



# PUSHPAGIRI

We care God cures

## COLLEGE OF PHARMACY

An official publication of the Department of Pharmacy Practice, Pushpagiri College of Pharmacy, Thiruvalla, Pathanamthitta (Dist.) Kerala  
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# CLINICAL PHARMA PRACTICE NEWS ECHO

### Contents

1. Article by **Dr. Manu Krishnan**
2. Article by **M.Surulivelrajan**
3. Article by **Ms. Sissy Aloysia**
4. Article by **Ms. Jancy Kuruvila**
5. Article by **Mrs.Rani Manju**
6. **Drugs Banned in India**
7. **Department News**

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### Vision :

"We care..... God cures....."

### Mission :

To work towards a knowledge society with a life in abundance, through science and technology, improving health care of our immediate community, state, country and the world at large.

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### CEO's MESSAGE

I am extremely delighted to know that Pushpagiri College of Pharmacy is releasing a special newsletter oriented on Clinical Pharmacy practice services. This newsletter is a product of an excellent team work with dedication, determination and discipline. Wishing you a grand success.

**Rev. Dr. Shaji Mathews Vazhayil**  
(Chairman & Chief Executive)



### FROM THE DIRECTOR OF ACADEMICS

I take this opportunity to congratulate all the devoted hands who worked behind this endeavor and I wish all the success to Clinical Pharma Practice News Echo.

**Rev. Dr. Mathew Mazhavancheril**  
Chief Advisor & Director- Academics & Research



### FROM THE DIRECTOR

I am very happy to know that Pushpagiri College of pharmacy is bringing out a newsletter from the department of Pharmacy Practice which highlights the clinical pharmacy oriented services.

**Rev. Fr. Mathew Vadakkekuttu**  
(Director Medicity)

### FROM THE PRINCIPAL'S DESK



From the depth of my heart I am very contented to declare that the Pharmacy practice department of our college is releasing the first issue of Clinical Pharma Practice News Echo. Heartful congratulations and appreciation for the team members for putting this forward.

**Prof. Dr. Mathew George,**  
Principal



### FROM THE EDITORIAL ADVISORY BOARD

It's my immense pleasure to congratulate the editorial team members for releasing the Clinical Pharma Practice News Echo which reflects the Pharmacy practice activities in enhancing better pharmaceutical care to the society.

**Prof. Dr. Lincy Joseph,** HOD  
(Department of Pharmaceutical Chemistry)

### EDITOR'S DESK

We, the editorial committee have great privilege on releasing the first issue of our Clinical Pharmacy Practice news letter of Pushpagiri College of Pharmacy. This news letter covers the information related to the clinical practice activities and achievements in department of Pharmacy Practice. Clinical pharmacy is concerned with the science and practice of rational medication use. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialized therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes. The overall goal of clinical pharmacy activities is to promote the correct and appropriate use of medicinal products and devices. We extend our sincere thanks to all the devoted hands worked behind this venture. Please drop your valuable suggestions and feedback at: pcppharmacypracticenewsletter@gmail.com.



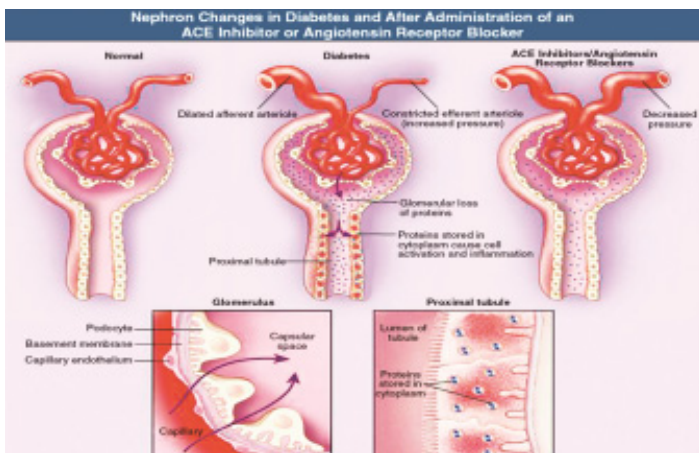
# Diabetic Nephropathy



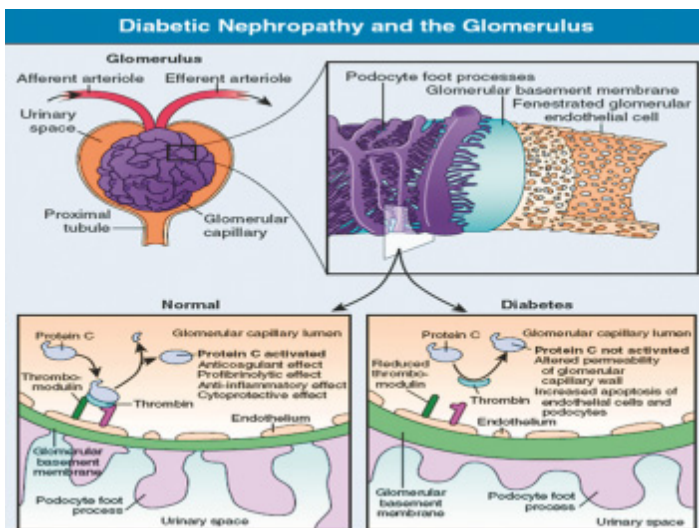
**Dr. Manu Krishnan**  
MBBS, MD, DM

**I**t is the single most common cause of chronic renal failure in the United States.

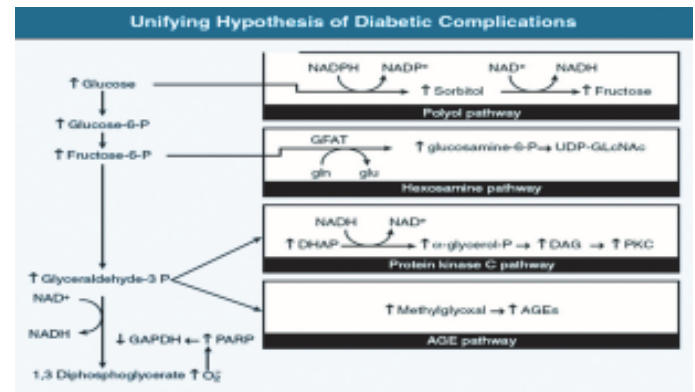
The thickening of the Glomerular basement membrane (GBM) is a sensitive indicator for the presence of diabetes but correlates poorly with the presence or absence of clinically significant nephropathy. Composition of the GBM is altered notably with a loss of heparan sulfate moieties that form the negatively charged filtration barrier.



*All are true regarding Diabetic Nephropathy except that the thickening of the GBM correlates well with the presence or absence of clinically significant nephropathy.*



There are increases in glomerular capillary pressure (Intraglomerular hypertension) in alterations in renal structure and function. Direct effects of hyperglycemia on the actin cytoskeleton of renal mesangial and vascular smooth-muscle cells as well as diabetes-associated changes in circulating factors such as atrial natriuretic factor, angiotensin II, and insulin-like growth factor (IGF) may account for this.



## Polyol Pathway - The role of polyols in diabetic complications

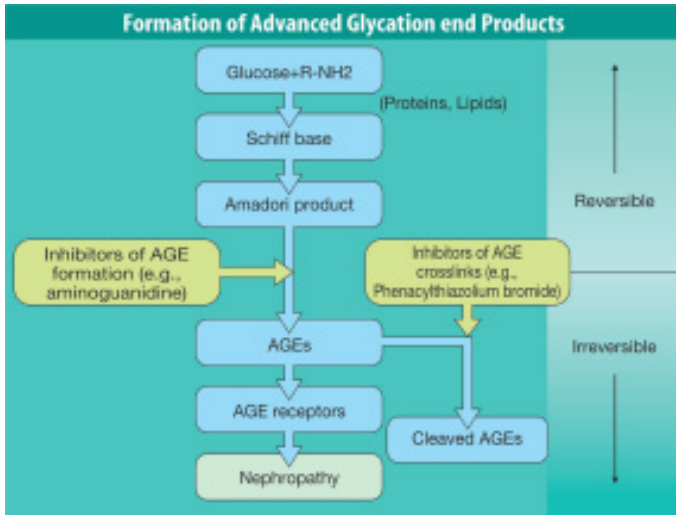
This has been assessed with aldose reductase inhibitors, such as sorbinil, tolrestat, and ponalrestat. They have shown promise in preventing diabetic cataracts and improving or stabilizing diabetic neuropathy.

## Hexosamine Pathway

This pathway enhances transcription of key mediators, such as TGF- $\alpha$ 1 and plasminogen activator inhibitor. The Glucosamine-mediated modification of the enzyme Akt/PKB reduces expression of endothelial NOS and promotes apoptosis of cells.

## Protein Kinase C (PKC) Pathway

In this pathway, hyperglycemia have been attributed to activation of PKC, a family of serine - threonine kinases that regulate diverse vascular functions. PKC was detected in almost all types of cells and tissues in the body. The activation of PKC is involved in the signal regulation of many physiological and pathological processes. PKC- $\alpha$ -selective inhibitor ameliorated glomerular hyperfiltration, albuminuria, and renal TGF- $\alpha$  overexpression as well as extracellular matrix accumulation. Recent findings suggest that isoform-specific PKC inhibitors are potentially beneficial to the prevention or treatment of some common diseases, including cancers and diabetic vascular complications. Safety and efficacy studies of the PKC inhibitors will be required through large-scale long-term clinical trials.



*Protein Kinase C (PKC) Pathway*

Many of the adverse effects of hyperglycemia have been attributed to activation of PKC. The activity of PKC, especially the membrane-bound form, is increased in the retina, aorta, and heart.

The goals of treatment for diabetic nephropathy are aimed to slow the progression of kidney damage and control related complications. Diabetic nephropathy is the most common cause of end-stage kidney disease, which may require hemodialysis or even kidney transplantation. It is associated with an increased risk of death in general, particularly from cardiovascular disease. It is expected that the number of people with diabetes and consequently diabetic nephropathy will rise substantially by the year 2050.

## EVOLVING ROLE OF CLINICAL PHARMACIST IN THE CHANGING HEALTH CARE SCENARIO



**M. Surulivelrajan, M.Pharm, PhD**  
Associate Professor, Department of Pharmacy Practice,  
Manipal College of pharmaceutical Sciences,  
Manipal University, Karnataka

Clinical Pharmacy concept is established well in western countries. In the Indian context, this concept is gaining attention in the past decade. Postgraduate level education in pharmacy practice is established a decade back and Pharm.D curriculum is introduced a few years back. But the hospitals and health care centres are reluctant to appoint clinical pharmacists. Most of the graduates either left to greener pastures abroad or got into jobs in the industrial sector.

In the recent past, few positive changes are happening in the health care sectors. For any health care setting to grow in the present day scenario there is a need to go for national and international level accreditations. In the national level NABH is the major accreditation body. In the international level JAC is the major body. Hospitals having these accreditations are well placed to receive patients referred by various insurance companies and as well as international patients. So, many of the large corporate hospitals are taking steps to get accredited by these agencies.

These accrediting bodies have focus on the quality of service delivery. One of their main focus will be on the medication management and safety. They are



expecting the hospitals to have medication review process and document safety issues. They stress on the adverse event documentation systems, medication error documentation, and methods to reduce medication errors. They expect documentation and prevention of dispensing errors in the pharmacy.

The requirements of accrediting agencies in the area of medication related issues have opened an avenue for clinical pharmacists. Many of the hospitals are looking for suitable candidates to take care of these roles as required by the agencies. Aspiring clinical pharmacists should be aware of the evolving scenario and get trained adequately in these areas. This will help them getting a place inside the health care setting. Such an entry will pave the way for professional growth of clinical pharmacy in future. Let us all hope, this evolving scenario shall unfold for the benefit of our profession.



## NEWS ROOM



**Ms. Sissy Aloysia**  
Asst. Professor, Department of Pharmacy Practice

### FDA approves first therapy for high-risk Neuroblastoma

The U.S. Food and Drug Administration approved Unituxin (dinutuximab) as part of first-line therapy for pediatric patients with high-risk neuroblastoma, a type of cancer that most often occurs in young children. Neuroblastoma is a rare cancer that forms from immature nerve cells. It usually begins in the adrenal glands but may also develop in the abdomen, chest or in nerve tissue near the spine. Neuroblastoma typically occurs in children younger than five years of age. According to the National Cancer Institute, neuroblastoma occurs in approximately one out of 100,000 children and is slightly more common in boys. Patients with high-risk neuroblastoma have a 40 to 50 percent chance of long term survival despite aggressive therapy.

#### MECHANISM OF ACTION

Unituxin (dinutuximab) binds to the glycolipid GD2. This glycolipid is expressed on neuroblastoma cells and on normal cells of neuroectodermal origin, including the central nervous system and peripheral nerves. Dinutuximab binds to cell surface GD2 and induces cell lysis of GD2- expressing cells through antibody-dependent cell-mediated cytotoxicity (ADCC) and complement-dependent cytotoxicity (CDC).

#### RECOMMENDED DOSE

The recommended dose of Unituxin is 17.5 mg/m<sup>2</sup> /day administered as an intravenous infusion over 10 to 20 hours for 4 consecutive days for a maximum of 5 cycles.

Unituxin carries a Boxed Warning alerting patients and health care professionals that Unituxin irritates nerve cells, causing severe pain that requires treatment with intravenous narcotics and can also cause nerve damage and life-threatening infusion reactions, including upper airway swelling, difficulty in breathing during or shortly following completion of the infusion.

Unituxin may also cause other serious side effects including

- Pain
- Pyrexia
- Thrombocytopenia
- Lymphopenia
- Infusion reactions
- Hypotension
- Hyponatremia
- Increased alanine aminotransferase
- Anemia
- Vomiting
- Diarrhea
- Hypokalemia & Hypoalbuminemia
- Capillary leak syndrome
- Neutropenia
- Urticaria
- Increased aspartate aminotransferase
- Hypocalcemia

Unituxin is contraindicated in patients with history of anaphylaxis to Dinutuximab.

### RECENTLY APPROVED DRUGS BY FDA

SL.NO	DRUGS NAME	INDICATION	DATE OF APPROVAL
1	Synjardy (Empagliflozin & metformin hydrochloride)	Type 2 Diabetes mellitus	August 2015
2	Repatha (Evolocumab)	Hyperlipidemia	August 2015
3	Vraylar (Cariprazine)	Schizophrenia & bipolar disorder	September 2015
4	Xuriden (Uridine triacetate)	Hereditary orotic aciduria	September 2015
5	Lonsurf (Trifluridine & tipiracil)	Metastatic colorectal cancer	September 2015
6	Glycopyrrolate Inhalation Powder	COPD	October 2015



SL.NO	DRUGS NAME	INDICATION	DATE OF APPROVAL
7	Buprenorphine Hydrochloride	Chronic Pain Management	October 2015
8	Patiromer Oral Suspension	Hyperkalemia	October 2015
9	Necitumumab	Non-Small Cell Lung Cancer	November 2015
10	Mepolizumab	Maintenance Treatment of Asthma in Paediatrics	November 2015



**Ms. Jancy kuruvila**  
Asst. Professor, Department of Pharmacy Practice

## BRAIN DEATH

**Brain death** is the complete and irreversible loss of brain function (including involuntary activity necessary to sustain life). Brain death is used as an indicator of legal death in many jurisdictions.

Brain death occurs when a critically ill patient dies sometime after being placed on life support. This situation can occur after, for example, a heart attack or stroke. A person is confirmed as being dead when their brain stem function is permanently lost. The brain stem is the lower part of the brain that's connected to the spinal cord. The brain stem is responsible for regulating most of the body's automatic functions that are essential for life. These include:

- Breathing
- Heartbeat
- Blood pressure
- Swallowing

The brain stem also relays information to and from the brain to the rest of the body, so it plays an important role in the brain's core functions, such as consciousness, awareness and movement. After brain death, it's not possible for someone to remain conscious, combined with the inability to breathe or maintain bodily functions, this constitutes the death of a person.

### How brain death occurs

Brain death can occur when the blood and/or oxygen supply to the brain is stopped. This can be caused by:

- **Cardiac arrest** – when the heart stops beating and the brain is starved of oxygen.

- **Heart attack** – a serious medical emergency that occurs when the blood supply to the heart is suddenly blocked.
- **Stroke** – a serious medical emergency that occurs when the blood supply to the brain is blocked or interrupted.
- **Blood clot** – a blockage in a blood vessel that disturbs or blocks the flow of blood around your body.

Brain death can also occur as a result of:

- Severe head injury
- Brain haemorrhage
- Infections, such as encephalitis
- Brain tumour



Brain death is not the same as coma; coma is similar to deep sleep, except that no amount of external stimuli can prompt the brain to become awake and alert. However, the person is alive and recovery is possible. Brain death is often confused with a persistent vegetative state, but these conditions are not the same either.

A persistent vegetative state means the person has lost higher brain functions, but their undamaged brain stem still allows essential functions like heart rate and respiration to continue. A person in a vegetative state is alive and may recover to some degree within a given time. Brain death means the person has died.

In some cases, a person who is brain dead may be a candidate for organ donation. Patients classified as brain-dead can have their organs surgically removed for organ donation.

The heart is a part of the autonomic nervous system and thus has the ability to beat independently of the



brain as long as it has oxygen. The heart will eventually stop beating as all bodily systems begin to stop working shortly after brain death. Once this process has begun, it cannot be reversed. At the time a physician declares brain death, the patient is dead.

Mechanical support (a breathing machine) keeps oxygen going to the organs until they can be recovered for transplant. The machine is not keeping the patient alive; it is merely keeping the organs viable until they can be recovered. The legal time of death is the date and time that doctors determine that all brain activity has ceased. This is the time that is noted on the patient's death certificate.

### Signs of brain death

Some of the signs of brain death include:

- The pupils don't respond to light.

- The person shows no reaction to pain.
- The eyes don't blink when the eye surface is touched (corneal reflex).
- The eyes don't move when the head is moved (oculocephalic reflex).
- The eyes don't move when ice water is poured into the ear (oculo-vestibular reflex).
- There is no gagging reflex when the back of the throat is touched.
- The person doesn't breathe when the ventilator is switched off.
- An electroencephalogram test shows no brain activity at all.

## Can rice give you cancer?



**Mrs. Rani Manju**  
Asst. Professor,  
Department of Pharmacy Practice

**T**here are two sides to rice: the grain that feeds half the world and the primary carcinogenic source of inorganic arsenic in our diet.

Arsenic is a naturally occurring element that is ubiquitous in the environment. It is present primarily as inorganic arsenic, which is highly toxic. The chemical gets into the rice as a result of industrial contaminants and pesticides that were used in the past and can remain in the flooded paddy fields where the rice is grown for decades.

What sets rice apart is that it is the only major crop that is grown under flooded conditions of paddy fields. It is this flooding that releases inorganic arsenic, normally locked up in soil minerals, which makes it available for the plant to uptake. Rice has, typically, ten times more inorganic arsenic than other foods as reported by the European Food Standards Authority.

Chronic exposure can cause a wide range of health problems including developmental problems, heart disease, diabetes and nervous system damage. However, most distressing are lung and bladder cancers.

The first food that most people eat is rice porridge, thought suitable for weaning as rice is low in allergens,

has good textural properties and tastes bland. As babies are rapidly growing they are at a sensitive stage of development and are known to be more susceptible to inorganic arsenic than adults. Babies and young children under five also eat around three times more food on a body weight basis than adults, which means that, relatively, they have three times greater exposures to inorganic arsenic from the same food item. The rice product market for young children, which includes biscuit crackers and cereals, is booming. If the child is gluten intolerant then rice breads and rice milks can be added to this list. Gluten intolerant adults are also high rice consumers, as are those people of South-East Asian origin.

Rice contains more of the carcinogen arsenic than other grains, but researchers at Queen's University Belfast, UK found that cooking rice in a simple coffee pot removed about half the arsenic (85%). The method of rice cooking to optimize the removal of inorganic arsenic and that by using percolating technology, where cooking water is continually passed through rice in a constant flow, we could maximize removal of arsenic.

The World Health Organisation and the Food and Agriculture Organisation of the UN have just announced guidelines for inorganic arsenic in rice: 200 parts per billion for white rice and 400 parts per billion (ppb) for brown rice. Brown rice is higher in inorganic arsenic than white as arsenic is concentrated in the bran that is removed by milling to produce white rice.



## Drugs Banned in India

A number of individual drugs as well as fixed dose combinations are banned in India. The adverse effects are detected through a process of regular monitoring after the drug is released to the market called **pharmacovigilance**. If the adverse effects are severe or the risks of using the drug outweigh the benefits, or if the drug is ineffective, the country may ban the drug or the drug company may itself voluntarily withdraw the drug. Some drugs may cause adverse effects only when combined with particular drugs.

In such cases, only the fixed dose combination is banned and not the individual drugs.

A number of single drugs as well as fixed dose combinations have been banned for manufacture, marketing and distribution in India. Some drugs banned in India are mentioned below:



DRUG	INDICATION	WHY BANNED
Fenfluramine and dexfenfluramine	Used to treat obesity	Withdrawn due to reports of diseases of heart valves, fibrosis of the heart and pulmonary hypertension.
Rimonabant	Weight loss pill	Withdrawn due to serious side effects like depression, suicidal tendencies and seizures.
Sibutramine	Weight loss pill	Caused heart related side effects.
Astemizole and terfenadine	Used to treat allergies	Polymorphic ventricular tachycardia and even death when used in high doses or with drugs like erythromycin, clarithromycin and ketoconazole.
Rosiglitazone	Anti-diabetic drug	Increased risk of heart attacks.
Gatifloxacin	Antibiotic	Due to its risk for severe hyperglycemia
Tegaserod	Irritable bowel syndrome with predominantly constipation.	Increased incidence of heart attack and stroke.

## DEPARTMENT NEWS

### ➤ CONDUCTED NSS MEDICAL CAMP

The National service scheme unit of Pushpagiri College of Pharmacy organized a free medical camp on 30<sup>th</sup> May, 2015 at Pushpagiri Medicity Campus. The camp was inaugurated by Adv. Mathew T Thomas, MLA, Thiruvalla. In the medical camp, the service of eminent consultants from the departments of General Medicine, Orthopedics, Gynecology, Pediatrics, Ophthalmology and Dermatology were arranged from Pushpagiri Medical College Hospital. Free lab services and medicine samples were also distributed as part of this venture.





### INTERNATIONAL SEMINAR

The Indian association of college of pharmacy had jointly presented an international certification seminar "PHARMACY PRACTICE MODULE" during 6<sup>th</sup> to 8<sup>th</sup> August, 2015 at Pushpagiri College of Pharmacy. The seminar focused on new trends in cardiovascular diseases. The seminar was led by Dr. Krishna Kumar, Prof. of Biopharmaceutics and Pharmacokinetics, Howard University College of Pharmacy, Washington DC, USA; Dr. J. Christopher Lynch, PharmD, BCACP, Southern Illinois University, USA & Dr. Douglas Jennings, Pharm D, AACC BCPS-AQ Cardiology, Clinical Pharmacy Manager, Presbyterian Columbia University Medical Centre, New York.



### CLINICAL PHARMACY PRACTICE DEPARTMENT ACTIVITIES DURING APRIL-JULY 2015

SL.NO	ACTIVITIES	NO: OF ACTIVITIES
1	No: of Patients Counseled	1025
2	No: of Queries Answered	120
3	Adverse Drug Reaction	5
4	Pharmacist Interventions	8
5	Medication History Interview	140

Our M.Pharm pharmacy practice, Pharm.D regular and Pharm D P.B students are involved in various patient care activities such as;

- Patient counselling
- Drug information
- Medication history interview
- Bed side counselling
- Ward round participation ( General medicine, Cardiology, Pulmonary, Nephrology, Neurology, Pediatrics )

