

# *SHREENATH* *PHARMA* *MAGAZINE*

Volume 1.Issue 4 ,September 2019



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## From the Editor's Desk

Dear Readers,

Coming to the fourth issue. I firstly thank all the readers, subscribers and contributors to motivate my team at the beginning of this publication. We all grow together.

This issue of September 2019 contains the interview of Mr. Chetan Mahajan, showering light over the entrepreneurial aspects and building a company and associated outlooks. We also describe Carbaryl as the molecule of the month. Along with the above mentioned articles we have Pharma news updates from the industry and campus for our readers. In the winds of our 'World Pharmacist day' in September, an article trying to suffice and cover the important aspects a pharmacist covers that are otherwise invisible in the process.

Wishing all the readers a Happy Pharmacist day!

Happy Reading

Forum Jalundhwala

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# Dr. Reddy's crowned the first Indian Pharmaceutical Company to be accepted under the China Pilot Programme

Dr Reddy's Laboratories Ltd. became the first Indian pharmaceutical company to win approval to supply certain generic drugs to China's biggest public hospitals as the country expands a drug procurement pilot program nationwide. The drug in question? We're glad you asked. Olanzapine, an atypical antipsychotic, is primarily used to treat schizophrenia and bipolar disorder.



In September, China asked drugmakers to submit bids to supply 25 commonly used generic drugs to hospitals across the country. The move followed a pilot program in 11 major cities. From December, China will be allowing cancer patients to import drugs which are not registered with Chinese regulators.

Reference: <https://www.caixinglobal.com/2019-09-25/dr-reddys-is-first-indian-drugmaker-accepted-by-china-pilot-program-101465752.html>



## GSK Pharma ceases Ranitidine distribution and sales in India

GlaxoSmithKline Pharmaceuticals Ltd has suspended the distribution and supply of ranitidine hydrochloride products to all markets (sold under brand name Zinetac), including India, as a precautionary measure after regulatory authorities detected low-level presence of a carcinogen N-nitrosodimethylamine (NDMA) in its products. "GSK is continuing with investigations into the potential source of the NDMA. These investigations include continued engagement with our API suppliers. Patient safety remains our utmost priority and we are taking this issue very seriously," the company stated. The company sources the Ranitidine active pharmaceutical ingredient (API) from Saraca Laboratories and SMS Lifesciences for sale in the Indian market. The European Directorate for the Quality of Medicines (EDQM) has suspended the certificate of suitability of its supplier Saraca Laboratories Ltd for ranitidine hydrochloride with immediate effect.

GSK Pharmaceuticals manufactures Ranitidine Hydrochloride IP Tablets 150 mg and 300 mg under its brand Zinetac. Other companies also manufacture ranitidine. JB Chemicals manufactures ranitidine under the brand name Rantac, Sun Pharmaceuticals Ltd's Histac, Torrent Pharmaceuticals Ltd's Ranitin, Ajanta Pharma Ltd's Pepitran, etc.

Reference: <https://www.moneycontrol.com/news/business/companies/gsk-suspends-ranitidine-distribution-in->



## Lupin, Boehringer Ingelheim enter into 700millionn USD deal over anti-cancer

Lupin Ltd signed a \$700 million licensing, development and commercialization agreement with German pharmaceutical manufacturer Boehringer Ingelheim to develop a new drug for patients suffering from rare, difficult-to-treat cancers.

"With the success of our second new drug discovery program in oncology, we have made a significant mark in bringing novel treatments to patients. Lupin's MEK Inhibitor program successfully cleared early clinical stages, demonstrating our capabilities in delivering world class innovation," said Nilesh Gupta, managing director of Lupin.

Reference:<https://www.livemint.com/companies/news/lupin-signs-700-million-deal-with-boehringer-ingelheim-to-develop-cancer-drug-1567610208831.html>

## World Pharmacists Day 2019 held on the 25<sup>th</sup> September



"Safe and effective medicines for all" is the theme of this year's World Pharmacists Day. This year promoted pharmacists' crucial role in safeguarding patient safety through improving medicines use and reducing medication errors.

"Pharmacists use their broad knowledge and unique expertise to ensure that people get the best from their medicines. We ensure access to medicines and their appropriate use, improve adherence, coordinate care transitions and so much more. Today, more than ever, pharmacists are charged with the responsibility to ensure that when a patient uses a medicine, it will not cause harm", says FIP President Dominique Jordan.

Reference:<https://www.pharmacist.com/article/world-pharmacists-day-2019-will-promote-safe-and-effective-medicines-all>

## Hyderabad overtakes Bengaluru and Chennai to become India's top life sciences cluster

Hyderabad supplies one-thirds of the world's vaccine demand among children. Genome valley in Hyderabad has suppliers in the form of companies like Bharat Biotech, Shantha Biotechnics, Indian Immunologicals and Biological E, etc. These supply vaccines like Tetanus-Diphtheria (combination), Pentavalent, Japanese Encephalitis, Rotavirus, Typhoid Conjugate and Hepatitis B&C.

The COO of Biological E, N Laxminarayana says "The high-quality innovation here has led to a reverse brain drain. Unlike earlier, expats are more than willing to return to India."

Reference:<https://timesofindia.indiatimes.com/city/hyderabad/vaccines-drive-hyderabad-pharma-boom/articleshow/71266954.cms>



# MOLECULE OF THE MONTH

## CARBARYL

This molecule bears structural resemblance to one of the most prominent neurotransmitters produced in organisms, but this very idea behind it makes it one of the most potential and prominently marketed pesticides worldwide. It classifies under reversible anticholinesterases, which are agents that inhibit choline-esterase enzymes (enzymes that bring about the hydrolysis of the ester group on acetylcholine and bring about the termination of its neurotransmitter action) and protect acetylcholine from hydrolysis. They bring about a cholinergic effect in vivo and potentiate acetylcholine action both in vivo and in vitro by making more acetylcholine available at the receptors.

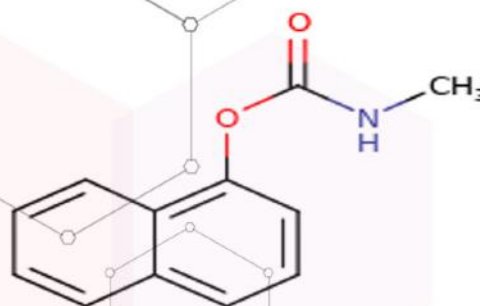
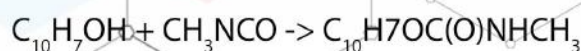
Carbaryl a part of the carbamates family have a non polar tertiary amino group, e.g. physostigmine, rendering it lipid soluble or have a quaternary amino group e.g. neostigmine making it lipid insoluble. Carbamates carbamylate the esteric site of the enzyme. Whereas the acetylated enzyme reacts with water and the esteratic site is freed in a fraction of a millisecond, the carbamylated reacts slowly, keeping the site occupied. The half life of reactivation of carbamylated enzyme is less than that of the synthesis of fresh enzyme protein. It is reversible in action.

The development of the carbamate insecticides has been called a major breakthrough in pesticides. The carbamates do not have the persistence of chlorinated pesticides. Although toxic to insects, carbaryl is detoxified and eliminated rapidly in vertebrates. It is neither concentrated in fat nor secreted in milk, so is favoured for food crops, at least in the US. It is the active ingredient in Carylderm shampoo used to combat head lice

Reference:[K D Tripathi] [7th Edition] Essentials of Medical Pharmacology.<https://www.google.com/search?q=carbar>

until infestation is eliminated. Carbaryl kills both targeted (e.g., malaria-carrying mosquitos) and beneficial insects (e.g., honeybees), as well as crustaceans. Although approved for more than 100 crops in the US, carbaryl is illegal in the United Kingdom, Austria, Denmark, Sweden, Iran, Germany, and Angola.

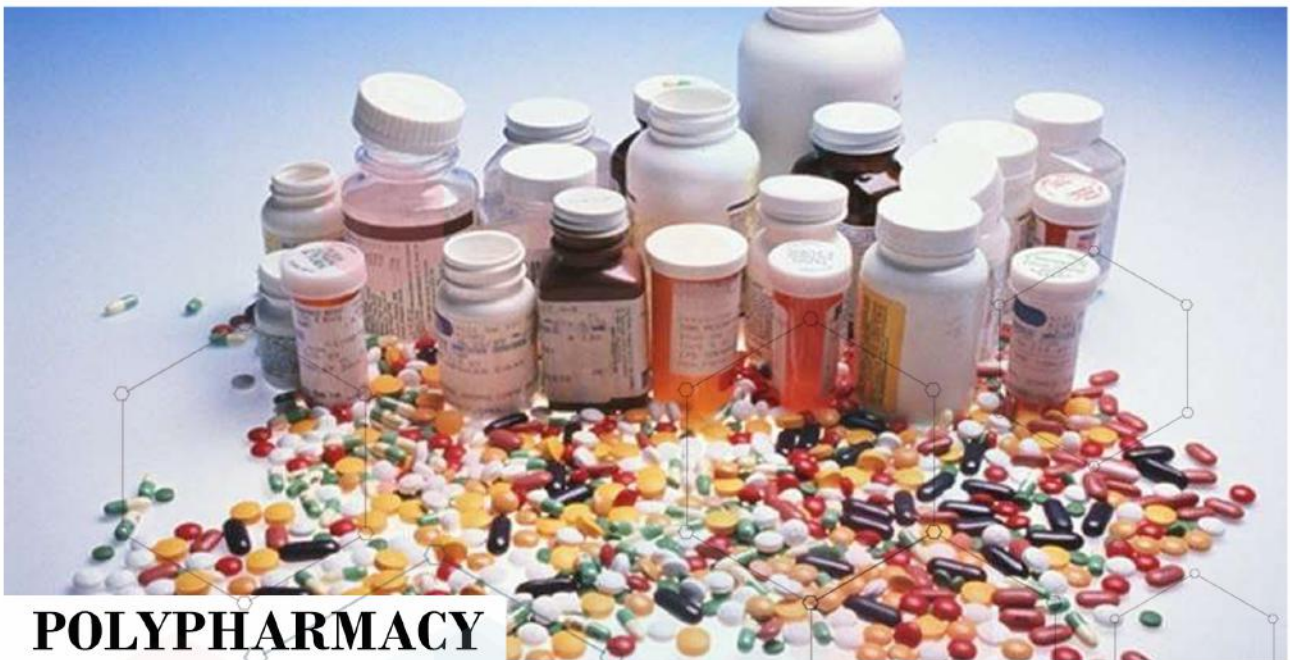
Carbaryl is often inexpensively produced by direct reacting methyl-isocyanate with 1-naphthol.



Alternatively, 1-naphthol can be treated with excess phosgene to produce 1-naphthylchloroformate which is then converted to carbaryl by reaction with methylamine. The former process was carried out in Bhopal. In comparison, the latter synthesis uses exactly the same reagents, but in a different sequence. This procedure avoids the potential hazards of methyl isocyanate. To get a very clear idea on how devastating modern day synthetic remedies are, this particular molecule is a paragon with an imprint on India. The Bhopal gas tragedy circles around a production unit involved in the synthesis of this pesticide which lead to the death of over 16,000(claimed) in Bhopal, India in 1984.

A.Magdum





## POLYPHARMACY

Before going boo-haa over the term used on the top, it is very necessary to understand it, get around it and embracing the roots of its cause. But for starters, let's have the definition...

"Polypharmacy is the concurrent use of multiple medications by a patient." It is commonly amongst the elderly, statistically, over 40% of older adults and 21% adults with intellectual disability are exposed to polypharmacy. In today's times, doctors routinely prescribe five or more drugs to a patient. In the olden days it was believed that a doctor who did so was probably uncertain of the real diagnosis. This maybe partly true since medicine is an art of considering all probable diagnosis and then attempting to treat the treatable.

Polypharmacy is not necessarily ill-advised, but in many instances can lead to negative outcome or poor treatment effective-ness. However, literature over the years use the terms "polypharmacy" and "inappropriate drug use" interchangeably. Health professionals consider it to be a situation that requires monitoring and review to validate whether all the medications are still necessary. The major concern revolving around factors like adverse drug interactions, drug interactions, prescribing cascade and high costs. Polypharmacy is often associated with a decrease in quality of life also including decreased mobility and cognition.

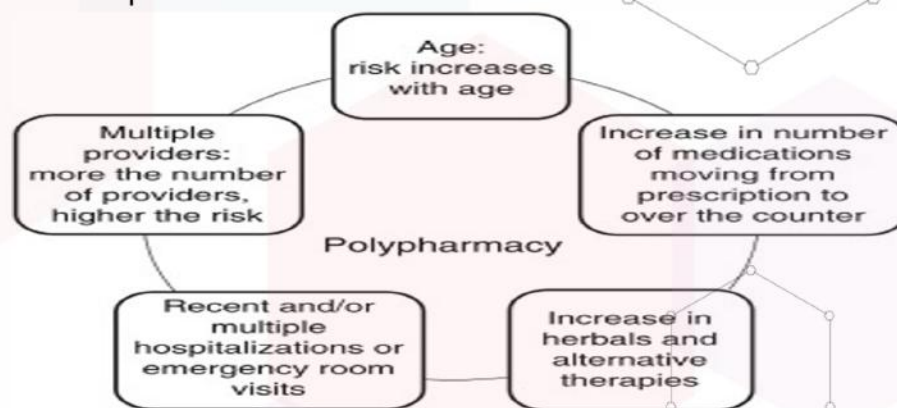
Whether the advantages of polypharmacy over monotherapy outweigh the disadvantages or risks depends upon the particular combination and diagnosis involved in any given case. The use of multiple drugs in a straight forward treatment is not necessarily overmedication. In Pharmacology, it is accepted that the prediction of side effects and clinical effects of a drug combination is possible without studying that combination in test subjects. The effects also vary in individuals due to genome specific pharmacokinetics. As a result, the decision on whether to reduce the medication or "deprescribe" is a not-so-easy matter to deal with. Every drug has potential adverse side-effects. With every drug added, there is an additive risk of side effects. Medication interactions with other substances poses a substantial threat. Patients 65-years- old or older are the largest consumers of prescription and non-prescription medications in the US, and the use of these medications has doubles since the 1990's and continues to rise. Due to this high consumption, there is increased prevalence of medication-associated morbidity and mortality affecting this population.



The most important factors are physiological changes associated with aging, which may include decreased renal elimination, decreased hepatic function, decreased total body water and lean body mass, age related declines in the vision and hearing. Several of these factors lead to the alterations in the pharmacokinetics of medications for elderly patients due to the incomplete absorption, distribution, metabolism, elimination of the drugs taken in.

Because individuals are living longer and accruing chronic diseases, practitioners have a responsibility to prescribe appropriately the many medications available to manage concurrent disease states. The pharmaceutical actions must be balanced with potential risks of multiple medication use.

If the picture is still in a blur, let's put up a simple example of the years and on-going practice of taking antacids in combination with antibiotics. As it goes for antibiotic molecules, the common ones do not differentiate between the good and the bad bacteria. The good bacteria, as we choose to call it as it aids in the digestion process. When these bacteria are missing or are reduced in number, an acid reflux like condition develops due to indigestion. Now, whether these antacids are necessary or not is a very intriguing question while scheming a drug regimen, and cannot be generalized. one suit cannot fit all, tailor-based individualisation is important.



So when you see a large drug list, decide which of the medication is not prescribed appropriately. If there are issues in getting in touch with the prescriber, the roles of the drugs prescribed can be acquired from dispensing professionals like our very own pharmacists and nurses. In the final analysis, it's the doctors' duty to make the patient feel better and comfortable, and prescribe a regimen that will not make them miserable. Although, an intriguing questionnaire with questions, answers on decisions has always had a positive outcome. So why not ask at least the necessary questions.

Reference:<https://www.sciencedirect.com/topics/medicine-and-dentistry/polypharmacy>

- A.Magdum



# New Avenues in Pharmacy Profession

A pharmacist's capabilities are limitless. The depths of the knowledge one can explore in this profession are unmeasured, like the depth of the Pacific Ocean. For a few decades this profession has been sidetracked, like Robin to Batman. This occurred due to lack of professions, designations, or posts of higher responsibility for pharmacists.

In today's day and age, we have myriad facilities which give information from multiples of databases, or even libraries. The chief facility- the internet has led to a quantum leap in the generation of job profiles for pharmacists.

This has increased awareness. As a result, this plethora of choices have left today's pharmacists spoilt for choice! Sure, one could go the conventional route, and opt for the more traditional jobs that demand pharmacists. However, the newer jobs that have been recently generated are often more exciting and provide more opportunities.

Pharmacists are employed and consulted by biotechnological companies that make healthcare appliances. Pharmacists work in tandem with pharmacologists, doctors, and engineers. From the earliest phase of development of the appliance, to the launch and marketing, pharmacists play a major role in the industry.

If law intrigues you, and you are a stickler for rules, regulations, or any kind of order, Regulatory Affairs is the industry for you. Pharmacists can pursue a course in law after graduation. This grooms the pharmacist to be an indispensable package, with the knowledge of drugs in one hand, and laws in the other.

Often, pharmacists graduate and open their own pharmacy. Unfortunately, the reach to patients is not handled well due to lack of communication. A pharmacist can easily convert a simple medicine dispensary to a full-fledged 'healthcare business', by providing a strong link between the doctor and the patient. The pharmacist should be magnanimous and not only dispense medicines, but also give any essential information about drugs, and the relation of drugs to diseases. This serves a dual purpose, boosting not only business, but also educating clueless patients.

Food nowadays is highly processed and unnatural. It is therefore, not as wholesome as food used to be. To supply the demand for nutrition, the nutraceutical industry evolved. Pharmacists can act as consultants for patients and offer diets tailored to meet individual nutritional requirements of patients. The industry is booming at the moment, and showing no signs of slowing down. Pharmacists can also deal in radiopharmaceuticals. They can provide drugs that are tailored according to patient needs. Pharmacists can also leap into the cosmetic industry. Their knowledge of chemicals, colors, preservatives, and formulation of various cosmetics will never be redundant.

All of the above, and plenty more of these avenues are opportunities in this evergreen industry. All a student pursuing pharmacy has to do, is look, research, and take a leap of faith. Happy pharmacists' day!

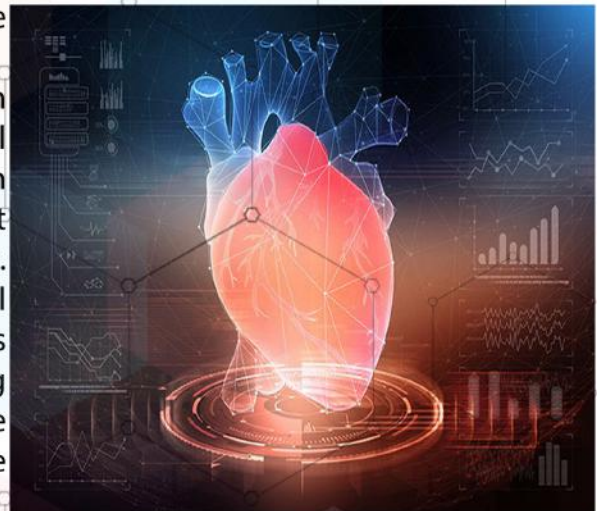
**-S.Bhatia**



# Articles 101

## Artificial Intelligence in Cardiology

Artificial intelligence and machine learning are poised to influence nearly every aspect of the human condition, and cardiology is not an exception to this trend. The promise of artificial intelligence (AI) and machine learning in cardiology is to provide a set of tools to augment and extend the effectiveness of the cardiologist. This is required for several reasons. The clinical introduction of data-rich technologies such as whole-genome-sequencing and streaming mobile device biometrics will soon require cardiologists to interpret and operationalize information from many disparate fields of Biomedicine. Simultaneously, mounting external pressures in medicine are requiring greater operational efficiency from physicians and health care systems. Finally, patients are beginning to demand faster and more personalized care. In short, physicians are being inundated with data requiring more sophisticated interpretation while being expected to perform more efficiently. The solution is machine learning, which can enhance every stage of patient care from research and discovery to diagnosis to selection of therapy. As a result, clinical practice will become more efficient, more convenient, more personalized, and more effective. Furthermore, the future's data will not be collected solely within the health care setting. The proliferation of mobile sensors will allow physicians of the future to monitor, interpret, and respond to additional streams of biomedical data collected remotely and automatically. In this technology corner, we introduce common methods for machine learning, several selected applications in cardiology, and forecast how cardiovascular medicine will incorporate AI in the future.



## HOW DO ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING RELATE TO STATISTICS?

Physicians have long needed to identify, quantify, and interpret relationships among variables to improve patient care. AI and machine learning comprise a variety of methods that allow computers to do just this, by algorithmically learning efficient representations of data. The primary focus of statistics is to conduct inference about sample or population parameters, whereas machine learning focuses on algorithmically representing data structure and making predictions or classifications.



# Articles 101

## WHY DOES CARDIOLOGY NEED ARTIFICIAL INTELLIGENCE?

AI emerged because more familiar algorithms can often be improved on for real-world tasks. Consider the case of logistic regression. When logistic regression is used for other purposes, the assumptions that enable statistical inference may be unrelated to the goal and can hinder the model's performance. In contrast, machine learning algorithms are typically used without making as many assumptions of the underlying data. Although this approach hinders the possibility for traditional statistical inference, it results in algorithms that generally are more accurate for prediction and classification. Thus, cardiovascular medicine can benefit from the incorporation of AI and machine learning.

## FEATURE SELECTION

Feature selection is essential for prediction, and machine learning is particularly useful for it. Consider the example of a physician who wishes to predict whether a patient with congestive heart failure will be readmitted to the hospital within 30 days of the index admission. This is a difficult problem where machine learning techniques have been shown to improve on traditional statistical methods. There are often complex interactions between variables. For example, 1 drug may significantly interact with another drug only if other conditions are present. The quantity and quality of such interactions are difficult to describe using traditional methods. With machine learning, we can capture and use these complex relationships.

## WHAT WILL CARDIOVASCULAR MEDICINE GAIN FROM MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE?

Cardiologists make decisions for patient care from data, and they tend to have access to richer quantitative data on patients compared with many other specialties. Despite some potential pitfalls, it is becoming evident that the best way to make decisions on the basis of data is through the application of techniques drawn from AI. Cardiologists will thus need to incorporate AI and machine learning into the clinic. AI will drive improved patient care because physicians will be able to interpret more data in greater depth than ever before. Advances in unsupervised learning will enable far greater characterization of patients' disorders and ultimately lead to better treatment selection and improved outcomes. AI may obviate much of the tedium of modern-day clinical practice, such as maintaining health records of patients and billing, etc which will likely soon be intelligently automated to a much greater extent. The expert knowledge of pathophysiology and clinical presentation that physicians acquire over their training and career will remain vital.

**-Parth Patel**

Reference: 1. Muse ED, Barrett PM, Steinhubl SR, Topol EJ. Towards a smart medical home. *Lancet* 2017;389:358-363. 2. Steinhubl SR, Muse ED, Topol EJ. The emerging field of mobile health. *Sci Transl Med* 2015;7:283rv3. 3. Shameer K, Badgeley MA, Miotto R, Glicksberg BS, Morgan JW, Dudley JT. Translational bioinformatics in the era of real-time biomedical, health care and wellness data streams. *Briefings in Functional Genomics and Proteomics* 2017;18:105-24.



# TALK THE TALK

## Chetan Mahajan Founder & MD of Verodox Healthcare Pvt. Ltd.

**How does Verodox Healthcare Pvt Ltd stand out amongst other companies that are specialized in just one segment?**

Healthcare segment is substantially vast, moreover, having a wide spectrum of products and services provide an edge to Verodox Healthcare. We, Verodox Healthcare, believe to perform the things perfectly than differently that certainly add value to our organization, ultimately makes us stand apart than others.

**As a budding entrepreneur myself, I must ask. Do you feel more experience is essential before one launches their own company, or should one just take a leap of faith?**

In my opinion, experience is not mandatory to become an entrepreneur however, I would strongly recommend it in order to gain the confidence, that is imperative to initiate a business. Experience would certainly bolster your chances of achieving success but, at the same time, we must consider that it does not guarantees the success, either.



**In your opinion, what skills must a young entrepreneur develop early on to avoid redundancy of any kind?**

As an entrepreneur, I would advise to have self-belief; because unless you have the confidence in yourself, you would not be able to achieve your desired goals.

**Do you feel internships are important for undergraduate students to figure out what they'd like to pursue?**

Yes, it is significantly important, provided those have been completed with commitments & sincerity. It plays a vital role to identify students' interest towards a specific segment. Many students, in general, consider that internships are redundant but paradoxically it provides an opportunity to explore the possible career avenues for the future.

**How do you handle stressful situations?**

To be honest, I am not perfect at this however, I personally feel that, handling the stress is the key here. We have to deal with numerous stressful situations routinely hence, albeit difficult, I always endeavor to keep my mind calm.



**"If we consider the ongoing trend in healthcare industry, then candidates with pharma MBA are preferred over core MBA candidates"**

**Would you rather hire a Pharma MBA over a Core MBA or M Pharm MBA?**

I believe that, MBA is a set of skills that has been offered to a pursuant hence, the candidate who has the knowledge to apply them should be considered for the job. For me, it is of no concern whether a candidate have pursued Pharma MBA or Core MBA. But, if we consider the ongoing trend in healthcare industry, then candidates with Pharma MBA are preferred over Core MBA candidates.

**Was it difficult having to constantly shuffle through Management subjects and Pharmacy subjects while studying M Pharm + MBA?**

Despite the subjects from two different fields, I found it manageable to pursue MBA simultaneously with M Pharmacy. Initially, it was tough to perceive the concepts of management as it was completely new for me but eventually, I managed it successfully after I got familiarized with the subjects.

**What does a typical workday look like?**

This would be tough to answer because every day is different as it brings new challenge and the opportunity to learn something new. While we work for a specific role in a specific department, we have particular responsibilities to handle, but conversely, being an entrepreneur, we have to deal with almost everything, irrespective of the size of organisation.

**-As Told to S.Bhatia**

# Upcoming Events

TECHNOLOGICAL ASSOCIATION'S  
**VORTEX 7.0** THE CHEMFEST

**COSMECURE**

**THE PHARMA**  
series of events

Contact :-  
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TECHNOLOGICAL ASSOCIATION'S  
**VORTEX 7.0** THE CHEMFEST

**IMMUNISIA**

**THE PHARMA**  
series of events

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