

# To Establish the Forensic Toxicology Laboratory and Poison Information Centre in the Department of Forensic Medicine & Toxicology at a Tertiary Care Centre

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## INTRODUCTION

Poisoning is a significant global public health problem. According to the World Health Organisation (WHO), in 2004, an estimated 0.35million people died worldwide from unintentional poisoning. Nearly a million people die annually as a result of suicide, and chemicals (poisons) account for a good number of deaths due to poisoning. It is estimated that deliberate ingestion of agrochemicals causes 370,000 deaths each year. In India, poisoning is more common and is also one of the significant causes of death, intentional or otherwise. In developing countries, pesticides are frequently used for suicidal poisoning. Increased mortality and morbidity could be due to a lack of access to information for the nearest relatives, a lack of a toxicological laboratory for clinical purposes, first-aid measures, attending physicians treating the patients, and awareness about prevention related to exposure and the management of different poisoning cases. A Toxicology Lab & Poison Information Centre (PIC) can play a vital role in the prevention and management of poisoning cases by providing preliminary and basic information to the general public and healthcare professionals.

The Analytical Toxicology Lab and the Poison Information Centre (PCC), also known as the poison control centre, is a specialised unit that provides immediate information on early diagnosis, treatment, prevention of exposure, and management of poisoning cases presenting to the hospital, through well-trained poison information specialists. Poison information (PI) is a specialised area of drug information that covers the toxic effects of chemicals, hazardous material spills, household products, overdose of therapeutic medicines, plants (including mushrooms), and animal toxins from bites by snakes, spiders, and other venomous creatures. Poison information and lab services primarily focus on providing timely and relevant poisoning management information tailored to the enquirer's needs. The poison information service also deals with risk assessment, diagnosis, management, and prevention of exposure to any poison in patients of all ages, regardless of the type (intentional or accidental) and route of exposure. The primary aim of PIC is to reduce morbidity and mortality due to poisoning and improve patients' health-related quality of life. PICs help reduce the cost of poisoning treatment for patients and public healthcare facilities by preventing unnecessary visits, admissions, and prolonged hospitalisations.

## CURRENT SCENARIO

To date, there are only four WHO-recognised centres in India. Additionally, there are a few other centres that provide poison information through clinical pharmacy services. The first National Poison Information Centre was established in February 1995 at the All India Institute of Medical Sciences (AIIMS), New Delhi. Other centres were subsequently established at the National Institute of Occupational Health, Ahmedabad; Government General Hospital, Chennai; and the Forensic Medicine Department of Amrita Institute of Medical Sciences and Research, Cochin. Other centres are also in the process of establishing PICs only or Toxicology Labs alone. Considering the incidence rate of poisoning cases in India, these centres may not be able to meet the demand for poison information, particularly in the eastern and north-eastern sectors of India. Hence, there is a need for well-equipped laboratories and poison information centres with well-trained personnel in this area of our country.

This will be an asset and integral part of the institution, marking the first of its kind in this part of India. The required information about poisoning will be provided to the general public and also to healthcare professionals throughout India.

## Objectives

- Provision of poison information services
- Outline the Management protocol of poisoning cases
- Conducting education and training of healthcare professionals and facilitating advanced research in the field of toxicology.
- Conducting education and awareness programs for the public regarding the prevention of accidental poisoning
- To do screening tests to detect poisons consumed by the patients coming to the hospital.
- To provide qualitative and quantitative analysis of various common poisons
- To assess the morbidity and mortality due to chronic poisoning exposure

## Implementation and Management Plan

- To have a fully functioning Poison Control Centre and Laboratory services
- To reduce the morbidity and mortality among poisoning cases.

- To reduce referral costs.

### Activities and Work Plan

Standardised recording of enquiries, including those relating to clinical cases, will allow the centre to

- Maintain its own clinical and other data registry.
- Attend calls 24 hours a day from all parts of the state & other parts of our country.
- Providing information regarding the diagnosis and treatment of poisoning cases.
- Support epidemiological and statistical studies.
- Validate new techniques of patient management.
- Provide data for scientific reports.
- Exchange information with other poison information centres.
- Contribute to the fund of knowledge on human toxicology.

### Procedure of the Functioning of Pic

When a call is received in the poison information centre, the caller has to provide the following basic information-

- Name of Caller
- Relationship to the victim
- Address
- Patient details
- History of poisoning
- Toxic substance
- Signs & Symptoms

Scientist /Faculty refer to the toxicology database & make the differential diagnosis.

The toxidromes are compared/corroborated with the database, reference manuals/books & journals]

### Information Given

- The possible diagnosis
- How to proceed for emergency management
- The possible antidote
- The source of the antidote, if possible

When a patient presents to an emergency department with a history of poisoning, samples such as vomitus, blood, and urine can be taken and analysed at our toxicology lab.

- We will provide any active patient management
- Antidote will be supplied.
- The Chemical Analysis, in the form of reports, will be provided and can be used for any legal purpose.

### Requirements

#### Workforce

- Faculty in charge
- Assistant Faculty in charge

- Toxicologist
- Receptionist
- LDC
- Data entry operator
- Lab Attendants

#### Equipment

- Major Instruments for Analysis
- Small equipment & Glassware
- Chemicals

### Infrastructure

- Space – 2 blocks of 900 sq ft/ or one block, also for the initial phase. Area will be arranged from the designated area of the Department of Forensic Medicine and Toxicology/hospital premises & Civil & Electrical construction.
- Expendable equipment: items of equipment, supplies, or training materials are
- Telephones -3 (1 Land line with toll-free number, 1 Intercom & 1 Smart phone)
- Desktop, UPS with a printer, Laptop-1
- Internet: Fast and reliable communication
- Projector & Screen: for education and training.
- Refrigerator-1
- Lockable cabinets for storing pharmaceutical agents
- Cloud Storage: Automated systems may replace manual storage, retrieval, and processing systems.
- Printer-scanner-photocopy-fax [4in1]-1
- Toxicology database (software) MICROMEDEX 2.0 (a database of more than 8,00,000 household products, chemicals, and medications)
- Tables, Chairs,
- Computer table-1

The total expected cost of establishing a toxicology laboratory depends on several factors, including the phase-wise approach, basic equipment, advanced techniques, and the number of samples to be processed. We can start with 1-2 crores or even less.

### CONCLUSION

There is a need for well-equipped laboratories and poison information centres with well-trained personnel in all states of our country, or at least at the main tertiary centres. This will be an asset and integral part of the institution. The required information about poisoning will be provided to the general public and also to healthcare professionals throughout India. This lab will provide qualitative and quantitative analysis of various common poisons promptly and help reduce the morbidity and mortality due to poisoning exposure

