# PHARMACIST

# EVALUATING EXAMINATION

# SYLLABUS

## The Pharmacy Council of Mauritius

## Syllabus for Pre-Registration of Pharmacist

2024



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**OUTLINE**

## 1. INTRODUCTION

Pharmacists in Mauritius require a set of essential skills to practice in various domains, including but not limited to:

Community Pharmacy, Wholesale, Government, Industries, Regulatory, Research, Free Port

**Aims:**

The primary aim of the Pharmacist Registration Syllabus is to ensure that aspiring pharmacists are equipped with the knowledge and skills necessary for the diverse practice areas in Mauritius.

**Objectives:**

The syllabus is designed to achieve the following objectives:

To provide comprehensive knowledge in pharmaceutical sciences, regulations, and practices.

To develop practical skills in various pharmacy settings.

To prepare candidates for real-world challenges and decision-making in their professional roles.

To assess candidates' readiness to practice as competent pharmacists.

Structure:

The syllabus consists of specific aspects of pharmacy practice in Mauritius.

**Assessment:**

The assessment of candidates will be carried out by an independent body, such as the Mauritius Examination Syndicate (M.E.S). The assessment will be weighted as follows:

**Written Examinations 70% (70 points out of 100)**

**Viva Voce Examination: 30% (30 points out of 100)**

The viva voce examination will be conducted by a panel of experienced pharmacists who are designated by the Pharmacy Council. This panel will ensure objectivity and impartial evaluation. The panel members must not be related by blood to the candidate or have supervised any part of the candidate's training. A disclosure of interest prior to the exercise is compulsory.

**Passing Mark:**

To successfully complete the Pharmacist Registration Examination, candidates must achieve a minimum of 50 marks out of 100. This passing mark ensures that candidates possess the necessary knowledge and skills to practice pharmacy competently in Mauritius.

This comprehensive syllabus and assessment structure aim to produce highly qualified and competent pharmacists who can effectively serve in the various sectors of the pharmaceutical profession in Mauritius.

## EVALUATING EXAMINATION SYLLABUS

This syllabus has been compiled to guide candidates who are preparing to write the Pharmacist Evaluating Examination. It contains course outline material, in subject areas that are considered important to the foundational knowledge base for preparation for the practice of pharmacy. It is emphasized that the material found within this syllabus gives selected sampling from a variety of sources, and its purpose is to serve as a guide to the curriculum content of current pharmacy education in Mauritius. This information may be helpful in your preparation to write the Pharmacist Evaluating Examination. However, this syllabus should **not** be interpreted to be the blueprint for the construction of any questions for the Pharmacist Evaluating Examination. The examination questions are developed independently of this syllabus.

## VIVA (25 Marks) and Project Presentation (5 Marks)

Both formal education and practice experience prepare you for the Pharmacist Evaluating Examination, Pharmacist Qualifying Examination, and licensure as a pharmacist. In order to determine what additional learning needs you have, prior to taking the examination, you should assess the knowledge and skills that you have already acquired, in comparison with the subject areas evaluated in the Pharmacist Evaluating Examination.

Remember that language proficiency will also affect your performance. Written and verbal language proficiency and communication skills, at a level satisfactory for a health professional, are essential for your preparedness for taking the examinations.

Once you have identified your learning needs, it is your responsibility to find suitable reference sources, materials and/or additional experience to prepare for the Pharmacist Evaluating Examination. 5 Marks will be allotted for a project presentation.

## 2. FORENSICS & ADMINISTRATIVE PHARMACY SCIENCES

### INTRODUCTION

Since the beginning of the modern era in Pharmacy, namely the use of allopathic medicine, a major concern in all countries have been how to protect the population and ensure they get the best out of those molecules.

As professionals in the medical world, we are all aware that medicines have the capacity to treat but sadly also to harm if used inappropriately.

Pharmacies are designated places where medicines are stored and provided to patients under the responsibility of a Health Care Professional, the Pharmacist.

Besides the scientific knowledge required to provide the professional care to the patients, the Pharmacist needs to know the legal aspects of medicines and medicine regulation.

A sound understanding of the major laws governing the practice of pharmacy is crucial for a pre-registered pharmacist.

### CONTENT

The Pharmacy Council of Mauritius requires a pre-registered pharmacist to be fully conversant with:

1. The Pharmacy Act 1983
2. The Dangerous Drugs Act 2000
3. The Pharmacy Council Act 2015
   - Pharmacy Council (Continuing Professional Development) Regulations 2018
   - Pharmacy Council (Code of Practice) Regulations 2021
4. Laws regulating Intellectual Property Rights in Mauritius
5. Code Civil Mauricien
6. Criminal Code 1838

**CONTENTS**

# 1. THE PHARMACY ACT 1983

## 1.1 COURSE DESCRIPTION

The pre-Registered Pharmacist should be well acquainted with the salient features of the Pharmacy Act 1983 and its regulations.

## 1.2 LEARNING OBJECTIVES

The pre-Registration pharmacist is expected to grasp all the relevant sections which would guide his daily performance of duties.

## 1.3 PREREQUISITES

- Already completed a course in Pharmacy and registered with the Pharmacy Council as pre-registered pharmacist
- Performing preregistration training in a private/public pharmacy
- Preparing for the pre-registration exams of the Pharmacy Council

## 1.4 COURSE MATERIALS

The amended Pharmacy Act 1983 and its regulations.

## 1.5 COURSE CONTENT

| Topics | Reference in the Act |
|---|---|
| 1) Understanding the duties and function of the Pharmacy Board | PART Ⅱ – BOARD AND COMMITTEES Sec 3, 4 & 5 |
| 2) The functions of various committees set up by the Pharmacy Board, their composition and their duties:<br>• The Trade and Therapeutics committee<br>• Planning committee<br>• Poisons committee | PART Ⅱ – BOARD AND COMMITTEES Sec 6, 7, 8 & 9 |
| 3) Much emphasis shall be laid to the Pharmaceutical Trade. The Pharmacist is expected to understand clearly the following:<br>• Sale of Pharmaceutical products<br>• Operation of Pharmacy<br>• Death of Pharmacist<br>• Prescription Book<br>• Prescriptions | PART Ⅳ- PHARMACEUTICAL TRADE Sec 17 – 25. |

| | |
|---|---|
| • Dispensing Prescriptions | |
| **Topics** | **Reference in the Act** |
| • Wholesale Pharmacy<br>• Quality of Pharmaceutical Product<br>• Import of drugs | |
| 4) The Pharmacist should understand the sections which relate to poisons specifically import of poisons, sale of poisons, exemptions, keeping of poisons book. | PART Ⅴ - POISONS Sec 26 – 29 |
| 5) The responsibilities of the 'authorised person' shall be extensively discussed with regards to import of Therapeutic substances, standards of therapeutic substances, sale of therapeutic substances, sale of antibiotics and treatment. | PART Ⅵ – THERAPEUTIC SUBSTANCES Sec 31 – 34 |
| 6) Manufacture of pharmaceutical products. The following should be well understood:<br>• Building a factory<br>• Licence for manufacture<br>• supervision of factory<br>• Quality control<br>• Storage<br>• Records and Samples. | PART Ⅶ - MANUFACTURE OF PHARMACEUTICAL PRODUCTS |
| 7) Advertising of Pharmaceutical Products shall be well understood by students. | PART Ⅷ – MISCELLANEOUS Sec 41 |
| 8) Understand their role and duties during an inspection (with inspectors and Police officers)<br>• Objectives of an inspection<br>• Types of inspections<br>• Who are inspectors Pharmacists/ (together with) Police Officers<br>• How you behave during an inspection and what is expected from you<br>• The inspectors – who does what?<br>• Documents / ledgers to be produced<br>• Giving access to inspectors to verify storage locations<br>• How you should assist the inspector in preparing a report on the inspection | PART Ⅷ - MISCELLANEOUS Sec 42, 43 & 45 |

## 2. THE DANGEROUS DRUGS ACT 2000

### 2.1 COURSE DESCRIPTION

Pharmacists are custodians of controlled medicines (psychotropic substances & narcotics) all around the world. In each country, the law differs in the different features of practice. However, the prime concern remains safety of the patients and the population.

In 2000, The Dangerous Drug Act (DDA) was introduced to replace the Psychotropic Substances Act.

The DDA regulates the use of therapeutic substances considered as dangerous drugs and also protects the population on the potential harm of misuse of those medicines as well as illicit substances having psychoactive properties.

### 2.2 AIMS

The aims are to enable pharmacists to:

- Acquire knowledge and understanding of the Dangerous Drugs Act 2000 and subsequent regulations made under this act.
- Learn to apply the different procedures laid down in the act to control the use of dangerous drugs among other stakeholders
  (supplier / prescriber / patient)
- Understand their responsibility as custodian of psychotropic substances and narcotics in a pharmacy.
- Be able to assist, communicate efficiently and provide all information pertaining to dangerous drugs under their responsibility to investigating officers (ADSU/Govt Pharmacists) performing any form of enquiry.
- Develop skills how to superimpose certain parts of the DDA on to the Pharmacy Act 1983 which is important in the exercise of their profession.

### 2.3 LEARNING OBJECTIVES

To enable pre-registered pharmacists to have a thorough understanding of the Dangerous Drugs Act 2000 and its application in the practice of their profession.

### 2.4 COURSE CONTENT

| Topics | Reference in the Act |
|---|---|
| 1) Classification of dangerous drugs | Part Ⅰ, Sec 7 |
| 2) Medical or scientific research or teaching | Part Ⅱ, Sec 7 |
| 3) Licensing of substances and preparations listed in Second and Third Schedules | Part Ⅱ, Sec 8 |
| 4) Limitation of stocks | Part Ⅱ, Sec 10 |

| | |
|---|---|
| 5) Safety measures | Part Ⅱ, Sec 11 |
| 6) Import and export | Part Ⅱ, Sec 12 |
| 7) Drugs in transit | Part Ⅱ, Sec 13 |
| 8) Free trade zones and free ports | Part Ⅱ, Sec 16 |
| 9) Supply of drugs to an authorised person | Part Ⅱ, Sec 17 |
| 10) Prescription of drugs by an authorised person | Part Ⅱ, Sec 18 |
| 11) Supply of drugs on prescription | Part Ⅱ, Sec 19 |
| 12) Possession of drugs | Part Ⅱ, Sec 21 |
| 13) Keeping of registers | Part Ⅱ, Sec 23 |
| 14) Books of medical practitioner or pharmacist | Part Ⅱ, Sec 24 |
| 15) Records | Part Ⅱ, Sec 25 |
| 16) Retention of documents | Part Ⅱ, Sec 26 |
| 17) Provisions applicable to Fourth Schedule substances (precursors) | Part Ⅱ, Sec 27 |
| 18) Inspection | Part Ⅱ, Sec 28 |
| 19) Unlawful use of drugs | Part Ⅲ, Sec 34 |
| 20) Offering or selling for personal consumption | Part Ⅲ, Sec 35 |
| 21) Facilitating or permitting drug offences | Part Ⅲ, Sec 36 |
| 22) Driving while under influence of a dangerous drug | Part Ⅲ, Sec 40 |
| 23) Powers of entry and search | Part Ⅲ, Sec 49 |

## 3. PHARMACY COUNCIL ACT 2015 – (CODE OF PRACTICE) REGULATIONS 2021

### 3.1 COURSE DESCRIPTION

This course provides an overview of the fundamental concepts of the Pharmacy Council (Code of Practice) Regulations 2021.

The Code of Practice is intended to set the standard of professional conduct for all pharmacists. The Health Care Professional should at all times endeavour to act in the interest of promoting public health.

Pharmacists must abide by the laws governing society and their professional practice. In addition, the profession must be self-regulated in professional and ethical conduct to protect the public, maintain the trust of society and uphold the profession.

### 3.2 LEARNING OBJECTIVES

Pre-registered Pharmacists are expected to:

- Accustom themselves with the definitions in the Code of Practice
- Establish a level of understanding regarding different sections of the Code
- Apply the Code in their daily Pharmacy Practice

### 3.3 COURSE CONTENT

| Topics | Reference in the Act |
|---|---|
| 1) All general definitions | Part Ⅰ - Interpretation |
| 2) General roles of the Pharmacist | Part Ⅱ - Introduction |
| 3) Professional responsibility:<br>• Standards of professional practice<br>• Professional relationship with patient or clients<br>• Patient privacy and confidentiality<br>• Pharmacists participate in the enhancement of profession of pharmacy | Part Ⅵ – Professional Responsibility |
| 4) General guidelines in drug administration | Part Ⅴ – Drug administration |
| 5) Delegation of duties<br>• Overall responsibility of the pharmacist<br>• Pharmacy personnel<br>• Supervision and responsibility<br>• Continuing Professional Development (CPD)<br>• Relationship with the pharmaceutical industry<br>• Professional relationship between pharmacist and licensee | Part Ⅵ – Delegation of duties |
| 6) Abuse of power entrusted<br>□ Misuse or abuse of dangerous drugs | Part Ⅶ – Abuse of professional privileges and skills |
| **Topics** | **Reference in the Act** |
| 7) Unprofessional conduct causing harm to the reputation of the profession | Part Ⅷ- Conduct derogatory to reputation of profession |
| 8) Misuse of advertising and other promotional activities | Part Ⅸ – Advertising, canvassing and related professional offences |

## 4. AN INTRODUCTION TO THE INTELLECTUAL PROPERTY RIGHTS

### 4.1 BACKGROUND INFORMATION

Intellectual property rights in Mauritius are protected by the 2019 Industrial Property Act, the 2014 Copyrights Act, and the 2002 Protection against Unfair Practices (Industrial Property Rights) Act.

Mauritius is a member of the World Intellectual Property Organization (WIPO) and party to the Paris and Bern Conventions for the protection of industrial property and the Universal Copyright Convention. Mauritius is a member of the African Regional Intellectual Property Organization (ARIPO).

The Customs Department requires owners or authorized users of patents, industrial designs, collective marks, marks or copyrights to apply in writing to the Director General to suspend clearance of any suspicious goods. Once an application is approved, it remains valid for two years.

### 4.2 COURSE DESCRIPTION

This six-hour course is designed to address the crucial need for pharmacists in Mauritius to familiarize themselves with Intellectual Property Rights (IPR) laws governing the importation and distribution of drugs. Given Mauritius's reliance on imported supplies for drugs, it is imperative for pharmacists to understand the legal framework surrounding IPR. The course offers an overview of the pertinent laws and treaties signed by the Mauritian Government to regulate international trade and protect Intellectual Property Rights.

### 4.3 LEARNING OBJECTIVES

- Understand the general concepts and historical background, and classification of Intellectual Property.
- Recognize the importance of Intellectual Property Rights (IPR) in international trade.
- Acquire knowledge about the various international treaties and protocols signed by the Mauritian Government.
- Gain an introduction to the TRIPS agreement.
- Become familiar with the role of IPR in protecting against counterfeit and substandard drugs.

**4.4 COURSE CONTENT**

| **Topics** |
|---|
| 1) Introduction to Intellectual Property Law: general concepts and historical background, classification of Intellectual Property; |
| 2) The role of international institutions in international trade : WTO, WIPO<br>The different treaties signed by the<br>Mauritian Government |
| 3) Conditions and restrictions for registration under the patents, Industrial Designs and Trademarks Act 2002 |
| 4) Effects of registration – <br>Duration<br>• Licensing and assignment<br>• Infringement of marks<br>• Civil remedies and criminal sanctions 5) Exhaustion |
| 6) TRIPS agreement |
| 7) Case Studies |

## 3. PHARMACY PRACTICE

The idea is that pharmaceutical practice **encompasses everything, which is related to availability of medicines, access and use at the individual and the population levels**. This term encapsulates the research, development, formulation, distribution, access and clinical use of medicines

Good Pharmacy Practice is **the practice of pharmacy that responds to the needs of the people who use the pharmacists' services to provide optimal, evidence-based care**. To support this practice it is essential that there be an established national framework of quality standards and guidelines.

The different types of pharmacy practice

The aim of pharmacy practice

The 4 main elements of Good Pharmacy Practice (GPP) organizes following major roles for pharmacists:

Prepare, obtain, store, secure, distribute, administer, dispense and dispose of medical products.

1. Provide effective medication therapy management.
2. Maintain and improve professional performance.
3. Contribute to improve effectiveness of health care system and public health.

The role of a pharmacist in pharmacy practice

The pharmacy practice in hospital pharmacy

Dispensing and pharmacy practice

How do you maintain a pharmacy?

What are the types of pharmacy?

- Community pharmacy.
- Hospital pharmacy.
- Clinical pharmacy.
- Industrial pharmacy.
- Compounding pharmacy.
- Consulting pharmacy.
  Ambulatory care pharmacy. 
- Regulatory pharmacy.

The community pharmacy practice

The 5 domains of pharmacy

Distributive, drug information, self-care, clinical pharmacy and pharmaceutical care.

## The Pharmacy Practice in the Community Pharmacy

1. **Dispense and ensure the optimal use of medicines prescribed to the patient**

   The candidate must have a thorough knowledge and understanding of the following aspects of dispensing and the provision of medicines to a patient or caregiver including:

   - Prescription reading
   - Pharmacist medication reviews and intervention;
   - Labelling and dispensing of medicines;
   - Calculation of doses for adults, children and infants;
   - Providing emergency supplies of medicines;
   - Counselling on correct use and duration of drugs such as antibiotics
   - Proper disposal of unused drugs
   - Accurately process controlled substance medication orders with regards to legal requirements for recordkeeping, storage, and dispensing at each practicum site.
   - Display effective communication skills during interactions with patients, co-workers, and other health care professionals.
   - Display a cheerful, positive attitude about the practice of pharmacy and a willingness to problem-solve.

**Safe, rational and appropriate use of medicines**

The candidate must have a thorough knowledge of medicines and the effects of medicines to ensure the optimal use of medicines by the patient including:

- Drug interactions
- Side-effects of prescribed medicines;
- Effects of polypharmacy in medicine therapy
- Correct use and storage of prescribed medicines
- Medicines used during pregnancy and breast-feeding
- Medicines used in young children and the elderly
- Medicines used in immunocompromised patients such as diabetic, cancer patients

**2. Essential clinical services including screening and referral services**

The candidate must have a thorough knowledge and understanding of the aspects of treatment, referral, screening and education in primary health care and public health campaigns including:

- Blood pressure testing;
- Cholesterol screening tests;
- Pregnancy testing;
- Diabetes and glucose screening tests
- Urine analysis where appropriate
- First aid measures, where appropriate
- Counselling on healthy life style on nutrition, tobacco smoking, exercise
- Identify a patient in need of vaccination and administer an immunization

## 4. **TOXICOLOGY**

Definition of Toxicology.

Understand and deal with general principles involved in the management of poisoning.

Recognize the clinical symptoms and manage poisoning cases.

Educate public and healthcare professionals in the management of emergency cases.

## 5. Applied Pharmacology

**Case Study**

**Case 1**

A 37-year-old man is looking for a recommendation for treating his runny nose and clear nasal discharge. He says he experiences these symptoms annually around this same time of year, adding that he is also suffering from irritated, itchy eyes and a sore throat. He says the symptoms are so bothersome that they are interrupting his sleep at night and causing daytime drowsiness. He wants something over the counter that will alleviate his congestion and allow him to sleep normally and does not want to see his physician, if possible. He reports no significant medical history. What self-care recommendations can you provide?

**Case 2**

The rash started at 1 year of age and worsened as time went on. The rash was extremely itchy and the child was constantly scratching the affected areas. The child's quality of life was affected as the child often wakes up at night to scratch the affected areas. There were no specific food items that the child avoided or disliked and there were no particular foods that made the rash worse. What will you recommend?

**Case 3**

An 82-year-old male presented with rash, burning, and itching on his knees that had started 4 days after doing gardening. Eye Examination revealed erythematous, oedematous, and scaly plaque lesions on the patient's knees. What will you recommend?

**Case 4**

A 19-year boy was brought to your pharmacy in the morning after passing out during basic training at the Police training Centre Vacoas. He had repeatedly complained of severe weakness, dizziness, and sleepiness during the preceding 4 weeks of training. In a previous episode 3 weeks earlier, he had drowsiness and generalized tiredness, and was brought to the infirmary of the Police Centre, where after IV administration of saline, he was returned to duty with the diagnosis of dehydration. Upon questioning, he reported unquenchable thirst, and the repeated need to urinate. Although he ate all of his rations as well as whatever he could get from his fellow trainees, he had lost 19 pounds. On the last day, he complained of vague abdominal pain, which was worse in the morning admission in your pharmacy. He had vomited

once. He appeared pale, dehydrated with dry mucous membranes, and poor skin turgor. What will you recommend?

**Case 5**

A young chap named Welo. Though he is 24 years of age, he looks like a man of 40 years. Firstly, his friends introduced him to drugs as a means of enjoyment. Gradually he became addicted. He started with 'ganja'. He sometimes changes his drugs to meet his satisfaction level. He changes drugs one after another from 'ganja', 'wine' to 'phensedyl syrup'. Now he is fully addicted to 'phensedyl syrup' for 4 years, and has to take it four times in a day. Without having it he can't do anything. Every day he spends all his money for drug purposes. For the excess money, sometimes he takes loan from friends or steals his own household materials. He collects drugs from the local spots or a particular person. Physically he was anxious looking and irritated. Speech was slowed. What will you recommend?

## 6. APPLIED PHARMACEUTICS

Course Objectives:
To understand the principles of pharmaceutics and their practical applications in the formulation and development of pharmaceutical products.
To gain knowledge of various pharmaceutical dosage forms and drug delivery systems.
To develop skills in the preparation, evaluation, and quality control of pharmaceutical formulations.

Module 1: Pharmaceutical Dosage Forms
Classification of dosage forms
Solid dosage forms: tablets, capsules, powders
Liquid dosage forms: solutions, suspensions, emulsions
Semi-solid dosage forms: ointments, creams, gels
Gaseous dosage forms: aerosols, inhalers
Advantages and disadvantages of each dosage form

Module 2 : Principles of Drug Formulation
Excipients and their roles in formulations
Principles of drug solubility and dissolution
Stability and degradation of pharmaceuticals
Bioavailability and bioequivalence

Module 3: Drug Delivery Systems
Conventional drug delivery systems
Novel drug delivery systems
Controlled release formulations
Transdermal drug delivery
Nanotechnology-based delivery systems
Targeted drug delivery

Module 4: Pharmaceutical Compounding and Manufacturing
Principles of compounding
Good Manufacturing Practices (GMP)
Quality control and quality assurance in manufacturing

Module 5: Evaluation and Quality Control of Pharmaceuticals
Analytical techniques for drug evaluation
Spectroscopy, chromatography, microscopy
Stability testing and shelf-life determination
Microbial testing and sterility assurance

Module 6: Applied Pharmaceutics in Clinical Settings
Role of pharmacists in the clinical application of pharmaceutics
Case studies of pharmaceutical interventions in clinical practice
Patient counseling and education on pharmaceutical products
Adverse drug reactions and drug interactions

## 7.Drug Addiction

**Drug Use Situation in the world and in Mauritius.**

**World**

Drug use continues to be high worldwide. In 2021, 1 in every 17 people aged 15– 64 in the world had used a drug in the past 12 months. The estimated number of users grew from 240 million in 2011 to 296 million in 20v21 (5.8 per cent of the global population aged 15–64). This is a 23 per cent increase, partly due to population growth.

According to the latest report from the United Nations Office on Drugs and Crime (UNODC), in 2021, an estimated 13.2 million people inject drugs globally, while HIV prevalence is estimated to be 12.6% and hepatitis C prevalence 48.5% among this population. However, while 179 of 206 countries report some injecting drug use, 110 countries and territories worldwide have no data on its prevalence.

Cannabis continues to be the most used drug, with an estimated 219 million users (4.3 per cent of the global adult population) in 2021. Use of the drug is increasing and although globally cannabis users are mostly men (about 70 per cent), the gender divide is reducing in some sub regions; women account for 42 per cent of cannabis users in North America.

It is estimated that in 2021, 36 million people had used amphetamines, 22 million had used cocaine and 20 million had used “ecstasy”-type substances in the past year. The proportion of female users is higher in the case of amphetamine-type stimulants (45 per cent of users are women) and nonmedical use of pharmaceuticals (between 45 and 49 per cent of users are

women), whereas the highest share of men is found in users of opiates (75 per cent) and cocaine (73 per cent).

Opioids continue to be the group of substances with the highest contribution to severe drug-related harm, including fatal overdoses. An estimated 60 million people engaged in non-medical opioid use in 2021, 31.5 million of whom used opiates (mainly heroin).

Traffickers continue to innovate and the range of drugs available on the market has started to expand again. After several years of stabilization, the number of new psychoactive substances on the global market increased in 2021.

Of the 618 substances reported to be on the global market in 2021, 87 were newly identified. The number of opioid new psychoactive substances on the market has, however, stabilized, and the number of fentanyl analogues have even declined slightly, following year-on-year increases.

The cumulative number of new psychoactive substances identified over the last
15 years reached 1,165 substances in 2021 and, according to preliminary data, 1,184 substances in 2022.

**Mauritius**

In 2021 the government of Mauritius conducted the first large-scale, nationwide survey to determine the extent and patterns of drug use in Mauritius (excluding Rodrigues). The overall objective of this study was to provide insights into the extent of drug use among people who use illicit non-injection drugs.

Data were collected using the Respondent Driven Sampling (RDS), a probability-based sampling method, to collect numeric data and qualitative methods to collect contextual and descriptive data through focus groups and key informant interviews. For the quantitative survey, 602 People Who Use Drugs (PWUD) were defined as male or female, 18 years or older, living in Mauritius and having used any illicit psychoactive substances (excluding alcohol) in the past months. The results of this survey aim to provide the baseline information needed for the design and implementation of effective prevention, treatment and care services that are evidence-based and targeted to reduce the demand for drugs and prevent the morbidity and mortality attributable to drug use in Mauritius.

**FINDINGS**

The majority of PWUD were between 18 and 24 years old (29%) and mostly males (87%) living in the district of Port Louis (46%). 88% had ever used Cannabis, 63% had ever used Heroin and 61% and 57% had ever used Synthetic
Drugs. This gives an idea of poly drug use in this group of the population. Only 27 % had ever sought treatment for their addictive disorder. 10 % had experienced near overdose.

46 % were incarcerated in the past one year, of whom 41% reported illicit drug use during incarceration.

50% volunteered for urine toxicology and 69% were positive for Cannabis, 32% positive for Opiates and 13 % positive for Amphetamine Types Substances.

**Drug use among females**

Females comprise 13% of PWUD in Mauritius. Most females who use drugs are between 18 and 24 years, have low education (completed primary or less), and are single or cohabitating (74%). In terms of drug use, most females use cannabis (75%), Among females, 39% are using drugs other than cannabis 2 to 3 times a day and just over 60% are using synthetic drugs and/or heroin. Among females who provided a urine toxicology, 81% were found positive for THC and 27% positive for opiates. A slightly higher percentage of female PWUD (33%), compared to males (30%), have ever had treatment for non-injecting drugs.

**Exclusive Cannabis users**

Eleven percent of PWUD use only cannabis, among whom most are male, age between 18 to 24 years (30% among all age groups) (however, the next largest age group was those 50 years or older, 19%), reside in Plaines Wilhems, have completed primary school (however, 14% have tertiary education) and more than 82% are employed.

**Synthetic drug use**

Among those who have ever used synthetic drugs, most are male (90%), 32% are between 18 and 24 years of age, live in Port Louis (61%), have only completed primary school (44%, among all educational levels), are employed (73%), and are single and never married (46%, among all civil statuses). 28% of those who ever used synthetic drugs have ever been arrested. Among those who ever used synthetic drugs and agreed to have a urine toxicology, the majority were positive for THC (57%), followed by opiates (28%) and amphetamines (17%), in their systems.

**Population Size Estimate**

The population size estimation in 2021, based on the successive sampling population size estimation (SS-PSE) method was found to be 55,000 illicit drug users among the age group between 18 and 59 years in Mauritius (excluding Rodrigues) irrespective of the types of drugs used.

Mauritius has faced challenges related to drug abuse, including the abuse of both illicit and prescription drugs. Some key points to consider regarding the drug abuse situation in Mauritius include:

1. **Polydrug Abuse:** Mauritius has seen instances of polydrug abuse, where individuals may use a combination of different substances, including illicit drugs and pharmaceuticals like Pregabalin, benzodiazepines, and Codeine cough mixtures

2. **Heroin Trafficking:** The trafficking and abuse of heroin have been significant concerns. The country has been a transit point for heroin trafficking, given its strategic location in the Indian Ocean.

3. **Government Initiatives:** The government of Mauritius has implemented various initiatives to address drug abuse issues. These include both preventive measures and efforts to tackle drug trafficking and addiction treatment including harm reduction strategies as per recommendations from the Joint UNODC/UNAIDS and WHO programs which includes Needle and Syringe Programs (NSP) and Opioid Agonist Treatment (OAT) with Methadone.

4. **Treatment and Rehabilitation:** Mauritius has rehabilitation centers run by the Civil Society Organizations and programs aimed at psychosocial support and social reintegration, helping individuals overcome drug use disorder. These programs often involve counseling, therapy, and support for individuals and their families.

5. **Legislation and Law Enforcement:** The country has enacted laws and regulations to control the production, trafficking, and abuse of drugs (the Dangerous Act 2000 and the HIV/AIDS Act pf 2006). Law enforcement agencies work to curb drug-related crimes and apprehend those involved in illegal activities while making provisions for treatment and rehabilitation for the users.

6. **International Collaboration:** Given the global nature of the drug trade, Mauritius collaborates with international organizations like UNC, UNAIDS and WHO and Indian Ocean Commission and neighboring countries to combat drug trafficking and address regional drug-related challenges through exchange of intelligence.

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## 8. Communication Skills

The importance of communication skills in pharmacy
Type of communication used in pharmacy
The three elements of communication in pharmacy
The factors affecting communication in pharmacy
Skills do pharmacists need
The main purpose of communication with individuals within pharmacy service Effective communication skill

**Unit 1: Introduction to Communication Skills**

Definition of Communication
Importance of Communication

**Unit 2: Interpersonal Communication**

Basic principles for interpersonal communication
Promoting two-way communication with patients and health care professionals Common barriers to verbal communication and ways to overcome each barrier

**Unit 3: Professional Communication**

Conveying respect for patients
Dealing with patient situations that affect patient-pharmacist communication
Communicating effectively with physicians, nurses, and other pharmacists

**Unit 4: Written and Non-Verbal Communication**

Importance of written communication
Understanding and interpreting non-verbal cues (body language)

**Unit 5: Role-Playing and Practical Implementation**

Role-playing in specific clinical pharmacy work situations
Counseling and providing drug treatment advice to the medical staff and patients

**Unit 6: Evaluation and Feedback**

Self-evaluation and peer feedback
Continuous improvement in communication skills
Proposed Textbook: Communication Skills in Pharmacy Practice by Robert Beardsley

## 9. PRINCIPLE OF PHARMACEUTICAL CARE & TRAINING

## Syllabus for the Principle of Pharmaceutical Care

### 1. Health care education and information

The candidate must have a thorough knowledge of medicines and the effects of medicines to ensure the optimal use of medicines by the patient including,

- Information on the correct storage and supply of drugs, medicines and chemicals;
- Appropriate drug therapy for individual patients;
- Correct use of prescribed and non-prescribed medicines;
- Drug interactions and side-effects of drugs;
- Use of medicines during pregnancy, breast-feeding and the aged;
- Advice on the use of therapeutic goods and devices;
- Counselling and educating patients on the promotion of good health and reduction of incidence of illness;
- Non-drug management, including no treatment and/or referral to other health care professionals;
- Maintaining healthy lifestyles and disease prophylaxis.

### 2. Principles of pharmaceutical care

The candidate must have an understanding of the aspects of the outcomes of therapy and the design, implementation and monitoring of pharmaceutical plans including inter alia:

- Promoting and contributing to rational drug use;
- Designing, implementing and participating in pharmaceutical care plans in drug therapy. Selection and drug usage;
- Monitoring and assessing the drug therapy of patients;

- Evaluating drug usage and optimizing health outcomes;
- Providing drug information to patients, caregivers and other health care professionals to ensure the optional use of medicines;
- Participating in therapeutic and drug utilization review committees.

## 10. BOOK KEEPING DD REGISTER & ANTIBIOTICS REGISTER & POISON REGISTER

According to the Pharmacy Act 1983 and Dangerous Drug Act 2000, every pharmacy is legally bound to have the following registers on the pharmacy premises and available for inspection.

1. **Prescription Book**

(Pharmacy Act Section 20 (1) (2)

20 (1) "Every pharmacist or, in his temporary absence or in the case provided for in section 19 (a) (i), an assistant pharmacist shall keep a Prescription Book in which shall be entered all prescriptions which are dispensed."

20 (2) "The book shall be kept in the pharmacy for a period of 2 years from the date on which the last prescription is entered.

2. **Antibiotic Book**

Pharmacy Act Section 33 (1) (a) (b)

33 (1) "Every person who sells or supplies a therapeutic substance which is an antibiotic shall-

a) keep an Antibiotic Book; and
b) make a record of every sale and supply in the book

(2) The book and every requisition produced under subsection 32 (2) (a) shall be kept by the seller on his premises for a period of 2 years from the date on which the last entry is made."

**3. Dangerous Drug Register**

Dangerous drugs classified as such under the Dangerous Drug Act 2000 as Schedule II and Schedule III shall be recorded in a Dangerous Drug Book/Register.

Refer to Dangerous Drug Act Section 23 and 24 (pages 17-19).

1. The Dangerous Drug Book should be duly signed and stamped by the office of the Registrar, Pharmacy Board prior to recording of entries.
2. Every subsequent Dangerous Drug Register should also be signed as mentioned above and the previous Dangerous Drug Register should be produced at the office of the Registrar, Pharmacy Board before signing and stamping of the new Dangerous Drug Register.
3. The Dangerous Drug Register should be available at the pharmacy premises at all times.
4. The Dangerous Drug Register could be subject to verification by designated persons delegated by the Pharmacy Board (Government Pharmacists) as may deem necessary.
5. Records of sale and receipts of dangerous drugs should be made on the day on which the transaction is effected and updated by the Pharmacist on a daily basis.
6. The following is a format/template of how the Dangerous Drug Register shall contain.

| Date* | Invoice number | Supplier | Quantity received | Signature of Pharmacist | Date* | Name of patient | Prescription Number | Amount dispensed | Balance in stock | Signature of Pharmacist |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |

* The date refers to the date the transaction was effected and not the date when the entry is being made nor the date on the prescription where applicable.

7. The DD entries should be made in chronological order in ink (blue or black) only.
8. Any corrections in the Dangerous Drug Book should be made using a marginal note or footnote initialed and dated by the Pharmacist, giving particulars of the correction.
9. No overwriting should be made in the Dangerous Drug Book.
10. In case a Dangerous Drug item is expired, the corresponding amount should be transferred to the last page of the Dangerous Drug Register titled 'Unserviceable/Expired items'

## Last page: Unserviceable/Expired Items

| Date | Name of Drug | Expiry Date | Amount expired | Transferred from folio/page no. | Signature of Pharmacist | Remarks |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

11. **Expired Dangerous Drug**

(i) The expired dangerous drug should be kept aside within the Dangerous Drug Locker and clearly labelled 'Expired item" to prevent the risk of accidental dispensing to a patient.

(ii) Inform the Registrar, Pharmacy Board through a formal correspondence to the Ministry of Health and Wellness stating the Name of drug, Active Ingredient, Expiry date and Quantity.

(iii) The Registrar, Pharmacy Board will delegate an officer (Government Pharmacist) to verify the expired stock and carry out destruction on the premises in the presence of the Pharmacist.

(iv) A Certificate of destruction stating the name of the product, active ingredient, expiry date, batch number and quantity will be issued to the Pharmacist for record-keeping and a corresponding note made in the Dangerous Drug Register (last page) under Remarks to certify that these expired dangerous drugs have been destroyed and no longer available at the premises.

## 11. DISPOSAL OF PHARMACEUTICAL WASTE & EXPIRED PRODUCT & LOG BOOK

**Disposal of waste**: sorting, carriage, transport, storage, tipping above or underground, incineration and transport operations necessary for its recovery, re-use and recycling according to legal framework in Mauritius.

Local Government Act 2001: Environment Protection (Standards for hazardous wastes).

Pharmaceutical wastes classified as hazardous substances (dangerous, harmful, unsafe).

Expiry Date Monitoring important to be carried out on a regular basis (records/book keeping). Products (stocked) should be re-channeled and their use maximized prior to expiry date.
Two modes of disposing pharmaceutical waste (Guidelines on disposal of pharmaceutical waste)

1. Classical incinerators
2. Land fill (Mare Chicose Land fill station)

Hazard of Pharmaceutical Wastes: Threat of contaminating underground water supply.

WHO recommendations are too costly and not feasible for a small island like Mauritius.

Two Ministries involved for the disposal of pharmaceutical wastes:

1. Ministry of Health and Wellness
2. Ministry of Local Government and Disaster Risk management

Ideally, pharmaceutical wastes to be disposed of by incineration at high temperatures. However, the procedure is costly and high maintenance costs involved.

Refer to Guidelines on Pharmaceutical Wastes

**Proper way of Disposing of Expired Stock (large scale)**

1. Inform the Ministry of Health and Wellness through formal correspondence
2. Follow up to the Ministry of Local Government (special unit of pharmaceutical waste)
3. Elaborate the list of Active Pharmaceutical Ingredients (API's)
4. Recommendation on how to get the expired pharmaceutical products disposed.
5. Incineration at high temperatures in the presence of Ministry of Health representative.

**International Guidelines for disposal of Expired pharmaceutical products (small scale)**

Expired stocks need to be kept separate from the dispensing area to avoid accidental dispensing.

Expired products should not be discarded together with domestic wastes to prevent the risk of diversion or misuse. Sorting of expired products should be done prior to disposal accordingly.

Please refer to table below for disposal of pharmaceutical wastes according to dosage form.

| **Pharmaceutical Items** | **Mare Chicose Landfill** | **Incinerator** | **Down the drain** |
|---|---|---|---|
| Anti-infectives | | ✓ | |
| Ayurvedic/Herbal preparations | ✓ | | |
| Creams/Ointments | | ✓ | |
| Cytotoxics | | ✓ | |
| Dressings | ✓ | ✓ | |
| Drops | | ✓ | Dilute in water |
| Ee/Ear preparations | | | Dilute in water |
| Inhalers | Empty contents of canisters then throw | | |
| Injectable | | ✓ | |
| Oil preparations | In small quantities | ✓ | |
| Oral drug powdered preparations | | | Dissolve in water |
| Shampoos/Hair dyes | ✓ | | |
| Suppositories | | ✓ | |
| Syrups/Liquids/Suspensions | | | Dilute in water |
| Syringes/Surgical items | | ✓ | |
| Tablets/Capsules | | ✓ | Crushed then dissolved in boiling water |
| Vaccines | | ✓ | |

The list is not exhaustive and other pharmaceutical products may be added for further reference.

## Additional information: Guidelines on Pharmaceutical Waste Management from the Ministry of Health and Wellness

## 12. DATA PROTECTION

Data Protection is an important topic for pharmacists, as they have to deal with sensitive personal data of their patients and customers. Data protection legislation sets out the rules and responsibilities for collecting, storing, processing, and disclosing personal data. Pharmacists must comply with these rules and respect the rights and privacy of the individuals whose data they handle. There is no definitive syllabus for data protection for pharmacists, but some of the general topics that could be covered are:
The principles and concepts of data protection, such as personal data, sensitive personal data, data controller, data processor, data subject, consent, and lawful basis.
The main data protection laws and regulations that apply to pharmacists, such as the Data Protection Act 2017, and any other Amendment to the Act and the Pharmacy Council Act 2015 and its regulations…

The professional obligations and ethical standards of pharmacists regarding data protection, such as the Code of Conduct/Ethics, the Guidelines if any on Managing the Closure and Cancellation of the Registration of a Retail Pharmacy
Business,registration/non registration of a pharmacist… and the Draft Guidance on Data Protection for Pharmacists.

The practical aspects of data protection in pharmacy practice, such as safeguarding patient confidentiality, protecting information, disclosing information with or without consent, disclosing information required by law or in the public interest, and managing data breaches and complaints.

Some sources of information and guidance on data protection for pharmacists are: The Data Protection Commission, which is the national authority responsible for enforcing data protection legislation in Mauritius, E.Anquetil Building, Port-Louis. It provides resources, advice, and training on data protection issues.

The Pharmacy Council of Mauritius (PCM), which is the regulator for pharmacists. It sets the standards and guidelines for pharmacy practice, (including data protection). It shall also offer consultations, workshops, and e-learning modules, CPDs on data protection for pharmacists.
Maybe we should have A Practitioner Certificate in Data Protection (PCDP), through a CPD either face to face or distance learning course which covers the key aspects of data protection law and practice. And it will be suitable for anyone who works in a pharmacy with personal data, including the pharmacists and other staffs.

## 13. ANTI-DOPING

The United Nations (UN) through it's drug control body – UN Office on Drugs and Crime (UNODC) has played a significant role in addressing global drug related issues through a series of international drug control conventions. These conventions form the framework for international cooperation in combating the drug trade - the production, trafficking, and abuse of drugs, while promoting public health, and ensuring the welfare of society. The three UN international drug control conventions are:

1. **Single Convention on Narcotic Drugs (1961):**
    - Adopted in 1961, this convention aimed to establish effective control over international and domestic trade in narcotic drugs.
    - Key objectives include limiting the use of narcotics to medical and scientific purposes, preventing diversion into the illicit market, and ensuring an adequate and uninterrupted supply for medical and scientific needs.
    - It classifies drugs into four schedules based on their potential for abuse and medical utility, and it imposes strict control measures for the production, distribution, and use of these substances.
2. **Convention on Psychotropic Substances (1971):**
    - Enacted in 1971, this convention addresses the rising concern of psychotropic substances and their potential for abuse.
    - It categorizes psychotropic substances into four schedules based on their therapeutic value and abuse potential, and it establishes controls on their production, distribution, and use for medical and scientific purposes.
    - The convention provides a framework for international cooperation in controlling psychotropic substances and preventing their diversion into illicit channels.
3. **United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988):**
    - Also known as the Vienna Convention, this treaty was adopted in 1988 to combat the illicit trafficking of drugs.
    - It strengthens measures to control precursor chemicals used in the illicit manufacture of drugs, enhances international cooperation in investigating and prosecuting drug-related offenses, and introduces measures to curb money laundering related to drug trafficking.
    - The convention emphasizes extradition, mutual legal assistance, and the criminalization of money laundering associated with drug trafficking.

These conventions collectively provide a comprehensive framework for international efforts to address the challenges posed by drug production, trafficking, and abuse. Member states that are parties to these conventions commit to adopting measures consistent with the conventions' objectives and cooperate with each other to achieve common goals in the fight against drug related issues.

While these conventions have been instrumental in shaping global drug control policies, it's essential to acknowledge ongoing debates and discussions about the effectiveness and implications of certain aspects of the international drug control regime. Some argue for a more balanced and public health-oriented approach, emphasizing harm reduction and addressing the root causes of drug abuse. Consequently, UNODC continues to explore ways to refine and adapt its approach to global drug control in light of evolving challenges and perspectives.

## The NATIONAL ANTI-DOPING ORGANISATION Mauritius

The National Anti-Doping Organisation Mauritius is an organization with is affiliated with the Ministry Youth Empowerment, Sports and Recreation and subject to the SPORTS ACT 2016.

THE SPORTS (AMENDMENT) BILL (No. XXV of 2018) – amendment to the Sports Act 2016 to bring it in line with the World Anti-Doping Code of the World Anti-Doping Agency (WADA), and to provide for matters related thereto.
NADO Mauritius forms part of the Indian Ocean Regional Anti-Doping Organisation (Indian Ocean RADO) and the World Anti-Doping Agency (WADA).

National Anti-Doping Organisation Board NADO consist of:-

(i) an independent chairperson who shall be a registered medical practitioner, pharmacist or chemist from the public or private sector and having wide knowledge and experience in his respective field, to be appointed by the Minister;

(ii) 4 other members, who shall have expertise in the field of anti-doping, to be appointed by the Minister.

## Objects of NADO

NADO shall promote participation in sports, free from the use of prohibited

(a) substances or other methods intended to artificially enhance performance; and
(b) ensure that Mauritius complies with any anti-doping code of WADA and any other international agreement concerning the prohibition of the use of drugs and doping in sports to which Mauritius is a party.

**Functions of NADO**

NADO shall, in the discharge of its functions –

(c) disseminate information and encourage the development of programs for the education of the community in general and the sporting community on the dangers of doping in sports;
(d) provide information relating to sanctions for positive testing in doping, the use of prohibited substances and violation of any anti-doping rules;
(e) develop and implement educational programmes to discourage the practice of doping and anti-doping rule violations in sports;
(f) set up a centralised independent sample collection and testing programme which may subject any athlete to anti-doping test at short notice, or without notice, both in and out of competition or game;
(g) coordinate all activities relating to procedures and sample collection in accordance with WADA rules;
(h) conduct its activities in accordance with any code issued by WADA;
(i) set up a Therapeutic Use Exemption (TUE) Committee and a Results Management Committee (RMC) in accordance with WADA rules;
(j) impose appropriate sanctions on athletes and persons found guilty of violating an anti-doping rule in accordance with WADA code; and (k) advise the Minister on any matter relating to doping in sports.

**Cooperation with NADO**

(1) (a) Where a National Sports Federation or Multisport Organisation fails to cooperate with NADO in relation to anti-doping rule violations, the National Sports Federation or Multisport Organisation shall be sanctioned in accordance with WADA code.

(b) NADO shall inform every relevant international bodies of the sanction imposed under paragraph (a).

(2) NADO shall inform the athlete or the person found guilty of a violation of an anti-doping rule and the National Sports Federation concerned of the outcome of any anti-doping test effected or of any anti-doping rule violation. The purposes of the World Anti-Doping Code and the World Anti-Doping Program which supports it are:

- To protect the Athletes' fundamental right to participate in doping-free sport and thus promote health, fairness and equality for Athletes worldwide, and

- To ensure harmonized, coordinated and effective anti-doping programs at the international and national level with regard to the prevention of doping, including:

Education— to raise awareness, inform, communicate, to install values, develop life skills and decision-making capability to prevent intentional and unintentional anti-doping rule violations.

Deterrence — to divert potential dopers, through ensuring that robust rules and sanctions are in place and salient for all stakeholders.

Detection — an effective Testing and investigations system not only enhances a deterrent effect, but also is effective in protecting clean Athletes and the spirit of sport by catching those committing anti-doping rule violations, while also helping to disrupt anyone engaged in doping behaviour.

Enforcement — to adjudicate and sanction those found to have committed an anti-doping rule violation.

Rule of law — to ensure that all relevant stakeholders have agreed to submit to the Code and the International Standards, and that all measures taken in application of their anti-doping programs respect the Code, the International Standards, and the principles of proportionality and human rights.

Anti-doping programs seek to protect the health of Athletes and to provide the opportunity for Athletes to pursue human excellence without the Use of Prohibited Substances and Prohibited Methods.

Anti-doping programs seek to maintain the integrity of sport in terms of respect for rules, other competitors, fair competition, a level playing field, and the value of clean sport to the world. The Prohibited List shall identify those Prohibited Substances and Prohibited Methods which are prohibited as doping at all times (both In- Competition and Out-of-Competition) because of their potential to enhance performance in future Competitions or their masking potential, and those substances and methods which are prohibited In-Competition only. Prohibited Substances and Prohibited Methods may be included in the Prohibited List by general category (e.g., anabolic agents) or by specific reference to a particular Substance or Method and is amended and published every year.

WADA shall consider the following criteria in deciding whether to include a substance or method on the Prohibited List:

- A substance or method shall be considered for inclusion on the Prohibited List if WADA, in its sole discretion, determines that the substance or method meets any two of the following three criteria:
- Medical or other scientific evidence, pharmacological effect or experience that the substance or method, alone or in combination with other substances or methods, has the potential to enhance or enhances sport performance;

- Medical or other scientific evidence, pharmacological effect or experience that the Use of the substance or method represents an actual or potential health risk to the Athlete

## 14. CLINICAL TRIAL ACTS

Clinical trials are research studies that test new treatments or ways to prevent, diagnose or manage diseases. Clinical trials are conducted according to a plan, called a protocol, which describes: the types of patients who may enter the study, different schedules of tests and procedures, which drugs are involved, the dosages, or amount of the drugs, the length of the study, this is what the researchers hope to learn from the study. They are essential for advancing medical knowledge and improving health outcomes.

But Pharmacists should know the basics of clinical trials, such as:
The different types of clinical trials, such as intervention, observational, or diagnostic studies, and the phases of clinical trials, from phase I to phase IV, that indicate the level of evidence and safety of a new treatment.

The role and responsibilities of pharmacists in clinical trials, such as ensuring the proper storage, preparation, administration, and disposal of investigational drugs, providing information and education to patients and other health care professionals, monitoring and reporting adverse events, and complying with ethical and regulatory standards. The benefits and risks of participating in clinical trials, such as gaining access to new or better treatments, contributing to scientific discovery, receiving close monitoring and care, but also facing potential side effects, unknown outcomes, or extra costs or procedures.

The process and criteria of enrolling in clinical trials, such as finding a suitable trial, obtaining informed consent, meeting the eligibility requirements, and following the protocol and schedule of the study.

The sources and resources of information about clinical trials, such as the CIDP at Socota, Phoenix have an ethics committee and also at Darne/Wellkin and on reputable websites, databases, or organizations/laboratories that provide reliable and updated information about ongoing or completed clinical trials, their results, and their implications.

These are some of the basics that pharmacists should know about clinical trials. I suggest that in order to learn more, all pre-registered pharmacists/pharmacists should visit the Clinical Trial Act of Mauritius and its' different amendments pertaining to the pharmacy sector. The main part is the pharmacovigilance.

## 15. CONSUMER PROTECTION LAW

Consumer protection is the practice of safeguarding consumers from unfair or harmful business practices, such as fraud, deception, or defective products. Pharmacists, as

providers of health products and services, have a duty to protect the rights and interests of their consumers. Some of the basics that we as pharmacists should know about consumer protection are:

The legal framework and regulations that apply to their profession and products, such as the Consumer Protection Act of 1991 in Mauritius.

The ethical principles and standards that guide their practice, such as the Code of Ethics for Pharmacists and wish to point out that Pharmacy Technicians, entrepreneurs, and Big Companies are not signatory to the Code of Ethics we have in the country.

The consumer rights and responsibilities that they must respect and uphold, such as the right to information, choice, safety, redress, education, and representation, and the responsibility to use products and services appropriately, report problems or complaints, and seek professional advice when needed.

The consumer problems and challenges that they may encounter or prevent, such as unawareness and authority-dependence of consumers, impact of excessive advertisement and mass communication, lack of legal knowledge and ignorance of entrepreneurs, limitations of authorities and responding organizations, and the gap in consumer protection law and regulations.

The consumer protection mechanisms and strategies that they can use or support, such as pre-marketing and post-marketing control, consumer empowerment, quality assurance, risk management, pharmacovigilance, adverse drug reaction reporting, medication error prevention, drug information and education, and consumer feedback and satisfaction.

## 16. HOSPITAL PHARMACY MANAGEMENT

**Syllabus for the Pharmacy Practice at the Hospital**

1. **Dispense and ensure the optimal use of medicines prescribed to the patient**
   The candidate must have a thorough knowledge and understanding of the following aspects of dispensing and the provision of medicines to a patient or caregiver including:

   - Review prescriptions from doctors to ensure accuracy, to ascertain the needed dosage especially for Geriatics, Paediatrics, Renal patients. Daily checking of ward boxes prior delivery of drugs to wards and units. Accurately process controlled substance medication orders with regards to legal requirements for recordkeeping, storage, and dispensing of same.

   - Keep file records such as prescriptions (controlled and non-controlled items) and Dangerous drug pads for auditing purposes

   - Counselling on correct use and duration of drugs such as antibiotics, dangerous drugs, biologicals

   - Display effective communication skills during interactions with patients, co-workers, and other health care professionals.

   - Display a cheerful, positive attitude about the practice of pharmacy and a willingness to problem-solve.

   - working in multidisciplinary teams with other health professionals

2. **Safe, rational and appropriate use of medicines**

   The candidate must have a thorough knowledge of medicines and the effects of medicines to ensure the optimal use of medicines by the patient including:

- Drug interactions
- Side-effects of prescribed medicines;
- Effects of polypharmacy in medicine therapy;
- Correct use and storage of prescribed medicines;
- Medicines used during pregnancy and breast-feeding;
- Medicines used in young children and the elderly.
- Medicines used in immunocompromised patients such as diabetic, cancer patients

3. **Proper of dormant drugs and those with near expiry dates at the Regional Hospital and the Primary Health Care**

- Monitoring the expiry dates of all Pharmaceutical items on a monthly basis and send circulars to prescribers to optimize use.
- Monitoring of dormant drugs on a monthly basis and liaise with prescribers to optimize use
- Disposal of expired drugs on a quarterly basis as per the established guidelines of waste management

4. **Proper monitoring of drugs to prevent out of stock condition**

- Accurately process controlled substance medication orders with regards to legal requirements for recordkeeping, storage, and dispensing. Conducting regular inventory stock taking of Pharmaceutical and replenish as and when required to keep a butter stock for any emergency. Providing emergency supplies of medicines for patients in critical conditions in ICUs, procuring on Imprest account.
- Collaborate with Pharmaceutical wholesale distributors to buy the proper medications in the desired quantity at the right price on the local market.
- Be abreast with the Electronic Inventory System
- Preparing the Annual Estimates of pharmaceutical drugs in collaboration with the prescribers.

5. **Training of Pharmacy Students**

- Supervision and monitoring of work assigned on site of work
- Tutoring pharmacy students at the Mauritius Institute of Health Conducting examination
- Regular meeting to maintain good communication skills
- Developing good working environment and team spirit

6. **Managing the Pharmacy at the Regional Hospital and the Primary Health Care**

- Monitoring the attendance and punctuality of Pharmacy staff
- Maintaining discipline at work, proper dressing codes…
- Organising the work at the Hospital pharmacy and the Primary Health Care
- Conducting regular meeting with the Pharmacy Technical cadres ensuring that work is being done effectively
- Creating a conducing working environment and a good team spirit among the technical grades

7. **Involving in the decision making plan at Hospital and Headquarters**

- Attending monthly management meeting with the Regional Health Director
- Attending the Drug and Therapeutic Committee regarding purchase of non-listed drugs
- Participating in policy-making committees on topics such as antibiotics, hospital infections and drug selection.
- Participating in drug review committees, Committee of Needs at the Ministry's level
- Answering to queries and complaints

8. **Inspectorate duties in the Community Pharmacy/Seaport/Airport/Post office**

- Understand inspector roles and responsibilities in different settings.
- Learn regulations and compliance standards for community pharmacies, seaports, airports, and post offices.

Modules Overview:

<u>Introduction to Inspectorate Duties</u>

Overview of inspector roles, legal framework, and ethical considerations.

Inspectorate Duties in Community Pharmacies
Key regulations, inspection procedures, common issues, and reporting.

<u>Inspectorate Duties at Seaports</u>

Compliance standards, inspection of pharmaceutical shipments, and collaboration with customs.

Inspectorate Duties at Airports

Regulations, cargo inspection, passenger declaration verification, and security collaboration.

Inspectorate Duties at Post Offices

Postal regulations, inspection of mailed pharmaceuticals, and collaboration with postal and customs officials.

Recommended Reading and Resources:
Relevant Acts and legislation
International Maritime Organization (IMO) guidelines
International Civil Aviation Organization (ICAO) guidelines

## 17. REGULATORY AFFAIRS

**Registration of Pharmaceutical Products to be marketed on the Mauritian territory**

- Evaluation of mini dossier to be submitted to the TTC and Pharmacy Board
- Variations to the registration dossier

**Import of pharmaceuticals (Dangerous Drugs and Non Dangerous Drugs)**

**Inspection of Private pharmacies (routine and non-routine + Police requesting assistance)**

**Inspection at Ports of Entry (Seaport, Airport, Parcel Post)**

**Special requests for import of drugs**

## 18. MANAGEMENT OF A WHOLESALE PHARMACY:

1. **Opening of a wholesale Pharmacy:**
   Please refer to updated to the Pharmacy Board guidelines to open a wholesale Pharmacy

2. **Registration of Pharmaceutical products:**
   - A common technical document (CTD) for each product is required to be submitted for registration to the Pharmacy Board.

   - A CTD is a set of specifications for an application dossier for the registration of Medicines and designed to be used across Europe, Japan and the United States and beyond.

3. **Registration of Health supplements:**
   - A full composition for each product along with its recommended dosages have to be submitted for registration to the health supplement committee.
   - Applicants need to refer to the list of prohibited substances and ensure these products are not present in their product formulation. A commercial sample pack for each product is mandatory  Therapeutic claims are prohibited on the product primary and secondary packaging

4. **Registration of cosmetics, medical consumables and other health related products:**
   - A full composition/specification of the product have to be submitted
   - Applicants need to refer to the list of prohibited substances and ensure these products are not present in their product formulation. Accordingly, a one-off import authorisation will be given to the importer.

5. **Logistics and supply:**
   - Products shipped by airfreight or sea freight must adhere strictly to the storage and temperature conditions of the concerned product. Any deviation in the product physical condition or outside the temperature range may be considered not fit for clearance at customs and ultimately destroyed.
   - All commercial invoices for any imported product must be approved by the pharmacy board and cleared under the supervision of a government pharmacist at customs.
   - Deliveries to Pharmacies, Hospitals, Pharmacies and other health institutions must be carried out in an appropriate temperature controlled delivery vehicle.

6. **Import/supply of Dangerous/controlled drugs**

- All Dangerous or controlled substances must be registered prior to import – please refer to registration guidelines of the Pharmacy Board. All Dangerous drugs or controlled drugs are allocated an import quota by the pharmacy board
- All imports of dangerous or controlled items must be cleared from customs under the supervision of the wholesale pharmacist and the government pharmacist.
- A daily sales return of all dangerous or controlled products imported and sold to pharmacies and medical clinics must be submitted online to the customs department of the Mauritius revenue authority (MRA).

## 19. PRESCRIPTION PROCESSING & PRODUCT PREPARATION

Processing a prescription means taking all the necessary steps that should be taken to evaluate a prescription, verify its medical importance, benefits or the side effects, to guide the patient about the specific dosage and possible side effects properly.

Definition of a prescription in process

1. The prescribing process
2. The process in preparing a prescription for a patient
3. The first step in processing a prescription
4. How prescriptions are processed at the pharmacy?

What is a preparation in retail pharmacy?

1. The types of pharmaceutical preparations in retail pharmacy
2. The role of a pharmacist in preparation in retail pharmacy
3. Pharmaceutical preparation manufacturing

## 20. MEDICATION /PATIENT SAFETY PRACTICES

**Patient Safety Practices**

- Preventing harm and infection control.
- Hand washing.
- Hand hygiene.
- Clean patients.
- Waste management.
- Cleaning.
- Patient identification.
- Marking the surgical site.

**The 7 steps of patient safety**

- Build a safety culture.
- Lead and support your staff.
- Integrate your risk management activity.
- Promote reporting.
- Involve and communicate with patients and the public.
- Learn and share safety lessons.
- Implement solutions to prevent harm.

**The 5 steps to improving patient safety**

- Maintain Patient Room Cleanliness.
- Practice Proper Hand Hygiene.
- Develop Optimized Discharge Process.
- Keep High-Risk Patients Safer With Trained Sitters.
- Apply UV-C Technology Creatively.

**What are the pillars of patient safety?**

1. structures and systems;
2. culture measures and interventions;
3. team training and team interventions;
4. identification and mitigation of risks and hazards;
5. disclosure;

**The first step to ensure patient safety**

The first step to ensuring patient safety is to **identify and understand the potential sources of error, harm, or adverse events that may affect your patients**.
These could include medication errors, infections, falls, diagnostic errors, communication breakdowns, or system failures.

Pharmacovigilance-Definition

Reporting to the Pharmacovigilance Unit regarding Adverse Drug Reaction

## 21. LITERATURE EVALUATION / RESEARCH METHODS / EVIDENCE-BASED DECISION MAKING (including PHARMACOEPIDEMIOLOGY)

**Epidemiology Syllabus**

1. **Epidemiology**
    a. What is epidemiology?
    b. Objectives of epidemiology
    c. Explain causation.
    d. Explain association.

2. **Health indicators**
    a. Measures of disease frequency
    b. Ratio
    c. Proportion
    d. Rate
    e. Incidence
    f. Prevalence

## Public Health Syllabus

1. **What is Public Health**
    a. Old Public Health
    b. New Public Health
    c. One-Health Approach
    d. Major achievements in the past 100 years

2. **Burden of Disease**

    a. Global Burden of Disease
    b. Types of composite summary measures (Healthy Life Year (HeaLY) and Disability Adjusted Life Years (DALYs)]
    c. Burden of disease in Mauritius

3. **Communicable Disease**

    a. What are communicable diseases?
    b. Transmission routes
    c. Incubation, latent and infectivity times

4. **Non-Communicable Disease**

    a. Definition
    b. The demographic and epidemiological transition
    c. Chronic Disease
    d. Mental Health and Substance Abuse
    e. Tobacco Use
    f. Poor Nutrition
    g. The Burden of Non-Communicable Disease in Mauritius

## 22. SPECIAL POPULATIONS

Unique pharmacotherapeutic considerations for special populations including:

- Neonates
- Pediatrics
- Geriatrics
- Pregnant women
- Lactating women

## 23. INFECTION, PREVENTION AND CONTROL

Infection prevention and control (IPC) is a practical, evidence-based approach preventing patients and health workers from being harmed by avoidable infections.

**5 basic principles for infection control**

1. Hand Hygiene. Hand hygiene is the most important measure to prevent the spread of infections among patients Respiratory Hygiene Sharps Safety.
2. Safe Injection Practices.
3. Sterilization and Disinfection of Patient-Care Items and Devices.
4. Environmental Infection Prevention and Control.
5. The 10 principles of infection prevention

**There are the elements of Standard Infection Control Precautions (SICPs):**

1. Patient placement/assessment of infection risk.
2. Hand hygiene.
3. Respiratory and cough hygiene.
4. Personal protective equipment.
5. Safe management of the care environment.
6. Safe management of care equipment.
7. Safe management of healthcare linen.
8. Safe management of blood and body fluids.
9. Prevent and control infection

**These measures include:**

Hand Washing.

Infection control standard, contact, droplet and airborne precautions.

Procedures for decontamination of persons and disinfection of equipment and the environment.

Quarantine of contacts (if necessary)

Prophylaxis of exposed individuals.

Control of the vectors of infection.

## 24. RADIOPHARMACEUTICAL

Definition and types (diagnostic and therapeutic) of radiopharmaceuticals
Preparation and quality control of radiopharmaceuticals
Theragnostic radiopharmaceuticals
Radiopharmacology
The role of a radiopharmacist

## 25. VETERINARY PRODUCTS

Veterinary products are important tools in the prevention and control of animal diseases. The definition of veterinary products may vary from one country to another; for WOAH (*World Organisation for Animal Health)* purposes, they include **vaccines, veterinary medicines, such as antimicrobial agents, and diagnostic kits**.

Examples of veterinary drugs:-

**Gentamicin, erythromycin, penicillin, ciprofloxacin, tetracycline, virginiamycin, florfenicol, sulfonamides, and colistin** are the examples of antimicrobials utilized in these treatments.

**What are the different types of animal health products? Animal Health**

- Antibiotics.
- Immunostimulants.
- Injectable.
- Oral Supplements.
- Udder Care.
- Vaccines.
- Vitamin & Minerals.
- Wound Care.

**What is veterinary medicine used for?**

Veterinary medicines are used **to improve or maintain the health of animal species** regardless of whether these are intended for food production.

**What are the most popular veterinary drugs?**

- Ketoprofen - used most frequently as a fever reducer. Firocoxib - COX-2 inhibitor.
- Deracoxib - COX-2 inhibitor
- Flunixin Meglumine used mostly in horses.
- Phenylbutazone used mostly in horses.
- Prednisolone

## 26. PRESCRIPTION READING

**Be aware of:** Dangerous Drugs (Prescribed Forms) (Amendment) Regulations 2022

The basic of prescription reading

The doctor's professional information, such as her name, address, and phone number, will be at the top of the form. In the upper section of the prescription sheet, there will be a place for your name, your age or birth date, your address, and the date the prescription is given to you.

**Medication: The Rx Details**

- PO means orally.
- QD means once a day.
- BID means twice a day.
- QHS means before bed.
- Q4H means every 4 hours.
- QOD means every other day.
- PRN means as needed.
- a.c. means before a meal.

**The 7 parts of a prescription**

**For a pharmacist to dispense a controlled substance, the prescription must include specific information to be considered valid:**

- Date of issue.
- Patient's name and address.
- Patient's date of birth.
- Clinician name, address.
- Drug name.
- Drug strength.
- Dosage form.

**The importance of prescription reading**

- The label on your prescription medication **tells you how to correctly take the medicine your healthcare provider has recommended for your treatment plan**. It's very important to understand the information on this label. By taking your medication correctly, you will have the best treatment results.
- Quantity prescribed.

**The 5 elements of prescription**

Most health care professionals, know the “five rights” of medication use: **the right patient, the right drug, the right time, the right dose, and the right route**—all of which are generally regarded as a standard for safe medication practices.

**What does Rx mean in pharmacy?**

Rx: **A medical prescription**. The symbol "Rx" is usually said to stand for the Latin word "recipe" meaning "to take." It is customarily part of the superscription (heading) of a prescription.

**The 6 important details that must be on the prescription**

Every drug prescription consists of seven parts: the prescriber's information, the patient's information, the recipe (the medication, or Rx), the signature (the patient instructions or Sig), the dispensing instructions (how much medication to be dispensed to the patient or Disp), the number of refills (or Rf),

**The prescription format**

**Patient's name and another identifier, usually date of birth.** Medication and strength, amount to be taken, route by which it is to be taken, and frequency. Amount to be given at the pharmacy and number of refills. Signature and physician identifiers like Reg. number.

**The errors in prescription**

Errors in prescribing can occur **when an incorrect drug or dose is selected, or when a regimen is too complex**. When prescriptions are transmitted orally, sound-alike names may cause error. Similarly, drugs with similar-looking names can be incorrectly dispensed when prescriptions are handwritten.

**Medication errors**

Medication errors can occur in deciding which medicine and dosage regimen to use (prescribing faults—irrational, inappropriate, and ineffective prescribing, under prescribing, overprescribing); writing the prescription (prescription errors); manufacturing the formulation (wrong strength, contaminants, or adulterants)

**The Question Paper shall consist of 70 questions carrying 70 marks and are based on the following topics namely: -**

(1) The Pharmacy Laws……**30marks**

a. The Pharmacy Act 1983
b. The Dangerous Drugs Act 2000
c. The Pharmacy Council Act 2015
d. Pharmacy Council (Continuing Professional Development) Regulations 2018
e. Pharmacy Council (Code of Practice) Regulations 2021
f. Laws regulating Intellectual Property Rights in Mauritius

**(2)** The Pharmacy Practice……**30marks**

a. Bookkeeping DD register & Antibiotics register & Poison register
b. Communication Skills
c. PRESCRIPTION PROCESSING AND PRODUCT PREPARATION
d. MEDICATION / PATIENT SAFETY PRACTICES
e. PRESCRIPTION READING
f. VETERINARY PRODUCTS
g. Wholesale Pharmacy Management
h. Disposal of Pharmaceutical waste & expired product & Log Book
i. Hospital Pharmacy management
j. Regulatory Affairs
k. Infection, Prevention and Control
l. Case study related to applied Pharmacology And Pathology
m. Applied Pharmaceutics

(3) Miscellaneous……**10marks**

a. Toxicology
b. Drug Addiction
c. Principle of Pharmaceutical Care & training
d. Data protection Act
e. Anti-Doping laws
f. Clinical trial acts
g. Consumer protection laws
h. LITERATURE EVALUATION / RESEARCH METHODS / EVIDENCE-BASED DECISION-MAKING (including PHARMACOEPIDEMIOLOGY)
i. SPECIAL POPULATIONS
j. RADIOPHARMACEUTICAL