid close contact with people who are sick.
- ☐ Stay at home when you are sick.
- ☐ Cover your cough or sneeze with a tissue, then throw the tissue in the trash
- ☐ Clean and disinfect frequently touched objects and surfaces

Anyone who has been exposed to COVID-19 should contact healthcare provider immediately. [11]

COMMUNICATION STRATEGIES

Effectual communication between individuals and their provider is a crucial element of patient-centered care and superlative health care delivery.[12] For patients, communication difficulties created by hearing loss or exacerbated by use of a mask can result in difficulty conveying an illness or symptoms, poor or incorrect adherence with therapeutic recommendations, and low satisfaction.[13] Further on patient-provider interaction, the use of masks can interfere with providers communication with colleagues and staff, particularly when hearing loss is present. The Hearing aid devices can improve health-related quality of life. [14]

Providers and patients can also consider use of assistive listening devices, such as personal sound amplification devices (eg, Pocketalker).

Communication is a milestone for the better outcome of health care. Enhanced use of PPE, in particular face masks, represents challenges for patient interaction and daily communication. Simple communication strategies and

assistive listening devices can help to overcome these challenges.

Table 2 represent the use of simple communication strategies modified in consideration of mask use.

Table 2: Communication Strategies along with mask	
Attentiveness	Before beginning conversation say people's name to get their attention
Face to Face ' interaction	If you are not getting visual clues from patient mouth, Facing the person will improve signal to noise ratio
Use clear speech	This is not exaggerated speech or shouting. Talk slightly slower and louder and takes pauses.
Use repair strategies	If you donot understand, ask for clarification by repeating the information heard.
Usage of technology	Use amplify devices(eg: hearing aids). Use EarMachine app
Have forbearance	Try not to get frustrated and not blame the other person

CONCLUSION

The COVID-19 represents the greatest public health crisis all over the world and mortality rate increasing day by day. In this present scenario they are no therapies or vaccine have been shown effective to prevent COVID-19, so develop self immunity to fight against corona virus. All of the drug options are based on the experience treating SARS, MERS or some other viruses. For the better analyzing of this novel corona virus, more research needs to be done to get better strategies for the management of COVID-19.

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PhD AWARDEE

Dr. Fels Saju

Assistant Professor has been awarded PhD on the topic "Developing an Ultra deformable Vesicular transportation of Boswellic acid in pursuit of Rheumatoid Arthritis".
from JJT University, Rajasthan, India.

RESOURCE PERSONALITIES FROM NIRMALA



Dr. R. Badmanaban

Head, Department of Pharmacognosy
Topic: Marker Based Quality Control Approach for Polyherbal Formulations
Organised By:
J.K.K.M Institute of Health Science, Tamilnadu,



Dr. Bharat Mishra

Head, Department of Pharmacology
Topic: Overcome the overloading obstacles.
Organised By: JCI, Muvattupuzha
Topic: Publication process :
A Simplified insight
Organised By: J.K.K.M Institute of Health Science, Tamilnadu.



Dr. Fels Saju

Assistant Professor, Department of Pharmaceutics
Topic: Design of Experiments using Design expert software- Concepts and Hands on training
Organised By : Nazareth College of Pharmacy, Thiruvalla
Topic: Pharmacy Practice Regulation 2015,
Organised by: Kerala state pharmacy Council at IMA hall , Kottayam
Topic: Nail it right now , Junior Chamber International,
Organised By: Cyber city kakkanad
Topic: Step Ahead - Career orientation, Goal Setting and Interview preparation
Organised by: Nirmala College of Pharmacy, Muvattupuzha.



Mr. Manu Jose

Assistant Professor,
Department of pharmaceutical chemistry and Analysis
Topic: Significance of Analytical Chemistry in Pharmacy
Organised By:
Holy Grace Academy of Pharmacy.



Dr. Shaji George

Head, Department of Pharmacy Practice
Topic: Bloom Taxonomy
Organised By: Sree Krishna college of pharmacy and research centre, Thiruvananthapuram.

Congratulations

ALL INDIA GPAT 2020 WINNERS



VISHNUGOVIND A.
ALL INDIA RANK : 84
KERALA RANK : 2



SUVARNA VARGHESE
ALL INDIA RANK: 632



SAHILA T.S.
ALL INDIA RANK: 729



ANJANA C. NAIR
ALL INDIA RANK: 1582



HIBA ASSSAINAR
ALL INDIA RANK: 2840



DIONNE MARIA THOMAS
ALL INDIA RANK : 3117



HANNA PARVEEN
ALL INDIA RANK : 3325



VISHNUPRIYA P.H.
ALL INDIA RANK : 3635



JESNA P.A.
ALL INDIA RANK : 4413



FATHIMA MEETHIAN
ALL INDIA RANK : 4949

ALUMNI OF NCP



Our Alumni are the ones who take up the fame of the college to further heights. The college conducts alumni meet providing a platform for cherishing college memories to build up student teacher relation. A grand Alumni meet was conducted on 29th February 2020.

NILA

MODULE VIII 2020

National Workshop on Spectral Data Analysis



Summary of the programme:

A national workshop on spectral data analysis was held on 27th February 2019 as a part of Nila Module 8. The aim of the workshop was to provide a platform for the students and faculty to get theoretical and practical aspects of spectroscopic techniques and analytical data. The program was organized by the Pharmaceutical Chemistry Department, Nirmala College of Pharmacy.

Forty delegates from Nirmala College of Pharmacy along with Thirty seven faculty members and student delegates from various colleges of India participated in the workshop.

The workshop opened on an auspicious note with a prayer and welcome address by Dr.Ms Deepa Jose , Vice Principal, Nirmala College of Pharmacy.

The inaugural address was delivered by Administrator Rev. Fr. Jos Mathai Myladiyath .Principal Dr. manju Maria Mathews gave Felicitation Speech. They shared the importance of the spectral data analysis in research.

Dr.Shyam KumarB , HOD, Dept Of Pharmaceutical Chemistry introduced the Speaker of the Day Dr.Pankaj Kumar, MS ,PhD, Assistant Professor NSGM Institute of Pharmaceutical Sciences ,Mangalore.

NILA

MODULE IX 2020

A two day workshop on Pharmacovigilance - Basics to Advanced “Medication use without harm for enhanced patient care” was organised by the Department of Pharmacy Practise NCP in Collaboration With Regional Training Center for South Zone - PvPI, Department of Clinical Pharmacy JSS Medical College and Hospital, Mysuru on 24 and 25th October 2019. The resource persons of the day were Dr. M. Ramesh, (Professor & Head, Department of Pharmacy Practice& Coordinator, AMCJSS Medical College & Hospital, Mysuru), Ms.Juny Sebastian (Lecturer), Mr. Krishna Undela (Lecturer) Department of Pharmacy Practice, JSS College of Pharmacy, JSS AHER, Mysuru. The workshop was open for all pharma fraternities (Students & Staff), with a limited seating capacity of 120. Six other colleges participated with 60 students and five faculties. The workshop provided a platform for aspiring students and faculties an insight view of Pharmacovigilance. by enabling the attendees to undergo hands-on training to excel in the field and be equipped with a skill on Pharmacovigilance.

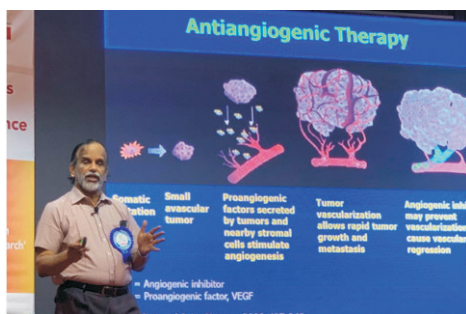


NILA

MODULE X 2020

A two day National Seminar was organized by the Pharmacology Department with more than 500 delegates including pharma students, research scholars, faculties from various pharmacy institutions all over India on 28th and 29th of February 2020 on the topic “Paradigm shift for Emerging Paraphernalia in Advancement of Cancer Research”. On the

first day, there were three plenary lectures by eminent speakers on topics of relevance in cancer research. On the second day, a lecture followed by the e poster presentation and hands on training on “Target protein for cancer treatment: docking techniques” were organized.

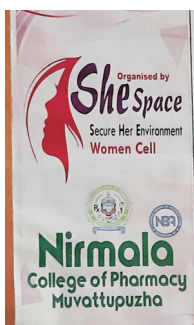


Lecture by Dr. V. P. Gangadharan on the topic "Advancement in early detection and treatment of common cancers techniques" were organized.

Lecture by : Dr. Bathula Surendar Reddy Scientist C, CSIR – IICT on the topic "Liposomal formulation of DNA alkylating drugs using anti-ligase therapeutic lipids"

INTERNATIONAL WOMEN'S DAY CELEBRATION 2020

‘Feminism is not about making strong woman; it's about changing the way the world perceives that strength'



Nirmala College of Pharmacy, Muvattupuzha, has organized International Women's Day celebration on 7th March 2020. The main spotlight of this program was the debate competition on the topic “Whether Women Empowerment is limited to debates”. 6 groups each with

two students participated. The debate highlighted the breakthrough of women since 1900s to this current era and also underscore the challenges faced by women's even on these days. The students participated with full of zeal.

FIRST PRIZE



THAMANNA IQBAL

DECLAMATION

SECOND PRIZE



ANUVINDH SURESH

STRINGS WESTERN

THIRD PRIZE



SIJIN BIJU

DIGITAL PAINTING

Nirmala College of Pharmacy, Muvattupuzha

KUHS

Students Union

'19-20

Bella Ciao
InterZone Arts Fest



GRADUATION CEREMONY

The graduation ceremony of (2015-2019) batch B.Pharm students and (2017-19) M.Pharm batch was conducted ceremoniously. His excellency Mar George Madathikandathil, Bishop, Kothamangalam diocese inaugurated the function. Dr.Murali A,Hepatopancreato Biliary and Gastro surgeon, Caritas Hospital gave the Graduation Day speech. Msgr. Dr.Cherian Kanjirakombil presided over the function.



NSS ACTIVITIES ACADEMIC YEAR 2019-20

NIRMALA COLLEGE OF PHARMACY, MUVATTUPUZHA



Mr.EBY GEORGE
NSS IN-CHARGE

SL NO	ACTIVITY	DATE
1.	Punarjani 2019	06-06-2019
2.	Observance of Gandhi Jayanthi	02-10-2019
3.	NSS kit distribution at tribal colony- pooyamkutty	05-10-2019
4.	Tenalach office inauguration and jaivasameeksha	20-11-2019
5.	Observance of national constitution day	26-11-2019
6.	Observance of 31st national road safety week	17-10-2020
7.	Observance of international woman's day	07-03-2020

OBSERVANCE OF GANDHI JAYANTHI KSRTC BUS CLEANING CAMPAIGN

DATED: 2ND OCTOBER 2019



NSS unit (MP020-1) of Nirmala college of pharmacy, Muvattupuzha in association with State Bank of India, regional office, Muvattupuzha, had conducted a cleaning campaign at KSRTC bus station, Muvattupuzha, with respect to 150th birthday of Mahatma Gandhi on 2nd October 2019. MLA inaugurated the campaign by washing a KSRTC bus in the station followed by student volunteers of Nirmala

College of pharmacy. A total of 42 students (NSS volunteers) of Nirmala College of pharmacy participated in cleaning of KSRTC buses with the premises of KSRTC bus stand. A total of 8 KSRTC buses were cleaned and washed by dividing volunteers into 8 groups each having 5 students. A total of 25 SBI staffs joined the campaign.



TENALACH OFFICE INAUGURATION AND JAIVASAMEEKSHA 2019



A program was conducted on 20th of November, 2019 by Tenalach in association with Nagarjuna Ayurveda group- Jaivasameeksha. The program started by the green planting

action, under the supervision of Administrator, Principal and Dr. Benny Jacob and Dr. Baby Joseph at 9:30 am. The students and faculties were also involved in planting around the herbal plants.

OBSERVANCE OF 31ST NATIONAL ROAD SAFETY WEEK 2020



NATIONAL
ROAD
SAFETY
WEEK
2020

A seminar was conducted as part of 31st National road safety week 2020 at Nirmala College of Pharmacy. The session started with a first aid class revealing the importance and methodology of giving first aid during accidents by Mr Jobin Kunjumon V, Assistant Professor, Nirmala college of pharmacy, Muvattupuzha. The session pinpointed the steps and their methods of delivering first aid along with

Powerpoint visual presentation. The second session was handled by respected Assistant Motor Vehicle inspector Mr Manoj V P along with videos and cases reported in Kerala, the relevance of wearing helmets, defensive driving protocol and current scenario of Kerala motor vehicle rules and implementations. The last session was handled by Mr. K.S. Eldhose, about fire and rescue both in road accidents and homes.

PLACEMENT CELL ACTIVITIES AT NIRMALA



Dr. Prasanth B

Head-Training & Placement Cell

Co-ordinators:

Dr. Fels Saju (Career & Guidance Cell)

Ms. Meby Susan Mathew

Mr. Jobin Kunjumon.

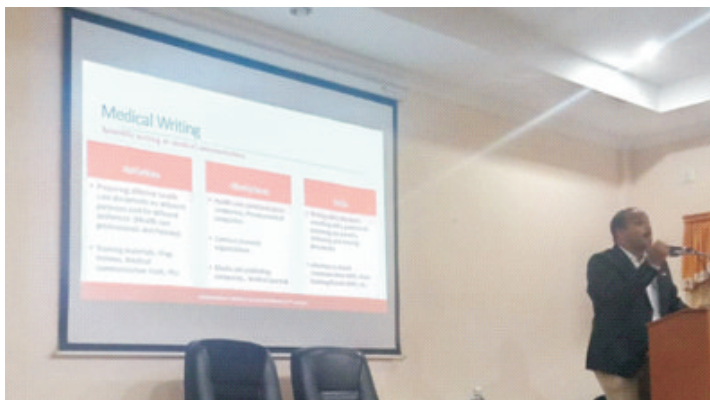
Training and Placement Cell is constantly involved in moulding B.Pharm, PharmD and M.Pharm students in such a manner to ensure that the career goals of students are achieved. The Cell is conducting Mock Interviews to provide exposure to students for interviews in campus placements. One month training for B.Pharm students is being guided by the Cell according to the choices made by them in industry, hospitals and research centres. Classes by well known resource persons related to soft skill development and career prospects are included in the year

round schedule. Students are being made well aware of the recent developments in pharma job sector by experts and college faculty so that they can choose their career path. They are also given informations by guest lectures regarding abroad job prospects and higher education. For the last two years our students got campus placements in US based multinational company like IQVIA, which serves the combined industries of health information technology and clinical research. Last year our students got campus placement in LIFE Pharmacy, UAE and Apollo Hospital Chennai. Our students are also employed at well known organizations as Mylan laboratories, Aster UAE which make our industry linkages more stronger. Our students are also placed in renowned institutions in Kerala such as Rajagiri Hospital, Alwaye, Renai Medicty, Kochi, Aster Medicity, Kochi, Amrita Hospitals, Kochi and Sance laboratories, Pala. In coming years we are looking forward for collaborations with more organizations for recruitment and training of students.

SL. NO	PLACEMENT ACTIVITY	RESOURCE PERSON	TOPIC	PARTICIPANTS
1	Guest Lecture	Dr Jimmy Jose, Associate Professor, School of Pharmacy, University of Nizwa, Oman.	Career Opportunities for Pharmacy Graduates.	III PharmD VI PharmD, IV B.Pharm.(Total 88 students)
2	Guest Lecture: Campus Placements an Overview	Mr Joel Emmanuel, CEO, Town technologies Pvt. Ltd., Cochin	Usage of softwares in Career Job Search	IV Year B.Pharm, V Semester B.Pharm. (Total 110 students)
3	Alumni Interaction	Mr Anandhu K S(2014-2018 Batch), M.Pharm Scholar, NIPER, Guwahatti. Mr. Stephin Baby(2015-2019 Batch), M.Pharm Scholar, NIPER, Hyderabad	Usage of softwares in Career Job Search	IV Year B.Pharm, V Semester B.Pharm. (Total 110 students)
4	Guest Lecture: Orientation On Career Prospects	Resource Person: Dr. John Jose, Asst. Professor, Dept. of CSE, IIT Guwahatti	Topic: "How to plan your college days for a professionally rewarding career."	II PharmD, III PharmD and IV PharmD (Total 118 students)
5	Guest lecture: Orientation on Higher education Opportunities Abroad	Officials,Santa Monica Study Abroad Pvt. Ltd., Kochi	Higher Education Opportunities in Abroad Countries	V PharmD and IV B.Pharm (Total 87 students)

Guest Lecture: Career Opportunities for Pharmacy Graduates

Resource Person: Dr Jimmy Jose, Associate Professor, School of Pharmacy, University of Nizwa, Oman.
Topic : Career Opportunities for Pharmacy Graduates.



Guest Lecture: Campus Placements an Overview

Resource person: Mr. Joel Emmanuel, CEO, Town Technologies Pvt.Ltd, Cochin



Alumni Interaction: Higher Education Prospects

Resource Person: Mr Anandhu K S(2014-2018 Batch), M.Pharm Scholar, NIPER, Guwahatti.
Mr. Stephin Baby(2015-2019 Batch), M.Pharm Scholar, NIPER, Hyderabad



Guest lecture: Orientation On Career Prospects

Resource Person: Dr. John Jose, Asst. Professor, Dept. of CSE, IIT Guwahatti
Topic: "How to plan your college days for a professionally rewarding career."



CAMPUS PLACEMENTS: IQVIA
Post: Centralized Monitoring Assessment.





Students Placed By Campus Recruitment-IQVIA

Congratulations
for Campus Selection

Placement Drive:
IQVIA -January 2020



Jeeva Joseph
VIth Pharm D



Amratha K Thomas
VIth Pharm D



Edwin Antony
VIth Pharm D



Aneeta Jacob
VIth Pharm D



Anitta Merlin Augustin
VIth Pharm D



Sandra Reji
VIth Pharm D



Maria Rani Jose
IVth B Pharm



Anitta C Jaison
IVth B Pharm



Ann Aswathy Thomas
IVth B Pharm



Toms Augustine
IVth B Pharm



Amrutha Soman
IVth B Pharm



Jashna K Kani
IInd M. Pharm



Training and Placement Cell
NIRMALA COLLEGE OF PHARMACY
MUVATTUPUZHA, KERALA - 686661



CAMPUS PLACEMENTS: LIFE UAE



GUEST LECTURE: ORIENTATION ON HIGHER EDUCATION OPPORTUNITIES ABROAD

Resource Person: Officials, Santa Monica Study Abroad Pvt. Ltd., Kochi



ISPOR

Dr. SUJA ABRAHAM
ISPOR IN CHARGE



SL.NO	MONTH	ACTIVITY
	1 to 5-08-2019	Web based course (i) Basics of health economics (ii) Signal detection and causality assessment (iii) Good clinical practice (iv) Antibiotic stewardship – A competency based approach (v) Drug safety surveillance and FDA ADR systems
1.	29-08-2019	Class by Dr.Vrinda Nampoothiri on “Antibiotic Stewardship Programme: Interventions and Implications”
2.	25-09-2019	Community campaign on World Pharmacist day “To promote safe and effective medicines for all”
3.	27-09-2019	Oral Hygiene Camp by 'Anoor Dental College'
4.	30-09-2019	Awareness class at St.Sebastians School on the topic "Causes of Heart Diseases"
5.	1 to 5-10-2019	Web based course (i) FDA regulation of color additives in drug products (ii) Across the regulatory, research, and clinical care environment: Sex and gender influences (iii) Building confidence in generic narrow therapeutic index drugs (iv) An update to the FDA adverse event reporting system public dashboard (v) Statistical reasoning and algorithms in pharmacovigilance (vi) Ongoing role of FDA in medication error prevention (vii) Type 2 DM and CVD management (viii) Locating and using medical information in digital age (ix) Health research fundamentals 3D printing in drug development and emerging healthcare

SL.NO	MONTH	ACTIVITY
6.	2-10-2019	Awareness classes at Gynaecology , Dialysis and Ortho units of Nirmala Medical Centre
7.	4-10-2019	Hands on training session for students on compression only life support at Nirmala Medical Centre in association with doctors from Indian Society of Anesthesiologist
8.	16-10-2019	Hands on training session for staffs on compression only life support in Lulu shopping mall along with doctors from Indian Society of Anesthesiologist
9.	23-11- 2019	Geriatric medication counselling
10.	24-01-2020	Cancer awareness programme in Chavara International School
11.	04-02-2020	Cancer awareness programme in Carithas Hospital
12	06 to 07-03-2020	Mentor-Mentee Interaction on Pharmacoeconomics and Outcome Research
13	20-04-2020	Started ISPOR blog- NIRMALAINFOBLISS (i) What's next? Digital eye strain!!! (ii) PASS-A new pass for outcome research (iii) Super human Vs Tiny viruses (iv) Cost effective analysis (v) The Synergistic Revolution- India as a Generic Hub (vi) Drug Pipelines: Together for the Healthier (vii) Digital Therapeutics (viii) Impact of corona on mental health (ix) Did lock down really locked down the spread of COVID-19 in Tamil Nadu (x) Long term complications of Corona (xi) Drug re purposing – Making marvellous out of the existing COVID-19 Immunity Passport: Practical and ethical challenges

Achievements:

1. ISPOR student chapter at Nirmala College of Pharmacy is approved as the Mentor chapter for Narayana Pharmacy College, Nellore, AP
2. Awarded with second place in ISPOR outstanding LMIC student chapter award



DETAILS OF SEMINARS/WORKSHOPS CONDUCTED

(07/2019-07/2020)

SL	DATE	TOPIC	SPEAKER	SEMINAR/W ORKSHOP	NO.OF PARTIC IPANTS
1.	26/07/2019	Opportunity In pharma industry	Mr. Ajay B Pazhayattil Pharmaceutical Quality and Technical Operations Leader , Canada	Invited Talk	65
2.	02/08/2019	Mental Health,Leadershioskill, communication skill & mind power enchancement	Dr.DavidBanji Professor and chairman of PG studies JASAN University,Saudi.	Invited talk	90
3.	16/08/2019	Role of ADME and toxicity in the drug candidate selection using multiparameter optimization	Girinath G Pillai, PhD,CSO, ZastralInnovation,Kalyan Nagar,Banglore-560043.	FDP	75
4.	21/08/2019	Standardisation and quality control of herbal products	Bindu A R, Professor CPAS	Invited talk	65
5.	29/08/2019	Antimicrobial stewardship- interventions and implications	Dr.VrindaNampoothiri , Clinical Pharmacist ,Amrita Institute Of Medical Science And Research Centre	Invited talk	90
6.	04/10/2019	Hands on training on compression only life support	Dr.Manjesh,Dr.Vijesh,Dr.Mathew ,Dr.Sreekumar From Indian Society Of Anaesthesiology	workshop	60
7.	19/10/2019	Fundamentals of Clinical Research	Athira B Research scholar,MCOPS	Invited talk	30
8.	26/10/2019	Molecular Docking	Dr.Bijoy Mathew Associate Professor Ahalia school of pharmacy,palakkad	workshop	25
9.	28/10/2019	Advanced and ethical teaching ,studentship and publication science	Prof.Dr.MUnnikrishnan	FDP	50
10	18/06/2020	Covid 19: A zoonotic spillover-Dilemma in drugs and vaccines intervention	Dr.Dhanaraj S A, Dr.Bharat Mishra	Webinar	970

Editor's Desk...



Dr.Dona Maria Jetto

Assistant Professor

Department of Pharmacy Practice



Dr.Merrin Joseph

Assistant Professor

Department of Pharmacy Practice

COURSES :

B.Pharm (Batchelor of Pharmacy - 4 yrs)

M.Pharm in Pharmaceutics (2 yrs)

Pharm.D (Doctor of Pharmacy - 6 yrs)



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