

# Indian Society of Critical Care Medicine Position Statement: Approach to a Patient with Poisoning in the Emergency Room and Intensive Care Unit

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## ABSTRACT

Poisoning and its aftermath are globally observed and acknowledged concerns. India has a large burden of “self-harm/suicides” with 12.4/ per 100,000 population committing suicide. Consumption of poisonous substances is the second most common mode of self-harm in India. Patients present to both public and private institutions in a critically ill state. The Indian Society of Critical Care Medicine (ISCCM) and Indian College of Critical Care Medicine (ICCCM) decided to address common and contentious issues related to poisoning by developing a position statement that is expected to be appropriate in the Indian scenario by the constitution of an “expert group” to provide a “set of statements” aimed at addressing the common issues faced by intensivists in their practice in managing such patients.

The structured approach, framework, and process adopted in developing the position statement on the approach to poisoning have been detailed in this statement. The formation of an expert advisory panel was followed by a literature search, and multiple sessions of consensus-building exercises to reach the current statement presented below. The statement consists of relevant questions with possible answers thereof. Each answer was further weighed against the data and evidence available in the literature. Recommendations were made using a simplified score to make the statement qualitatively meaningful.

**Keywords:** Acute poisoning intensive care unit, Critical care, Intensive care unit mortality, Intensive care unit outcomes, Poisoning in India, Positioning, Toxicology.

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## INTRODUCTION

India is ranked 49th in the world as far as the rates of self-harm are concerned.<sup>1</sup> Every year 12.4 persons/lakh population commit suicide.<sup>1,2</sup> The commonest mode adopted for committing suicide is hanging (58.2%), followed by poisoning (25.8%) and drowning (5.0%).<sup>1,2</sup> Ayanthi Karunarathne et al. in an Indian systemic review between 1999 and 2018 observed 16,659 deaths related to poisons in India.<sup>3</sup> Pesticides were identified as the dominant agents involved in poisoning throughout the study period as compared to other classes of poisons. Highly hazardous pesticides and insecticides such as aluminum phosphide and organophosphorus compounds were the most important and lethal poisons. The reported incidence, morbidity, and mortality data may be just the tip of the iceberg of the problem, particularly in India.

The Indian Society of Critical Care Medicine (ISCCM) leadership constituted a committee of experts to address the common issues faced by intensivists across the country in the management of poisoned patients. The expert group of 14 intensivists involved actively in the management of poisoned patients in public and private institutions, representing different regions of India met over 5 months in a series of meetings to look at the evidence and develop consensus statements. All the group members systematically searched PubMed, Medline, and Science Direct for original articles on different aspects of management of acutely ill poisoned patients between Jan 1, 2000, and July 1, 2023. The search string used for the literature search included “acute poisoning, approach to poisoning, management of acute

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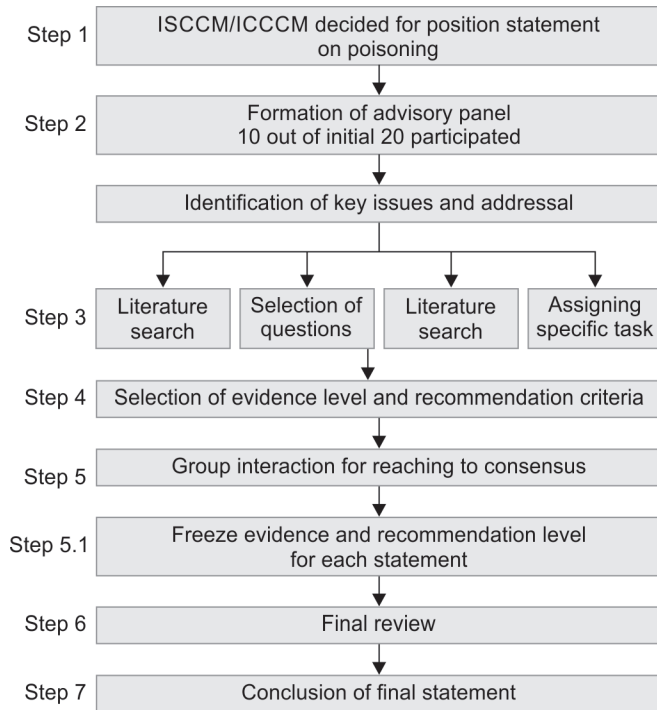


Fig. 1: Consensus flowchart

poisoning, guidelines on the management of poisoning” and “decontamination/elimination/diagnosis/laboratory test”, “fluid resuscitation” or “complications”. Based on the evidence collected, the expert group members prepared statements/answers to the questions. It was unanimously decided that very little evidence is in the form of robust randomized trials/systematic reviews and most of the evidence is at best only “moderate” to “low quality”. All the statements/answers were evaluated and approved by at least 70% of the expert group members. These statements are consensus statements based on “low to moderate quality of evidence”. The position statement intends to give a clear understanding of the subject so that decision-making remains simple and aims to bring about uniformity of approach in Emergency rooms and Intensive care units.

**Steps Adopted to Develop the Position Statement on the General Approach to Poisoning are Stated above (Fig. 1)<sup>4</sup>**

**Step 1**

*Decision to generate position statement on poisoning:* The ISCCM created an expert group under the chairmanship of Dr. Narendra Rungta, past president, of ISCCM. The chairman of the expert group formed subgroups to explore and search literature on the various aspects of the subject. The expert group decided to focus on literature from the year 2000 till date. In the follow-up meeting of ISCCM in Mumbai on the 15th of July 2023, the expert group presented the initial plan which was approved.

**Step 2**

*Formation of an expert group and interaction:* Initially, 20 experts with distinguished academic backgrounds, varied years of experience, and willingness to go through the rigorous exercise

**Table 1:** Approach to critically ill patient with poisoning in emergency room and intensive care unit<sup>5</sup>

Recommendation	Evidence
1. Generally should be performed (Strong)	A. Randomized controlled trials
2. May be reasonable to perform (Moderate)	B. Controlled trials, no randomization
3. Generally, should not be performed (Weak)	C. Observational trials
	D. Opinion of expert panel

Ref<sup>5</sup> Modified from UMHS, 2013, USA: Guidelines for common breast problems. Ionizing radiation in pregnant women: A review of the safety and guidelines. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2015. APPENDIX 3, Grading of recommendations and levels of evidence. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK304620/>

were identified. However, ten experts remained active throughout the process and contributed to the development of the statement. Since the members were selected across the country, belonging to widespread geographical locations, face-to-face discussions were not possible regularly. It was decided that digital platforms would be used for interaction and exchange of ideas for reaching a meaningful conclusion.

**Step 3**

*Identification of key issues and addressal:* The expert group conducted biweekly meetings initially, followed by weekly interactions as per need, on the digital platform to fulfill the following action plan.

**3.1 Literature search:** Published literature and data during the last two decades were considered as reference materials for building the consensus statement.

**3.2 Selection of questions:** Prioritization of issues with relevance to the national scenario was given importance. This was followed by selecting pertinent questions keeping in view the issues of interest and conflict such as the role of gut decontamination in poisoning; use of charcoal, emetics, gastric lavage, etc.

**3.3 Assigning specific tasks:** Specific tasks were assigned to selected sub-groups of experts to distribute the responsibilities uniformly. The chairman and core team maintained consistent coordination amongst the panel members and liaison with the chairman, and research committee of ISCCM.

**3.4 Identification of criteria for grading the evidence and recommendation:** The selection of simple criteria to grade the position statements was decided and followed as described in step 4.

**Step 4**

*Selection of grading criteria:*<sup>5</sup> The group deliberated extensively on various criteria used earlier by (1) The British Committee for Standards in Hematology 2014, UK; (2) Guidelines for Hodgkin Lymphoma, UMHS, 2013, USA, (3) Guideline for common breast problems, SAGES, 2011, USA; and (4) Guidelines for diagnosis, treatment, and use of laparoscopy for surgical problems during pregnancy. Finally, to keep it simple and more meaningful, the group adopted the criteria, mentioned in Table 1. This is a modification of the criteria from 2 and 3 mentioned above by the use of additional



attributes as strong, moderate, and weak against recommendations 1, 2, and 3 as detailed in Table 1.

**Step 5**

*Interaction and decision-making:* A total of 30 meetings were conducted to deliberate on the pre-identified questions. Position statements against each question were framed after extensive discussion amongst the members taking into consideration all the available literature. Each statement was given a recommendation based on the criteria discussed in Table 1. To keep the position statement exercise simpler, the consensus statement method followed by the Australian College of Critical Care Nurses was adopted.<sup>6</sup>

**Step 6**

*Final review:* An extensive review of the position statement was done on 13th December 2023. All the sections were presented by the designated members of the group. All relevant suggestions were incorporated and the final draft of the statement was prepared.

**Step 7**

*Summary and conclusion:* Preselected questions, assigning a level of evidence and recommendation to each statement, were finalized by the expert group through interactive sessions along with external appraisal after the initial draft was prepared. This position statement will serve as the most comprehensive yet simple scientific document on the 'general approach to poisoning in the emergency rooms (ERs) and intensive care units (ICUs)'. It will serve the broad-based needs of clinicians across the country with different levels of expertise in varied geographical locations.

**Position Statement: Approach to Critically Sick Patient with Poisoning in Emergency Room and Intensive Care Unit**

Table 2 summarizes the various questions that were raised and the recommendations of the expert committee.

- Q1. How important are history and circumstantial evidence in the diagnosis of poisonings?  
 Experts' consensus recommends that both the patient's history and circumstantial evidence are very important. However, they should be interpreted with caution.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* History of acute behavioral changes or concerns raised by family members/friends of discordant relationship, treatment for opioid use disorder or mental health problems, e.g. use of "sleeping pills" if available is helpful. Circumstantial evidence includes pills, empty strips, linear track marks, patches on the body, etc.<sup>7</sup> Patients with a significant history of suicidal intent/psychiatric illness or homicidal targets should be viewed as a group that would require psychiatric assessment and follow-up (Annexure 1).

- Q2. What should be the initial approach and objectives in resuscitating a poisoning patient?  
 Experts' consensus recommends an initial approach similar to the resuscitation of a trauma victim with the objectives of restoring physiological reserves as well as addressing potential life threats.

**Level of Evidence: C**

*Recommendation: Strong*

*Rationale:* The expert group unanimously felt that time-bound and focused approach including a quick diagnostic work-up, resuscitation, and management is crucial for the outcome of poisoning patients.<sup>8</sup>

- Q3. While approaching poisoning patients, whether ABC or CAB approach should be followed?  
 Experts' consensus recommends the airway, breathing, circulation (ABC) approach in all poisoning patients. (CAB: Circulation or 'Chest compressions first': This approach is helpful in patients presenting with cardiac arrest).

**Level of Evidence: A**

*Recommendation: Strong*

*Rationale:* Initial assessment of all poisoning patients should be done with a basic "ABC" approach.<sup>8</sup> It is also to be used for resuscitation of the critically ill adult with an unknown overdose. On the other hand, the CAB (chest compression first) approach can be applied to patients presenting with cardiac arrest on admission (Annexure 2).<sup>9</sup>

- Q4. What are the initial investigations that must be performed on a patient of poisoning?  
 Experts' consensus recommends pulse oximetry, continuous cardiac monitoring (ECG), capillary glucose monitoring, and blood gas analysis as essential parts of initial evaluation in all patients of poisonings.

**Level of Evidence: C**

*Recommendation: Strong*

*Rationale:* These tests help evaluate and treat life-threatening situations in all cases of poisonings, particularly in comatose or seizure patients.<sup>10</sup> Drug-induced circulatory failure and arrhythmias are common and life-threatening not only with cardiovascular drugs but also with various other toxicants.<sup>11</sup> These tests are particularly important where altered mental status precludes obtaining an ingestion history directly from the patient.

- Q5. Should oxygen be administered to all patients with poisoning?  
 Experts' consensus recommends evidence-based oxygen administration. Oxygen administration may be harmful sometimes, as seen in paraquat poisoning.

**Level of Evidence: A**

*Recommendation: Strong*

*Rationale:* Oxygen should be administered only in critically sick poisoning patients with SpO<sub>2</sub> ≤ 92%. Clinical assessment and arterial blood gas analysis may be used as a guide for oxygen use in such patients. It is a known fact that oxygen is useful only when indicated.<sup>12</sup> When not indicated, oxygen use may be associated with harm to the patient as particularly seen in paraquat poisoning (Annexure 3).<sup>13</sup>

- Q6. What is the role of the Toxidromic approach in poisoning?  
 Experts' consensus recommends the use of a toxidromic approach in poisoning as it acts as a navigation chart to help identify the poison and send relevant investigations.

**Table 2:** Summary of the position statement

S. no.	Question and answer	Recommendation
Q1.	How important are history and circumstantial evidence in diagnosis of poisonings? We recommend that both patient's history and circumstantial evidence are very important. However, they should be interpreted with caution.	Moderate
Q2.	What should be the initial approach and objectives in resuscitating a poisoning patient? We recommend initial approach which is similar to resuscitation of trauma victim with the objectives to restore physiological reserves as well as addressing potential life threats.	Strong
Q3.	While approaching poisoning patients, whether ABC or CAB approach should be followed? We recommend airway, breathing, circulation (ABC) approach in all poisoning patients.	Strong
Q4.	What are the initial investigations that must be performed in patients of poisoning? We recommend pulse oximetry, continuous cardiac monitoring (ECG), capillary glucose monitoring, blood gas analysis as essential parts of initial evaluations in all patients of poisonings.	Strong
Q5.	Should oxygen be administered to all patients of poisoning? We recommend evidence-based oxygen administration. Oxygen administration may be harmful sometimes, as in paraquat poisoning.	Strong
Q6.	What is the role of the Toxidromic approach in poisoning? We recommend the use of Toxidromic approach in poisoning as it acts as a navigation chart to help identify the poison and send relevant investigations.	Strong
Q7.	Should all patients of poisoning receive antidotes? We strongly recommend the administration of appropriate antidote, wherever indicated, as early as possible after arrival in the ER/ICU.	Strong
Q8.	Should poison severity score (PSS) be used in patients of poisoning? We recommend against use of PSS for assessment in patients of poisoning.	Strong
Q9.	What are the other laboratory tests that must be performed in patients of poisoning? We recommend performing renal function tests, serum electrolytes including calcium and magnesium, liver function tests, and urine pregnancy tests in females of childbearing age. We suggest that serum osmolality, anion gap, serum lactate, serum ketones, creatine kinase, and co-oximetry may also be performed wherever available.	Strong
Q10.	What is the usefulness of qualitative toxicology screening tests in poisonings? We recommend against the routine use of qualitative toxicology screening tests in patients with poisoning. These tests are supportive and not confirmative of the clinical suspicion and diagnosis.	Weak
Q11.	What is the indication and role of gastric lavage in the management of unknown poisoning in the ER/ICU? a) We recommend against the routine use of gastric lavage in every patient of poisoning b) However, gastric lavage may be considered in few selected patients who present within one hour of ingestion of potentially lethal dose of poison after carefully weighing the risk-benefit ratio.	Strong Moderate
Q12.	What is the role of activated charcoal (AC) in removal of poison from GI tract within one hour and beyond? a) We recommend the use of AC within one hour of poison ingestion. b) We suggest use of AC in poisoning beyond one hour in selected patients and also if there is suspected ingestion of sustained-release formulations like pellets and sachets.	Strong Moderate
Q13.	Should tracheal intubation be performed in all cases of GI decontamination? We recommend against tracheal intubation in patients of poisoning for the purpose of gastric lavage and AC administration.	Strong
Q14.	What is the role of carriers like saline, water, oils, potassium permanganate in GI decontamination? We recommend against use of carriers like saline, water, oils, potassium permanganate in GI decontamination.	Moderate
Q15.	What is the role of multidose activated charcoal (MDAC) in management of poisoning? We recommend MDAC in selective drug formulations and in patients, who have consumed extended or delayed release formulations.	Moderate
Q16.	What is the role of whole bowel irrigation (WBI) in poisoning? We do not recommend WBI to be done routinely, but it may be helpful in ingestions of sustained-release or enteric-coated pill formulations, ingestion of illicit drug packets and consumption of toxins not adsorbed by AC.	Weak
Q17.	What is the role of emetics and cathartics in the management of poisoning? We recommend against use of emetics and cathartics in the management of poisoning.	Moderate

(Contd...)

**Table 2:** (Contd...)

S. no.	Question and answer	Recommendation
Q18.	What is the role of imaging in patients of poisoning? We recommend imaging according to the clinical need of the case such as <ul style="list-style-type: none"> <li>• Plain chest radiograph for all patients.</li> <li>• Plain abdominal radiograph for ingestion of drug packets of certain radiopaque toxins.</li> <li>• CT head for altered sensorium if there is no improvement after dextrose and thiamine administration.</li> </ul>	Moderate
Q19.	What is the approach to seizures in patients of poisoning? We recommend use of benzodiazepines as first antiepileptic drug (AED). We recommend against the use of phenytoin as first AED in these patients.	Moderate
Q20.	What is the treatment of hypertension in patients of poisoning? We recommend use of a benzodiazepine to treat hypertension in an agitated poisoning patient. We recommend the use of short-acting alpha-beta blocker like labetalol for the treatment of hypertension in patients of poisoning. If patient does not respond, a specialist opinion may be sought.	Moderate
Q21.	What is the role of extracorporeal therapies in poisonings? We do not recommend the routine use of extracorporeal therapy in poisoning. However, timely consideration of such focused therapies may be considered for the indications listed in the annexure.	Moderate
Q22.	Is neuropsychiatric assessment mandatory in patients of poisoning? We recommend neuropsychiatric assessment for all patients with suspected suicidal or intentional poisoning before discharge.	Moderate
Q23.	When should a patient of poisoning be discharged? We recommend all cases of poisoning should not be discharged without observation for at least 24 hours after resolution of symptoms.	Strong

**Level of Evidence: B**

*Recommendation: Strong*

*Rationale:* Toxidromes help to carry out the differential diagnosis in a case of poisoning.<sup>14</sup> In most patients with unclear symptoms and incomplete medical history, the diagnosis of poisoning is made by matching the symptoms or findings that are compatible with toxidromes. It also provides a guideline for laboratory tests and treatment (Annexure 4).

Q7. Should all patients of poisoning receive antidotes?  
Experts' consensus strongly recommends the administration of appropriate antidote, wherever indicated (Annexure), as early as possible after arrival in ER/ICU.

**Level of Evidence: B**

*Recommendation: Strong*

*Rationale:* Prompt administration of a specific antidote is potentially life-saving. Antidote administration is a must when an antidote is available against a particular poison, its efficacy is known, and the severity of the poisoning and the expected benefits of therapy outweigh its associated risks. Antidotes dramatically reduce morbidity and mortality in certain intoxications (Annexure 5).<sup>15</sup>

Q8. Should PSS be used in all patients of poisoning?  
Experts' consensus recommends against the use of PSS for assessment in patients of poisoning.

**Level of Evidence: A**

*Recommendation: Strong*

*Rationale:* Poison severity score is a standardized and generally applicable scoring system for grading the severity of poisoning,

PSS, in its current form has limited clinical utility since it does not provide any value-added clue or advantage about specific poisoning agent (Annexure 6).<sup>16</sup>

Q9. What are the other laboratory tests that must be performed on patients with poisoning?  
Experts' consensus recommends performing renal function tests, serum electrolytes including calcium and magnesium, liver function tests, and urine pregnancy tests in females of childbearing age.  
We suggest that serum osmolality, anion gap, serum lactate, serum ketones, creatine kinase, and co-oximetry may also be performed wherever available.

**Level of Evidence: C**

*Recommendation: Strong*

*Rationale:* The results of these tests provide information about existing comorbidities, the current status of acid-base abnormalities, and the development of complications that increase the risk of permanent organ damage.<sup>17,18</sup> These investigations help to exclude or confirm important differential diagnoses, guide appropriate treatment, redefine risk assessment or prognosis, and consider the need for extended observation, admission, and critical care as necessary.<sup>19</sup>

Q10. What is the usefulness of qualitative toxicology screening tests in poisonings?  
Experts' consensus recommends against the routine use of qualitative toxicology screening tests in patients with poisoning.  
These tests are supportive and not confirmative of the clinical suspicion and diagnosis.

**Level of Evidence: C**

*Recommendation: Weak*

*Rationale:* Although screening tests are rapid, easily available, cheap, and sensitive; they lack specificity and cross-reactivity to structurally similar compounds. Most urine drug screens do not provide quantitative results. The physician may face many clinical challenges as positive drug screens may result from previous use and the patient may present without clinical symptoms or with minimal symptoms as they exhibit tolerance.<sup>20,21</sup> Negative screens do not exclude the use of particular substances (Annexures 7 and 8).

Q11. What is the indication and role of gastric lavage in the management of unknown poisoning in the ER/ICU?

*Experts' consensus:* This question has been addressed in two parts:

- a. We recommend against the routine use of gastric lavage in every patient of poisoning.

**Level of Evidence: A**

*Recommendation: Strong*

- b. However, gastric lavage may be considered in a few selected patients who present within one hour of ingestion of a potentially lethal dose of poison after carefully weighing the risk-benefit ratio.<sup>22</sup>

**Level of Evidence: B**

*Recommendation: Moderate*

*Rationale:* Beyond one hour, very little poison is left in the stomach. Researchers have found that with the performance of gastric lavage, there is evidence of pushing the poison beyond pylorus which may enhance its absorption. Also, there is a high risk (5–7%) of aspiration pneumonia (Annexure 9).<sup>23</sup>

Q12. What is the role of activated charcoal (AC) in the removal of poison from the GI tract within one hour and beyond?

*Experts' consensus:* This question has been addressed in two parts:

- a. We recommend the use of AC within one hour of poison ingestion.

**Level of Evidence: A**

*Recommendation: Strong*

*Rationale:* Activated charcoal use is most beneficial in the first hour when the toxin remains in the stomach. Volunteer trials have suggested that absorption decreases by up to 95% when AC is administered within 5 minutes. After one hour, systemic absorption is reduced to the range of 50–75%.<sup>24,25</sup>

- b. We suggest the use of AC in poisoning beyond one hour in selected patients if there is suspected ingestion of sustained-release formulations like pellets and sachets.

**Level of Evidence: B**

*Recommendation: Moderate*

*Rationale:* Some volunteer trials have indicated the potential benefit of AC even when administered two or three hours later. Careful assessment and consideration of the pharmacokinetics of the ingested agent is required to understand the possible benefits of AC in poisoning beyond one hour (Annexures 10 and 11).<sup>26,27</sup>

Q13. Should tracheal intubation be performed in all cases of gastrointestinal (GI) decontamination?

Experts' consensus recommends against tracheal intubation in patients of poisoning for gastric lavage and AC administration.

**Level of Evidence: B**

*Recommendation: Strong*

*Rationale:* Considering the widespread use of AC, the overall risk of aspiration, associated with its administration is very low.<sup>28</sup> In clinical trials, the risk of aspiration is less than one percent with AC.<sup>29</sup> Tracheal intubation is to be reserved for cases when there is evidence of airway compromise or there are additional standard indications.

Q14. What is the role of carriers like saline, water, oils, and potassium permanganate in GI decontamination?

Experts' consensus recommends against the use of carriers like saline, water, oils, and potassium permanganate in GI decontamination.

**Level of Evidence: D**

*Recommendation: Moderate*

*Rationale:* The expert group is against the use of gastric lavage in the management of poisonings due to the risks involved. Therefore, need for further elaboration on the role of the above-mentioned compounds is not required.

Q15. What is the role of MDAC in the management of poisoning?

Experts' consensus recommends MDAC in selective drug formulations and in patients, who have consumed extended or delayed-release formulations.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* Multidose-activated charcoal is thought to act by interrupting the enterohepatic recirculation and facilitation of transmucosal diffusion from the body into the bowel lumen ("gut dialysis"). Hence, it reduces the absorption of delayed-release preparations (Annexure 12).<sup>30,31</sup>

Q16. What is the role of whole bowel irrigation (WBI) in poisoning?

Experts' consensus does not recommend WBI to be done routinely, but it may be helpful in ingestions of sustained-release or enteric-coated pill formulations, ingestion of illicit drug packets, and consumption of toxins not adsorbed by AC.

**Level of Evidence: C**

*Recommendation: Weak*

*Rationale:* Whole bowel irrigation refers to the administration of osmotically balanced polyethylene glycol electrolyte solution (PEG-ES) to induce liquid stool which mechanically flushes pills, tablets, or drug packets from the GI tract. It is continued until the rectal effluent is clear. Thus, it may be useful in patients who present more than two hours after ingestion and (therefore), are not likely to benefit from AC administration (Annexure 13).<sup>32,33</sup>

Q17. What is the role of emetics and cathartics in the management of poisoning?

Experts' consensus recommends against the use of emetics and cathartics in the management of poisoning.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* Emesis yields unpredictable and inconsistent results and has an increased risk of aspiration.<sup>34</sup> Cathartics are intended to decrease poison absorption by enhancing rectal evacuation of toxins. They are not recommended as GI side effects, dehydration, and electrolyte abnormalities are common with their use (Annexure 14).<sup>35</sup>

- Q18. What is the role of imaging in patients with poisoning?  
Experts' consensus recommends imaging according to the clinical need of the case as follows:
- Plain chest radiograph for all patients.
  - Plain abdominal radiograph for ingestion of drug packets of certain radiopaque toxins.
  - CT head for altered sensorium if there is no improvement after dextrose and thiamine administration.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* Signs of non-cardiogenic pulmonary edema, ARDS, or aspiration may be evident on the chest radiograph. Ingestion of drug packets of certain radiopaque toxins may be visualized by plain film radiographs in "body packers" or "body stuffers".<sup>36,37</sup> However, it can be used to quantify the amount involved but it cannot identify the specific toxin ingested.<sup>38</sup> Abdominal ultrasounds does not appear to be a reliable method of detecting ingested substances.

- Q19. What is the approach to seizures in patients of poisoning?  
Experts' consensus recommends the use of benzodiazepines as the first antiepileptic drug (AED). We recommend against the use of phenytoin as the first AED in these patients.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* Benzodiazepines are the first choice AEDs in poisoning-associated seizures. Propyl glycol-containing formulations like phenytoin should be avoided. It, in itself, can induce seizures and lactic acidosis with prolonged infusions. Seizures caused by certain agents may require specific antidotes for their successful termination like glucose for hypoglycemia, and pyridoxine for isoniazid-induced seizures.<sup>39</sup>

- Q20. What is the treatment of hypertension in patients with poisoning?  
Experts' consensus recommends the use of a benzodiazepine to treat hypertension in an agitated poisoning patient. We recommend the use of short-acting alpha-beta blockers like labetalol for the treatment of hypertension in patients with poisoning. If the patient does not respond, a specialist opinion may be sought.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* Resolution of anxiety with a benzodiazepine, which decreases CNS sympathetic outflow, leads to resolution of hypertension and tachycardia.<sup>40</sup> The mixed beta/alpha blocker, labetalol is safe and effective for treating hypertension and tachycardia without any "unopposed alpha-stimulation" adverse events.<sup>41</sup>

- Q21. What is the role of extracorporeal therapies in poisoning?  
Experts' consensus does not recommend the routine use of extracorporeal therapy in poisoning. However, timely consideration of such focused therapies may be considered for the indications listed in the Annexure.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* The 'risk versus benefit', availability, and cost, preclude the routine use of extracorporeal therapies in poisonings. The indication and choice of modality depends not only on the molecular characteristics of the poison but also on patient status. Some poisons that lead to refractory cardiogenic shock can be managed by timely use of ECMO. This 'shock' may be due to cytotoxic insult (aluminum phosphide), or overdose of myocardial depressants ( $\beta$ -blockers, calcium channel blockers).<sup>42</sup> Available evidence supports early (<4 hours) use of charcoal hemoperfusion in paracetamol poisoning, which is otherwise almost fatal.<sup>43</sup> There are few other poisons where hemodialysis/Plasmapheresis may be beneficial (Annexures 15 and 16).<sup>44</sup>

- Q22. Is neuropsychiatric assessment mandatory in patients with poisoning?  
Experts' consensus recommends neuropsychiatric assessment for all patients with suspected suicidal or intentional poisoning before discharge.

**Level of Evidence: C**

*Recommendation: Moderate*

*Rationale:* High-risk factors like terminal illness, psychiatric disorder, evidence of planning for drug overdose, and suicidal notes, should prompt psychiatric evaluation and these patients should always be discharged to the care of a responsible caretaker.<sup>45</sup> Social support should also be offered to substance-abuse patients, including rehabilitation.

- Q23. When should a patient of poisoning be discharged?  
Experts consensus recommends no case of poisoning should be discharged without observation for at least 24 hours after resolution of symptoms.

**Level of Evidence: C**

*Recommendation: Strong*

*Rationale:* All poisoning patients, including those with asymptomatic presentations or mild toxicity, should be observed for resolution of symptoms and signs for at least 24 hours before discharge as there are reports of deaths following discharge, both from same or new poisoning re-admission with diagnosis missed at the index episode; or at follow-up of concomitant conditions, diagnosed at index.<sup>46,47</sup>

*Limitations in forming the position statement:* Members of the expert group strongly believed that at least a 'one-day' physical meeting of concerned members would have allowed better face-to-face brainstorming, generation of ideas, and problem-solving approach to the whole issue. However, due to unavoidable reasons, it was not possible, and therefore, all the meetings were conducted only on a virtual platform which has its limitations and erraticism.

*Future course of action:* Regular reviews for updating the position statement, in response to the latest developments, research, and advances, along with upcoming challenges, is mandatory to maintain the dynamicity of clinical practice at a given point in time

in the future. ISCCM/ICCCM will deem it appropriate to take action as per need and may decide the periodic time interval (not less than 5 years) to fulfill the desired objective.

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## ANNEXURE 1

### Clinical Diagnosis and Initial Management of Poisoned Patient

#### *Symptoms Associated with Serious Poisoning*

- Being sick.
- Dizziness.
- Sudden, noticeable heartbeats (palpitations).
- Breathing difficulties.
- Uncontrollable restlessness or agitation.
- Seizures (fits).
- Drowsiness or loss of consciousness.
- Poison-severity and symptoms.
- History.
- Timing.
- Dose.
- Quantity.
- Route of entry.
- Potential mixing with other pharmaceuticals or chemicals (e.g. alcohol, other hepatotoxins or nephrotoxins).
- Patient characteristics, demographics and comorbidity.
- Intentional or accidental exposure.
- Availability of drugs at home.
- Any member of the family has chronic diseases (hypertension, diabetic, etc.).
- Missing tablets or any empty pill bottles or other material with patient.<sup>1</sup>

## ANNEXURE 2

### ABCD or CAB Approach

Airway, Breathing Circulation, Disability and Neurological Stabilization, Exposure and Elimination (ABCDE)

#### Disability and Neurological Stabilization

Once the airway, breathing, and circulation are secured, attention is next directed towards stabilizing and specific management of the poison ingested.

CAB – ‘Chest compressions first’ is used to treat people who have suffered

- A cardiac arrest.
- An electric shock.
- Smoke inhalation.
- Near-drowning.<sup>2</sup>

This can be restoring blood circulation to vital organs more quickly, potentially increasing the victim’s chance of survival.<sup>3</sup>

## ANNEXURE 3

### Oxygen

Oxygen supplement is given to poisoning patients on need basis. Administration of excessive oxygen should be avoided in paraquat poisoning because it may worsen its toxicity.<sup>4</sup>

Paraquat (N, N'-dimethyl-4, 4'-bipyridinium dichloride, PQ) intoxication is a common cause of lethal poisoning. This study is aimed at identifying the risk of using liberal oxygen therapy in patients with PQ poisoning. This was a multicenter retrospective

cohort study involving four medical institutions in Taiwan. Data were extracted from the Chang Gung Research Database (CGRD) from January 2004 to December 2016. Patients confirmed to have PQ intoxication with a urine PQ concentration  $\geq 5$  ppm were analyzed. Patients, who received oxygen therapy before marked hypoxia ( $SpO_2 \geq 90\%$ ), were defined as receiving liberal oxygen therapy. Among 416 patients, the liberal oxygen group had a higher 28-day mortality rate as opposed to the conservative oxygen group (87.8% vs 73.7%  $p = 0.007$ ; adjusted odds ratio (aOR): 4.71, 95% CI: 1.692–21.049. The overall mortality was also higher in the liberal oxygen group (aOR: 5.97, 95% CI: 1.692–21.049); So therefore, oxygen therapy should be avoided in Paraquat poisoning until there is evidence of hypoxia ( $SpO_2$  is dropped to  $< 90\%$ ).<sup>4</sup>

Paraquat is oxidized to the paraquat radical upon entry into the cell and is subsequently reduced by enzyme systems such as (Nicotinamide adenine dinucleotide phosphate) NADPH-cytochrome P450 reductase and nitric oxide synthase to form a mono-cation (PQ+). The PQ+ is then rapidly re-oxidized to form the parent paraquat compound in the presence of  $O_2$  and generates a superoxide radical (a reactive oxygen species). Reactive oxygen species have the characteristic of cytotoxicity that causes oxidative stress. This leads to lipid peroxidation, consumption of intracellular NADPH as long as NADPH and oxygen are available, mitochondrial damage, and even apoptosis.

## ANNEXURE 4 (TABLE A1)

### Toxidrome

Toxidromes act as a navigation chart for the clinician to carry out the differential diagnosis within the multiple potentially causative toxic agents, and provide a guideline for laboratory tests and treatment.

Recognition of poison is important for several reasons, but toxidrome does not indicate the specific poison in most cases. Identifying the poison or toxin helps institute therapeutic interventions and narrows the differential diagnoses. This can be especially useful when a patient has access to multiple potential poisons.<sup>5</sup>

The most common toxidrome is from anticholinergic poisoning.

- Although poisoning is a part of the differential diagnosis in all cases of poorly defined illness, consideration of nontoxic causes, such as head or environmental trauma, which may occur concomitantly, is vital to ensure that treatable conditions are not overlooked.<sup>6</sup>

Neurologic stabilization. The so-called “coma cocktail” of dextrose, oxygen, naloxone, and thiamine given empirically is an outdated concept and has been replaced by selective use of each component as necessary.<sup>7,8</sup>

Diagnosis of a poisoning may be helped by the accompanying physical findings:

- Pupillary changes.
- Characteristic typical odors.
- Respiratory changes.
- Mental status changes.
- Neuromuscular abnormalities.
- Temperature alterations.
- Blood pressure and heart rate alterations.
- Skin appearances.

**Table A1:** Toxidromic approach

<i>Toxidrome approach</i>	<i>Mental status alterations</i>	<i>Pupillary changes</i>	<i>Vital parameters</i>	<i>Other symptoms/signs</i>	<i>Possible toxic agents</i>
Anticholinergic	Agitation, hallucination, delirium, coma	Mydriasis	Hyperthermia, tachycardia, hypertension, tachypnea	Dry flush skin, dry mucous membranes, decreased bowel sounds, urinary retention, myoclonus	Antihistamines, TCA, Antiparkinsonism agents, atropine, antispasmodics
Sympathomimetic	Hyper alert, agitation, hallucination, paranoia	Mydriasis	Hyperthermia, tachycardia, hypertension, widened pulse pressure	Diaphoresis, tremors, hyperreflexia, seizures	Cocaine, amphetamines, ephedrine, theophylline,
Opioid	CNS depression, coma	Miosis	Bradypnea, apnea	Hyporeflexia, pulmonary edema, needle marks	Heroin, morphine, methadone,
Hallucinogenic	hallucination, perceptual distortions, depersonalization, agitation	Mydriasis (usually)	Hyperthermia, tachycardia, hypertension, tachypnea	Nystagmus	t > phencyclidine, MDMA, MDEA
Sedative-hypnotic	CNS depression, confusion, Stupor, coma	Variable	Often normal; hypothermia, bradycardia, hypotension, bradypnea, apnea	Hyporeflexia	Benzodiazepines, barbiturates, alcohol, zolpidem
Cholinergic	Confusion, coma	Miosis	Bradycardia, hypertension, tachypnea, hypotension, bradypnea	Salivation, urinary and fecal incontinence, diarrhea, emesis, diaphoresis, lacrimation, GI cramps, bronchoconstriction, muscle fasciculations, weakness, and seizures	Organophosphate and carbamate insecticide, nerve agents, nicotine, physostigmine, edrophonium
Serotonin syndrome	Confusion, agitation, coma	Mydriasis	Hyperthermia, tachycardia, hypertension, tachypnea	Tremors, myoclonus, hyperreflexia, clonus, diaphoresis, flushing, trismus, rigidity, diarrhea	MAOIs, SSRs, meperidine, dextromethorphan, TCA

CNS, central nervous system; GI, gastrointestinal; MDEA, methyldiethanolamine; MDMA, 3,4-methylenedioxyamphetamine; TCA, tricyclic antidepressant

## ANNEXURE 5

### Antidotal Therapy

A response to empirically administered antidotes can be used to suggest a suspected diagnosis, their indiscriminate use can potentially increase patient morbidity. Consideration of antidotal therapy is limited to specific toxins. Supportive care is the mainstay of treatment.

Antidotal therapy depends on the pharmacokinetic (toxicokinetic) properties of the poison. Routine administration of flumazenil to comatose patients suspected of benzodiazepine (BZD) overdose may precipitate seizures, particularly if a pro convulsant drug has also been ingested, hence it should be used judiciously. A patient with confirmed BZD ingestion, with no pro convulsant co-ingestion (e.g., TCA, bupropion), and no witnessed or suspected seizure, having respiratory depression or compromised airway, may respond to Flumazenil by improving respiratory drive and airway tone. This intervention can avoid endotracheal intubation. Flumazenil should not be used in "coma cocktail" routinely in all patients with undifferentiated obtundation.<sup>9</sup>

### PAM (Pralidoxime)

Evidence about the use of oximes to treat OP poisoning is inconsistent and difficult to interpret.<sup>10</sup>

#### *Antidotal Therapy with Antibody (Fab) Fragments*

Indications and general approach: Early administration of Fab fragments is essential for the successful treatment of severe poisoning due to cardiac glycosides. Fab fragments are safe and effective and have changed the management for a better outcome after cardiac glycoside poisoning.<sup>11,12</sup>

Treatment with Fab fragments based solely upon the serum digoxin concentration or the amount ingested is not advocated but for the following clinical status.

- Hyperkalemia (serum potassium >5–5.5 mEq/L).
- Evidence of end-organ dysfunction from hypoperfusion (e.g., renal failure, altered mental status).
- Life-threatening or unstable dysrhythmia (e.g., ventricular tachycardia; ventricular fibrillation; asystole; complete heart block; symptomatic bradycardia).<sup>8</sup>

## ANNEXURE 6

### Poison Severity Score (PSS)

The PSS was developed as a tool to document encounters with poisoned patients. However, it is used infrequently and, when applied, has been misused or modified from its original form. In its current form, it has limited clinical utility and cannot be broadly applied to many exposures due to their unique clinical circumstances.<sup>10,13</sup>

A consciousness rating scale (Glasgow score, Alert Verbal Pain Unresponsive scale: AVPU), assessed by a trained first responder, can be useful.<sup>14,15</sup>

In the prehospital setting and emergency departments, no multipurpose severity score [simplified acute physiology score (IGS or SAPS), sequential organ failure assessment (SOFA), acute physiology and chronic health evaluation (APACHE)] has been shown to have a sufficient predictive value to allow early, individual detection of the risk of complications, the need for intensive care unit admission or death.<sup>16</sup>

Risk assessment is a distinct cognitive process through which the clinician attempts to predict the likely clinical course and potential complications for the individual patient at that particular presentation. Risk assessment should be quantitative and take into account agent, dose, time of ingestion, current clinical status, and individual patient factors (for example, weight and comorbidities).<sup>11</sup>

## ANNEXURE 7

### Screening Tests

Screening tests are not sufficient to establish a diagnosis or prognosis or to monitor the kinetics of one or more toxins and their metabolites.<sup>17–19</sup>

### Routine Screening Test

#### Clinical Challenges

- Positive drug screens in patients without clinical symptoms may reflect the detection of metabolites and previous use.
- Positive drug screens in patients with minimal symptoms may reflect acute use in patients who exhibit tolerance.
- Positive screens in patients with symptoms that do not fit with acute intoxication may still reflect prior use and cause clinicians to assume, incorrectly, that there is a definitive diagnosis.
- Negative screens will often not be able to exclude the use of these substances as well.
- In a patient with suspected poisoning, the experts recommend a clinical approach based on clinical features (toxicodromes) rather than on the non-quantitative results of blood or urine toxicology screening tests.
- Urinary screening provides complementary information to blood screening, over a larger screening window, but the results of urine screening can never be used to interpret the toxicodrome observed at the time of the urine sample.
- Screening can be useful in specific situations:
  - When the clinical diagnosis has not been established, complementary examinations are incompatible with the

patient's history or in the presence of circulatory failure or unexplained coma.

- Any toxicological screening tests must be systematically completed by targeted blood toxicology screening in order to assay blood concentrations, which are more closely correlated with toxicity.<sup>20,21</sup>

#### Disadvantages of Urine Testing

- Can detect specific substances rather than an entire class of drugs.
- Cross-reactivity to structurally similar compounds is possible.
- New-generation immunoassays have reduced sensitivity and specificity.
- May not screen for some existing illicit drugs such as synthetic cannabinoids, MDMA (ecstasy), and chemical variants of opioids and PCP, ketamine, chloral hydrate, gamma-hydroxybutyrate (GHB), flunitrazepam.<sup>4,5</sup>
- Most urine drug screens do not provide quantitative testing.
- Varying windows of detection depending on the substance ingested.
- Collection of the specimen should occur within 4 minutes of providing a sample, with at least 30 mL volume, temperature between 32.2°C (90°F) and 37.7°C (100°F), and pH of 4.5–8.5.

#### Indications for Specific Testing in the Acutely Poisoned Patient

- Refine risk assessment or prognosis.
- Exclude or confirm an important differential diagnosis.
- Exclude or confirm an important specific poisoning.
- Exclude or confirm a complication that requires specific management.
- Establish an indication for antidote administration.
- Establish an indication for the institution of enhanced elimination.

#### Screening Tools

- Rapid response methods (immunological and enzymatic), mainly for substances only detected in urine. These methods are of little value for screening drug classes, due to their lack of specificity and sensitivity.
- Methods that provide a response in less than 24 hours, based on specialized techniques (liquid or gas chromatography), using various types of mass spectrometry (MS) and/or diode array detection.<sup>22,23</sup>
- A biological sample collection (serum/plasma or urine samples) should always be considered at the time of the patient's admission when the etiology is unclear or in the presence of signs of severity.<sup>20,24</sup>
- Semiquantitative blood screening can be a useful diagnostic tool in the same way as specific drug assays.
- The recent development of high-resolution MS technologies represents real technological progress, allowing non-targeted screening methods.<sup>25</sup>

**ANNEXURE 8**

Positive predictive value and limitations of commonly tested drugs in screening of poisoning

<i>Drug class</i>	<i>What is detected?</i>	<i>What is not detected?</i>	<i>Positive predictive value (PPV)</i>	<i>Other considerations</i>
Amphetamines	D-amphetamine and D-methamphetamine	Lack of sensitivity to 3,4-methylenedioxyamphetamine (MDMA) and 3,4-methylenedioxyamphetamine (MDMA, 'ecstasy')	9.3%	Sensitivity for MDMA is about 50% less than for D-amphetamine and D-methamphetamine. When screening neonates, maternal labetalol use may give a positive result as labetalol metabolites have been reported to cause amphetamine positive screens
Benzodiazepines	Diazepam metabolites nordiazepam and/or oxazepam	Lorazepam, clonazepam and other benzodiazepines (flunitrazepam) do not share these metabolites so are often undetected.	74.6%	Some benzodiazepines (particularly clonazepam) at therapeutic or even above therapeutic doses may not exceed detection levels in the urine.
Cocaine	Benzoyllecgonine (inactive metabolite excreted in the urine) with good sensitivity and specificity.		100% (metabolite specific to cocaine and has no cross-reactivity)	Passive inhalation (unless prolonged and heavy exposure) will not produce a positive result. Acute massive overdose may take longer to metabolize and so time for metabolite to show up in the urine may be longer
Opiates	Natural alkaloids including morphine and codeine. As heroin (diacetylmorphine) is directly synthesized from morphine, is often also picked up	Synthetic opioids such as methadone, oxycodone, fentanyl and tramadol are frequently undetected. They may require adjunct immunoassays, which also have cross reactivity.	Opioids 100% Oxycodone 67.6% Methadone 44.4%	This may be the least sensitive and specific urinary drug screen
Marijuana	11-nor-9-carboxy-delta-9- tetrahydrocannabinol, which is the major metabolite of marijuana excreted in the urine.	Synthetic cannabinoids like 'spice' and 'K2' are not detected with most EIAs		Generally good sensitivity and specificity for this
Lysergic acid diethylamide (LSD)	High sensitivity but low specificity because that only a small amount of the parent molecule appears in the urine.			New generation immunoassays are becoming available which target the metabolite 2-oxo-3-hydroxy-LSD, which appears in greater concentrations in the urine, so this may improve detectability.
Tricyclic antidepressants (TCAs)				There is a high overlap in structure between TCAs and other agents such as muscle relaxants, antipsychotics, anticonvulsants and antihistamines, so there is a high prevalence of inappropriate results. Not recommended as the test is used if TCA toxicity is suspected.

## ANNEXURE 9

### Gastrointestinal Decontamination in Poisoning

Gastrointestinal decontamination is historically practiced as a procedure to functionally remove an ingested toxin from the gastrointestinal (GI) tract to decrease its absorption or increase its clearance. Many of these practices have fallen out of favor over some time and newer evidence has led to a better understanding of the efficacy, risks, and benefits of decontamination.

We provide an overview of the approach to gastrointestinal decontamination in poisoned patients and a review of the evidence supporting the procedure recommended.

#### Gastric Lavage

Gastric lavage is a procedure where small aliquots of fluid are repeatedly instilled and aspirated through a large bore orogastric tube in an attempt to aspirate toxins from within the stomach. This modality has been largely abandoned worldwide, due to unclear benefits and the risk of serious complications.

## ANNEXURE 10

### Activated Charcoal (AC)

Activated charcoal is a highly adsorbent powder produced by pyrolysis of organic material. Its extensive surface area is covered with a carbon-based network that adsorbs chemicals within minutes of contact, preventing gastrointestinal absorption and subsequent toxicity.

#### Administration

Activated charcoal is available as a powder that is mixed with water to form a slurry. Activated charcoal is also commercially available as a suspension with sorbitol as a thickening agent, which may help improve palatability and additionally act as a cathartic.

#### Contraindications for AC

- Depressed mental status without airway protection (risk of aspiration).
- Late presentation (more than two hours likely useful).
- Hydrocarbon ingestion.
- Need for endoscopy (e.g., significant caustic ingestion) – AC is likely to impair visibility during endoscopy.
- Toxins poorly adsorbed by AC (e.g., metals including iron and lithium, alkali, mineral acids, alcohols).
- Presence of intestinal obstruction (absolute contraindication) or paralytic ileus (relative contraindication).

**Dose:** There is a dose-response relationship. *In vitro* studies suggest an AC: toxin ratio of 10:1 to be effective.

**Adults:** The dose is 1 gm per kg 25–100 gm (with 50 gm representing the usual adult dose)

### Complications

Gastrointestinal side effects including fullness, abdominal pain, nausea, vomiting, constipation, and diarrhea have been reported, with higher rates occurring if AC is used in combination with sorbitol.

According to two randomized trials, aspiration occurs in less than one percent of poisonings and is not increased in patients who receive AC. Aspiration occurred most often when AC was used

in conjunction with gastric lavage which is no longer routinely recommended.

## ANNEXURE 11

Agents for which activated charcoal is not recommended

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*Heavy metals*

Arsenic  
Lead  
Mercury  
Iron  
Zinc  
Cadmium

*Inorganic ions*

Lithium  
Sodium  
Calcium  
Potassium  
Magnesium  
Fluoride  
Iodide

*Boric acid*

*Corrosives*

Acids  
Alkali  
Hydrocarbons  
Alkanes  
Alkenes  
Alkyl halides  
Aromatic hydrocarbons

*Alcohols*

Acetone  
Ethanol  
Ethylene glycol

*Isopropanol*

Methanol

Essential oils

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## ANNEXURE 12

### Multidose Activated Charcoal (MDAC)

#### Indications

Multidose activated charcoal may be helpful in life-threatening ingestions of the following medications, but the evidence is limited.

- Carbamazepine.
- Dapsone.
- Phenobarbital.
- Quinine.
- Theophylline.
- Caffeine.
- Acetylsalicylic acid (aspirin).
- Phenytoin.

## ANNEXURE 13

### Whole Bowel Irrigation (WBI)

Whole bowel irrigation refers to the administration of osmotically balanced polyethylene glycol electrolyte solution (PEG-ES) to induce liquid stool and mechanically flush toxins from the GI tract.

### Contraindications to WBI

ileus, bowel obstruction, or intestinal perforation  
clinically significant GI hemorrhage  
hemodynamic instability  
intractable emesis

### Dose

There are no dose-response studies for WBI

*Adults:* A consensus recommendation for adults is 1500–2000 mL/hr WBI is continued until the rectal effluent is clear. Radiographic studies may be useful in some circumstances (e.g., iron ingestion, body packing) to confirm the absence of residual toxins.

## ANNEXURE 14

### Seizures

Seizures caused by dalfampridine (4-aminopyridine), which may respond to phenytoin in addition to benzodiazepines may

be the exception. By extension, other anticonvulsants, such as levetiracetam, are unlikely to be successful in controlling toxin-induced seizures. Seizures caused by certain agents may require specific antidotes for their successful termination like glucose for hypoglycemia, and pyridoxine for isoniazid-induced seizures.

## ANNEXURE 15

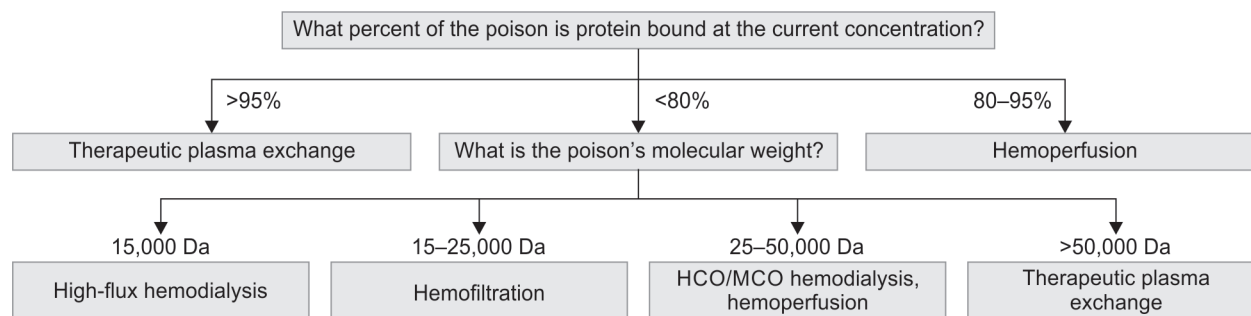
### Extracorporeal Treatment:

Extracorporeal treatment for the management of poisoning is considered if the following criteria are fulfilled:

- Exposure to the poison is likely to cause, serious morbidity and mortality
- Poison toxicity unlikely to be prevented or reversed by an antidote
- Poison toxicity is unlikely to be minimized by treatments that prevent absorption and/or enhance elimination
- Poison's endogenous clearance  $<4$  mL/min/kg
- Volume of distribution  $<1$ – $2$  L/kg

## ANNEXURE 16

Approach for the consideration of an extracorporeal treatment for the management of poisoning.



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