Addiction Intermediate Care Services Program Manual

General Secretary of mental health and addiction treatment in Cooperation with Pompidou Group

Addiction Intermediate Care Services Program Manual

GENERAL SECRETARY OF MENTAL HEALTH AND ADDICTION TREATMENT

COOPERATION WITH POMPIDOU GROUP'S

AICU

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Title of the project:Addiction intermediate care services program
Target health care workers:- psychiatrists, nurses, internists who work in addiction hospitals.

Target hospitals:1) El Matar 2) El Mamoura

Objectives of the activity/action:

-Capacity building of psychiatrists on Addiction intermediate care services and other general healthcare providers on emergency situation in substance use disorders (SUD) to provide the proper levels of observations and medication prescription.
-Raising public awareness on emergency situation in patients of SUD
-Development of model of care to establish intermediate care services program for addiction treatment

Background:

Addictions are challenging health and social problems that need to be addressed to preserve and promote good mental health and ensure that individuals within society lead healthy and productive lives.Tackling addictions is complex and requires communities,Public health, specialist services, and local and nationalgovernment to act in unison and implement evidence-based interventions.
In spite of the impediments, some progress has been made in developing comprehensive patient placement criteria. Because the choice of a treatment setting and intensity of treatment (level of care) are so important, the American Society of Addiction Medicine (ASAM) created the Patient Placement Criteria, Second Edition, Revised (PPC2R) a consensus-based clinical tool for matching patients to the appropriate setting and level of care. The ASAM PPC-2R represents an effort to define how care settings may be matched to patient needs and special characteristics. These criteria currently define the most broadly accepted standard of care for the treatment of substance use disorders. The ASAM PPC-2R describes both the settings in which services may take place and the intensity of services (i.e., level of care) that patients may receive in particular settings. .

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Design and development:

Problem detection :

Current situation: the general secretary of mental health and addiction are currently supervising 18 hospitals all over Egypt, with addiction departments and serve addiction problems. These departments are divided into detoxification ward (patient stays there for 10 days to treat the withdrawal symptoms) and rehabilitation wards (patient stays there for 60 days) and the they work on relapse prevention programs to help patients maintain their recovery.

Unmet needs of our addiction services:

- Absence of units serving patients with complex medical needs and severe complicated withdrawal symptoms.
-Adequate intervening in agitated patients suffering from withdrawal symptoms and psychological disturbance or aggression.
-There are many reviews advocates that the integration of substance abuse treatment with medical care can be effective in reducing both medical problems and levels of substance abuse.
- More clients can be engaged and retained in substance abuse treatment if that treatment is integrated with medical care than if clients are referred to a separate substance abuse treatment program

Consequently this will decrease the load on general hospitals and increase the health wellbeing of the patients and safe their dignity, finally it enhances the cost effectiveness of the service.

GSMH AICU Admission Criteria

In line with the National Minimum Standards for PICU and Low Secure Environments (DoH 2002) and General Secretary of Mental health admission policy & standards; the admission criteria are as follows:

- The symptoms and signs are a direct result of substance misuse/ dependence during intoxication/ withdrawal and not an exacerbation of mental illness and will include the following:

1. Risk of severe withdrawal; detoxification requires frequent & intensive monitoringof alcohol , benzodiazepines , opiates or synthetic cannabinoids that can not be managed in ordinary detoxification units.

2. Substance related Complications (e.g., recurrent seizures or drug reactions) that require medical management.
3. Uncontrolled aggressive behavior or agitation that requires rapid tranquilization.
4. The development of a new symptom (suicide, catatonia, agitation, delirium, EPS, that cannot be controlled in the ward and that needs intermediate care intervention.
5. presence of co morbid medical disorders while in detoxification that requires regular monitoring and intermediate care(eg patients in withdrawal and suffering from renal or liver disease).

- Serious multidisciplinary management strategies well-applied in the transferring ward have not succeeded in containing the presenting problems.
- There must be mutual agreement between the transferring ward physicians and the AICU team on the positive therapeutic benefits expected to be gained from the time limited admission including a clear rationale for assessment and treatment.

I-Approach to the illicit drug overdose patient

This is a general approach to patients with known or suspected acute poisoning from exposure to a wide variety of potentially toxic substances, including medications and recreational drugs.

Successful management of these patients involves adapting:

- The **ABCDE** approach to include toxicological considerations (including expedient recognition of various classic toxidromes,
-performing a toxicology-focused history and physical examination, and tailoring management based on an individualized risk assessment of each patient).
- The risk assessment depends on patient characteristics such as age and comorbidities, as well as characteristics of the exposure, including type, route, dosage, and timing.
- Frequent reevaluation of the patient is essential, since the pharmacokinetics of a substance are altered in situations of overdose, and the clinical presentation can be dynamic as the substance is metabolized.
-The monitoring and disposition requirements and the risk of complications can be estimated through a careful toxicological risk assessment and reassessment.

Initial Management

Management of illicit drug overdose patients has a unique approach because of the challenge in diagnosis and treatment of overdose cases. The approach to these patients must besystematic; initial management is focused on stabilization of life-threatening conditions.

Initial screening examination should be done on all patients to find out immediate abnormal measures which need to be stabilized starting with vital signs, conscious level and pupil size, skin temperature, pulse oximetry, and electrocardiogram.

Patients who are hemodynamically unstable must be kept in continuous cardiac monitoring.

Intravenous access should be done and the blood glucose must be checked especially if the patients have a decreased level of consciousness.

General principles

- Stabilize the patient using an ABCDE approach with toxicology-specific considerations.
- Evaluate for classic toxidromes as well as for signs and symptoms of specific poisonings.
- Specific antidotes may be required.
- Once the patient has been stabilized, perform a toxicological risk assessment.

Anticipate and prepare for changes in hemodynamic and mental status, as drugs are metabolized gradually.

General assessment and interventions

The initial priorities for an illicit drug overdose patient are: securing the airway and breathing and stabilizing the circulation.

Airway& Breathing

- Establish and protect the airway.
- If the patient is unconscious, patency may be maintained by the head-tilt, chin-lift technique (not to be employed in traumatized patients or if neck trauma is suspected) or the classical jaw thrust.

Head tilt/chin lift technique

- The oral cavity should be inspected and any obvious foreign bodies such as food or dentures should be removed.
- Observe any burns or swelling around the nose, mouth, and throat.
- Inspect the nose for foreign bodies, singed nasal hair, or drug remnants.
- Suck out any secretions.
- Airway adjuncts (oro-pharyngeal or naso-pharyngeal airway) or intubation may be necessary.
- Turning the patient to the recovery position allows oral secretions and vomitus in the oro-pharynx to drain out of the mouth.
- If the patient's gag reflex is reduced or absent, he will require intubation.
    - ►► Call the anesthetist.
- Once the airway has been secured, high-flow O_2 should be administered.

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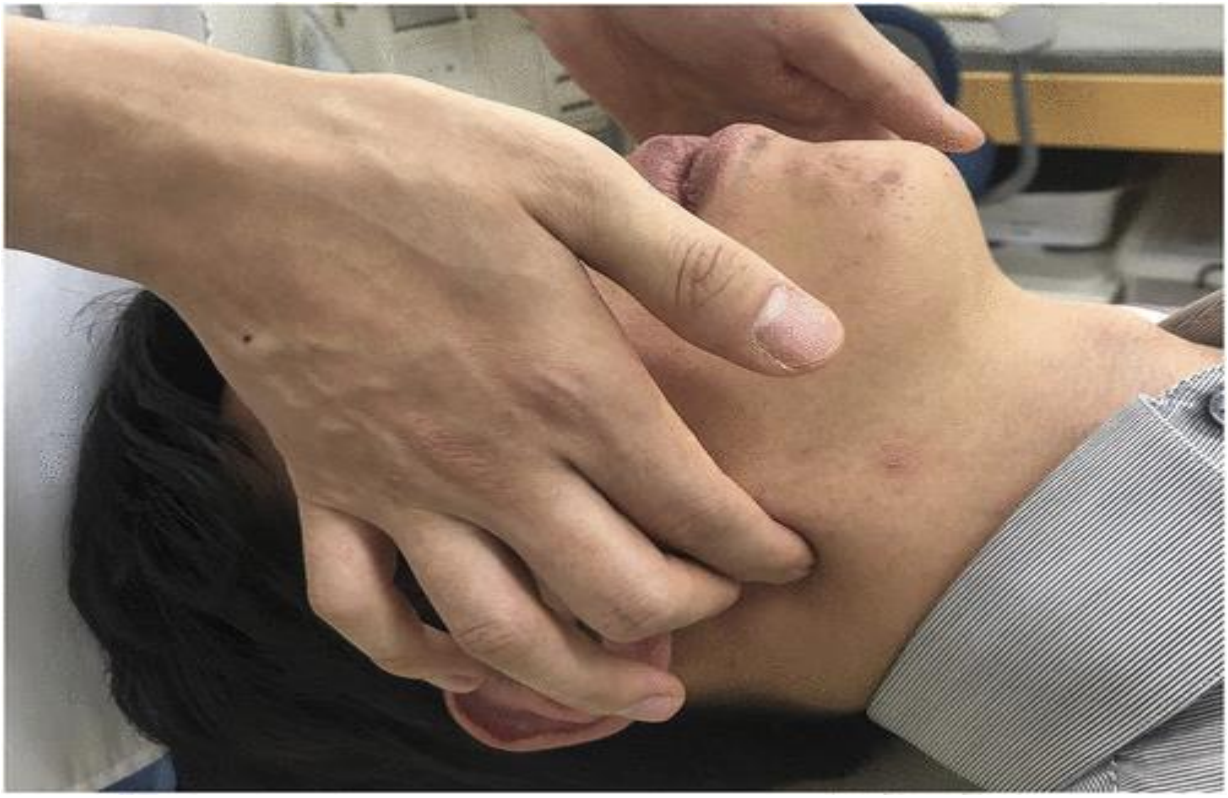

Jaw thrust technique

- Assess breathing; respiratory rate and effectiveness.
    - Respiration may be slowed by opiates, barbiturates, or tricyclic antidepressants.
    - Wheezing may be evident after inhalation of chlorine gas.

CPR - Check Responsiveness on a Child

Look, listen & feel for breathing

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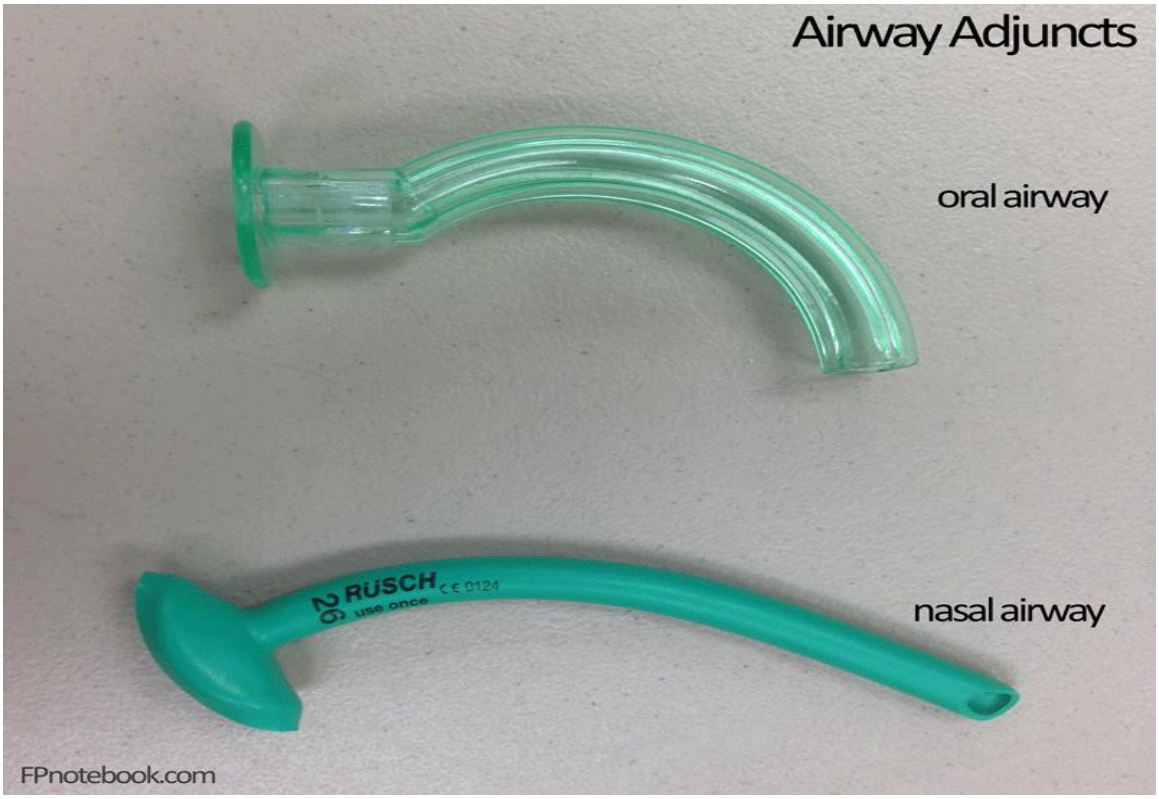
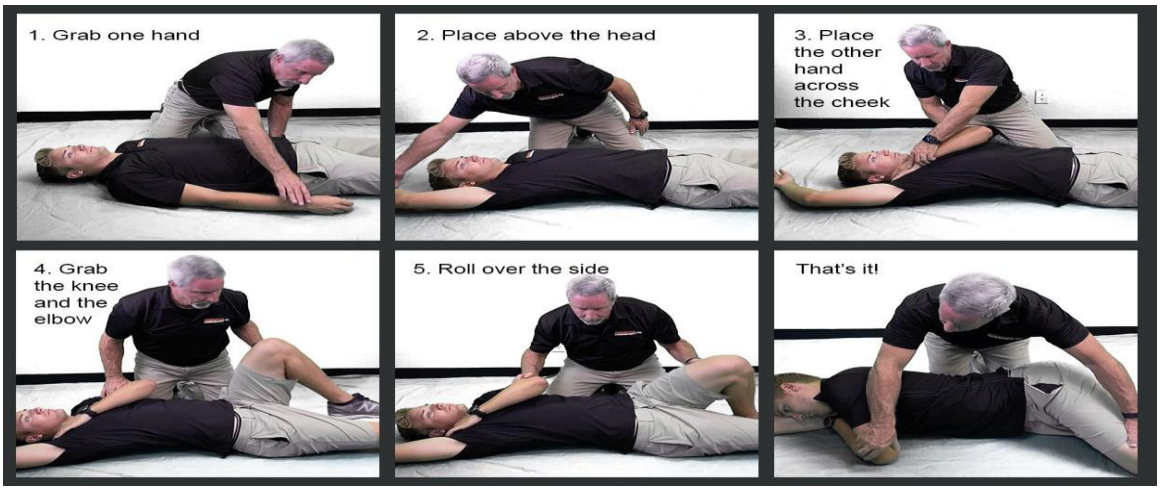


Airway Adjuncts



Recovery position

- Assisted ventilation, either via a bag-valve mask or positive pressure ventilation may be instituted.

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Bag-mask ventilation

- Record O_2 saturations.
- Adequate ventilation and intubation must be done early in the intoxicated patients with depressed mental status, except in cases of easy reversible causes of coma like opioid intoxication or hypoglycemia to prevent complications of intubation like aspiration.
- Other indications for intubation include severe acid-base disturbances or acute respiratory failure. In intubated patients, development of a respiratory acidosis must be prevented by adequate ventilation; in some cases, like high-grade physiologic stimulation, the patient may need sedation and paralysis to prevent complications such as hyperthermia, acidosis, and rhabdomyolysis.

Circulation

- Assessment of circulation should include heart, blood pressure, peripheral circulation and hydration status of the patient.
- Attach the patient to a monitor. Commence meticulous recordings of BP, HR, RR, and O_2 saturations.
- Ideally, the systolic blood pressure should be kept above 90 mmHg.
- Establish venous access using a wide-bore cannula, and collect blood samples for full blood count, group and save, kidney function and electrolytes, coagulation studies, toxicology screening, and also prescribed medication screening.
- If the patient is hypotensive, give IV fluids 10 – 20 mL/kg (crystalloids, colloids). The patient should be maintained in the head-down position. Dopamine and dobutamine may be needed to maintain the BP.
- CVP monitoring may be necessary.
- Observe the skin for cyanosis or fresh needle marks.
- Serum glucose levels should be established, and corrected if abnormal.
- Record a 12-lead ECG.
    - Tricyclic antidepressants can cause tachycardia, tachyarrhythmias, and hypotension.
    - Cocaine can also cause tachyarrhythmias and even MI.
    - Bradycardia may be caused by β-blocker medication.

Neurological monitoring

- Record the GCS score, and make sure that the patient's neurological status is frequently reassessed. Meticulous monitoring and frequent reassessment are crucial in order to detect any further

deterioration in the level of consciousness.
    - ► Remember that changes in the GCS score may be more significant than the overall score.
- Observe pupil size and reaction.
    - Pinpoint pupils may be caused by narcotics.
    - Dilated pupils may be caused by cocaine, amphetamines, atropine, or tricyclic antidepressants.
- Seizures may be caused by withdrawal from drugs or alcohol, but may also be due to poisoning from overdose. Seizures are dangerous, because they cause hypoxia and acidosis and can lead to cardiac arrest. Drugs that may cause seizures in overdose include mefenamic acid, theophylline, and tricyclic antidepressants.
- The best treatment of intoxicated patients with seizures is benzodiazepines; we may add barbiturates if necessary. Phenytoin is not recommended to control seizures in poisoned patients. Do not treat toxic seizures with phenytoin, which can worsen the cardiotoxic effects of certain drugs (tricyclic antidepressants, theophylline, and cocaine) and is ineffective in seizures caused by withdrawal or isoniazid. [16][23]

Specific interventions

- Hypothermia can occur in response to any drug that causes coma, especially barbiturates and phenothiazines. Check the patient's rectal temperature using a low-reading thermometer. Use a warming blanket and warm IV fluids to restore the patient's temperature.
- Elevated temperature (hyperthermia)may be caused by amphetamines, cocaine, Ecstasy, monoamine oxidase inhibitors (MAOIs), and theophylline, serotonin syndrome, or neuroleptic malignant syndrome. Convulsions or seizures are common.Hyperthermiamust be treated aggressively to prevent complications like rhabdomyolysis, organ failure, and disseminated intravascular coagulation. Treatment of hyperthermia includes active cooling like ice water immersion; if active cooling is ineffective, the patient may need sedation, neuromuscular paralysis, and intubation.

Modifications to the ABCDE approach

ABCDE approach: toxicology-specific considerations [1][2][3][4]

	Alterations and possible causes	Management

Airway	• Airway obstruction or injury
	  ○ Caustic agents
	  ○ Toxic inhalation injuries
	  ○ Toxic seizures
	• ↑ Risk of aspiration or bronchial obstruction
	  ○ Loss of airway protective reflexes
	  ○ Excessive vomiting or hematemesis
		• Airway obstruction
		  ○ Caustic or inhalation injury: high risk of difficult airway
		  ▪ Call for help: e.g., anesthesia
		  ▪ Perform intubation as soon as possible
		  ○ Uncontrollable seizures: Abort convulsive activity and perform rapid sequence intubation.
		• Loss of airway protection
		  ○ Begin basic airway maneuvers.
		  ○ Consider early intubation for patients expected to deteriorate with:
		  ▪ Severely depressed mental status or coma
		  ▪ ↑ Risk of aspiration: e.g., excessive vomiting

ABCDE approach: toxicology-specific considerations [1][2][3][4]

	Alterations and possible causes	Management
		▪ ↑ Risk of status epilepticus • Transient airway compromise (e.g., post-ictal period): Consider basic airway maneuvers alone with close airway monitoring.
◦ Breathing	• ↓ RR ◦ Opioids ◦ Sedative-hypnotics • ↑ RR or Kussmaul respirations ◦ Stimulant (amphetamine cocaine) ◦ Acute salicylate ingestion ◦ Compensation for toxin-induced metabolic acidosis (e.g., toxic alcohols) ◦ Aspiration pneumonia	• All patients ◦ Start SpO_2 monitoring and provide oxygen therapy as needed. ◦ Begin bag mask ventilation if signs of respiratory failure. ◦ Consider ABG/VBG to screen for acid-base disorders. • CO toxicity ◦ Administer high-flow 100% O_2. ◦ Interpret pulse oximetry with caution in patients with CO toxicity • Opioid-induced respiratory depression or respiratory arrest: administer naloxone. ◦ The ideal dosage of IV naloxone for in-hospital settings is

ABCDE approach: toxicology-specific considerations [1][2][3][4]

	Alterations and possible causes	Management
		unclear; follow local protocol or dose each patient individually ◦ If no IV access, consider: ▪ IM naloxone ▪ Intranasal nal oxone • Consider intubation and mechanical ventilation for: ◦ Respiratory failure unresponsiv e to antidotes (e.g., n aloxone) ◦ Significant acidemia and evidence of respiratory muscle fatigue call for help (e.g., anesthesia)
Circulation	• Hypotension: opioi ds, digoxin, antihypertensives • Hypertension ◦ Central neurological complication (e.g., cocaine - associated str oke) ◦ Sympathomi	• All patients ◦ Start continuous cardiac monitoring and consider hemodyna mic monitoring for patients with shock. ◦ Establish adequate IV access. ◦ Provide immediate hemodynamic support as needed (e.g., IV fluid

ABCDE approach: toxicology-specific considerations [1][2][3][4]

	Alterations and possible causes	Management

	metics
	• Rhythm
	  ◦ Bradycardia: beta blockers, CCBs
	  ◦ Narrow complex tachycardia: vasodilators, sympathomimetics
	  ◦ QRS widening and wide complex tachycardia: sodium channelblockers (e.g., TCAs, antiarrhythmics)
		resuscitation)
		• Toxin-induced bradycardia
		  ◦ Give high-dose atropine for muscarinic cholinergic symptoms
		  ◦ Consider temporary cardiac pacing.
		• Toxin-induced tachyarrhythmias
		  ◦ Consider benzodiazepines (e.g.,
		  ◦ lorazepam) if stimulants are suspected.
		  ◦ Administer sodium bicarbonate for severe sodium channel blocker toxicity (e.g., TCA toxicity)
		• Toxin-induced hypotension: typically requires treatment with adrenergic vasopressors
		  ◦ For negative inotropes: Epinephrine is preferred
		  ◦ For peripheral vasodilators: Norepinephrine is preferred

ABCDE approach: toxicology-specific considerations [1][2][3][4]

	Alterations and possible causes	Management
		• Cardiovascular drug toxicity: often associated with refractory arrhythmias and shock ◦ Examples: beta-blocker toxicity, CCB toxicity, cardiac glycoside toxicity ◦ Consider toxin-specific antidotes in addition to immediate hemodynamic support, such as: ▪ High-dose insulin therapy (with regular insulin) ▪ IV calcium: calcium chloride OR calcium gluconate ▪ Digoxin-immune fab ◦ Consider ECMO for refractory life-threatening cases.
Disability	• Pupillary changes: examine closely for mydriasis and miosis • Hypoglycemia: insulin and oral	• Altered mental status ◦ Do not administer a “coma cocktail” empirically, rather consider each antidote on an

ABCDE approach: toxicology-specific considerations [1][2][3][4]

	Alterations and possible causes	Management

	hypoglycemics
	• Toxic seizures
	  ○ Insulin and oral hypoglycemics
	  ○ Antidepressants
	  ○ Sympathomimetics
	  ○ Lead
	  ○ Lithium
	  ○ Isoniazid
	• Withdrawal seizures: e.g., from alcohol, benzodiazepines
		individual basis
		  ○ Consider naloxone for opioid-induced coma
		  ○ Give $D_{50}W$ for hypoglycemia.
		  ○ Give thiamine if risk factors present for Wernicke encephalopathy (e.g., malnourishment, alcohol use disorder)
		  ○ Reevaluate mental status frequently
		• Toxic seizures
		  ○ First-line: benzodiazepines (e.g., lorazepam)
		  ○ Second-line: barbiturates (e.g., phenobarbital)
		  ○ Neurology consultation is advised

Exposure	• Hyperthermia	• Hyperthermia
		  ○ Discontinue causative agent
		  ○ Begin active cooling, e.g., mist and fan

Classic toxidromes

Recognition of classic toxidromes is essential to the evaluation of patients poisoned with an unknown substance. Note that, in practice, toxidromes may manifest more subtly than described here.

Classic toxidromes [2][3][13]

Class of drug	Vital signs	Mental status	Pupils	Other examination Findings
Sedative-hypnotics	Hypothermia ↓ HR ↓ RR ↓ BP ↓ SaO2	Sedation, stupor, coma	Poor reactivity to light	Hypotonia, hyporeflexia Slurred speech
Opioids			Miosis	Decreased bowel sounds
Cholinergics (muscarinic)	↓ HR Variable RR ↓ BP ↓ SaO2	Can be altered or normal	Miosis	Wheezing/bronchospasm Signs and symptoms of ↑secretions (bronchorrhea, salivation, lacrimation, urination, defecation, vomiting, sweating) Gastrointestinal cramps DUMBBELLSS
Cholinergics (nicotinic)	↑ HR ↑ BP		Normal	Muscle fasciculations and weakness Abdominal pain
Anticholinergics	Hyperthermia ↑ HR	Delirium	Mydriasis	Dry, hot skin Ileus Urinary retention
Serotonin	Hyperthermia ↑ HR ↑ RR ↑/↓BP (Variability in BP is a feature of	Variable Agitation, confusion OR drowsiness, coma	Mydriasis	Sweating Neuromuscular hyperactivity(i.e., clonus, myoclonus, hyperreflexia, tremor, ataxia) Diarrhea If severe: seizures, rhabdomyolysis,

Classic toxidromes [2][3][13]

Class of drug	Vital signs	Mental status	Pupils	Other examination Findings
	autonomic instability.)			AKI, and DIC
Sympathomimetics	Hyperthermia ↑ HR ↑/↓ BP	Agitation, confusion		Sweating Psychosis Seizures

In patients taking serotonergic medications, clonus and hyperreflexia should raise suspicion for serotonin syndrome. [24]For patients with anticholinergic syndrome, remember: blind as a bat, mad as a hatter, red as a beet, hot as a hare, and dry as a bone!

Risk assessment

- **Goal of risk assessment**
  - Categorize the risk presented by a drug exposure along the following spectrum (from high to low):
    - Immediate threat to life and/or cognitive function
    - Potential for permanent organ damage
    - Potential for developing a complication(e.g., seizures, cardiac arrhythmias) that could increase the risk level
    - Uncertain risk (further monitoring is required)
    - Low risk (e.g., does not meet the threshold of toxic ingestion)
  - Guide interventions that help convert:
    - Potentially fatal toxic exposures to nonfatal toxic exposures
    - Potentially toxic exposures to nontoxic exposures
- **Decisions affected by risk assessment**
  - Antidote use: indications, risk-benefit analysis, dosing
  - Supportive care requirements: hemodynamic and metabolic support, necessary consults
  - Monitoring requirements: airway, cardiac, neurological
  - Disposition: discharge from ED, ward admission, ICU admission, interfacility transfer

Approach [3][16]

Risk assessment does not involve a specific scoring system but instead refers to a conceptual process based on the overall clinical evaluation.

- All patients: Perform focused toxicological history and physical examination
- Diagnostics
  - Obtain a limited set of routine studies for most patients.
  - Consider additional laboratory studies and imaging for specific scenarios, such as:
    - Refining the diagnosis
    - Identifying or evaluating complications or abnormal results of routine studies
    - Guiding further management, for example:
      - Determining the need for enhanced elimination or a particular antidote
      - Monitor the response to treatment.

While some substances (e.g., those with a narrow therapeutic window) inherently have more toxic potential than others, the dose of the substance is a primary determinant of the clinical effects seen. In other words: “The dose makes the poison.”

Focused toxicological history and physical examination [3][13][16]

- **Sources of information**
  - Obtain as much information directly from patients as possible, reassuring them about confidentiality. (e.g., regarding the use of illicit substances)
  - Seek collateral sources of information if the patient is unable or unwilling to answer questions, and/or there are inconsistencies between the history and physical examination.
    - Family/friends
    - Chart review or pharmacy
    - Witnesses or bystanders
- **Key historical elements**
  - Drug-related: e.g., drug class, immediate vs. extended-release formulation, amount, time of ingestion [3][16]
  - Patient-related: e.g., age, comorbidities, clinical status
  - Attempt to quantify the toxic dose ingested per kg of weight.
  - Consider the possibility of multiple co-ingested substances.

- **Key physical examination elements**
  - Examination of the skin, eyes, abdomen, and neurological system
  - Identification of classic toxidromes
  - Identification of cardinal signs of specific drugs

Clinical effects of a given substance at toxic (supratherapeutic) doses can vary dramatically from the expected side effects at therapeutic doses.

Focused toxicological history [3][13][16]

Questions	Description

Who?	• Patient characteristics: confer an increased risk
	  ◦ Older age (≥65 years)
	  ◦ Comorbidities (e.g., obesity, CKD, cirrhosis, seizure disorder)
	  ◦ Current clinical status (e.g., symptomatic, hemodynamically unstable, worsening)

What?	• Exposure characteristics: confer an increased risk
	  ◦ High dose
	  ◦ High toxicity (e.g., narrow therapeutic index)
	  ◦ Extended-release formulation
	  ◦ Any co-ingestions
	• Unknown toxin: attempt to identify by asking about:
	  ◦ All recently prescribed medications
	  ◦ Any non-prescribed medications, supplements, herbals, etc.
	  ◦ Occupation and hobbies
	  ◦ If bottles are found, do not rely solely on labels, since patients may use bottles to store other medications

How?	• Route of exposure: e.g., oral, intravenous, transdermal, rectal

When?	• Important times to document
	  ◦ Exact time and duration of exposure
	  ◦ Time elapsed since exposure
	  ◦ Time of symptom onset

Why?	• Unintentional exposure
	  ◦ Iatrogenic: e.g., incorrect dose prescribed or given
	  ◦ Patient-related: e.g., misunderstanding regarding prescribed dose, inability to read or understand the bottle label, new or worsening cognitive disorder.
	• Intentional exposure
	  ◦ Self-harm or suicide attempt: Identify risk factors for serious intent [15]
	  ▪ Overdose attempt made in an isolated place

Focused toxicological history [3][13][16]

- Suicide note
- Past medical history: e.g., terminal illness, history of depression
- Recent bereavement
- Sociodemographic factors: e.g., male gender, older age, unemployment

- Harm by another (e.g., date rape, elder abuse, child abuse): Evaluate safety of patient's current living situation.

Reevaluate the clinical hypothesis if physical findings and diagnostic studies are inconsistent with toxic effects that are expected from the history of the exposure.

Focused toxicological physical examination [3][13][16]

Examination	Description
Weight	• Accurate weight: important for risk assessment and for the dosing of certain antidotes.
Skin	• Hyperthermia: anticholinergic poisoning, cocaine, malignant neuroleptic syndrome • Lesions, bruises: may be due to prolonged immobilization (e.g., from falls related to sedative use) • Moisture (sweating): cholinergic or sympathomimetic poisoning, serotonin syndrome

Eyes and mucous membranes	• Pupil size: See “Classic toxidromes.”
	• Eye movements
	  ○ Strabismus and ophthalmoplegia: tricyclic antidepressants, barbiturates, phenothiazines, anti-epileptics (e.g., phenytoin, carbamazepine)
	  ○ Nystagmus: sedatives, anti-epileptics, ketamine, phencyclidine
	• Blurring or loss of vision, tunnel vision: methanol, quinine
	• Mucous membranes
	  ○ Blueish: cyanosis, methemoglobinemia
	  ○ Yellowish: drug-induced liver injury, drug-induced hemolytic anemia

Focused toxicological physical examination [3][13][16]

Abdomen	• ↓ Bowel sounds: anticholinergic toxidrome, opioid toxicity • ↑ Bowel sounds: cholinergic toxidrome, serotonin toxicity • Bladder distension: anticholinergic toxidrome
Neurological exam	• General mental status: e.g., depressed, delirious, or anxious • Abnormal movements ◦ Acute dystonia: dopamine receptor antagonists (e.g., metoclopramide, antipsychotics) ◦ Tremor: intoxication, withdrawal • Reflexes ◦ Hyperreflexia: tricyclic antidepressants ◦ Hyporeflexia: sedatives ◦ Clonus: serotonin syndrome • Tone ◦ Hypertonia: tricyclic antidepressants ◦ Hypotonia: sedatives ◦ Rigidity: neuroleptic malignant syndrome

Reassess the patient frequently! Examination findings can be dynamic as the toxin metabolizes.

Intoxication with certain substances can cause the loss of some brainstem reflexes. Multiple society guidelines state that diagnosis of brain death can only be made in the absence of intoxication. [25]

Diagnostics [2][3][15][16]

- Investigations should be guided by history and examination findings.
- Clearly document the time blood was drawn, so that results can be accurately interpreted.
- General serum or urine screening panels for multiple toxins are not routinely recommended, because: [2][3]
  - They do not include all toxins.
  - Results often do not return in time to affect acute management.
  - Both false-negative and false-positive results can occur.
  - Drugs or their metabolites may be detected in urine for days after any clinical symptoms have resolved; therefore, results may not explain the current presentation. [3]

Abnormalities (e.g., metabolic acidosis, other metabolic derangements, elevated liver enzymes) increase the risk of complications; treat appropriately and consider extended observation, admission, and involvement of critical care as necessary.

Routine tests

- Basic metabolic panel (BMP)
  - Electrolyte abnormalities could be:
    - Hyponatremia (e.g., due to 3,4-Methylenedioxy methamphetamine)
    - Hyperkalemia
    - Hypokalemia
  - Hypoglycemia (e.g., due to insulin and/or oral hypoglycemics)
  - Acute kidney injury (e.g., due to ethylene glycol or rhabdomyolysis) [3]
- Liver chemistries: may be deranged in acetaminophenoverdose or alcohol intoxication
- Acetaminophen level: the only specific toxin routinely screened [2]
- ECG [16][24]
  - Bradycardia and atrioventricular block (e.g., due to digoxin, beta blockers, or calcium channel blockers)
  - QRS prolongation and right axis deviation (e.g., due to tricyclic antidepressants)
  - QT prolongation (e.g., due to citalopram, antipsychotics)

Additional testing

- ABG: to help identify acid-base disorders
- Lactate and/or ketones: to further evaluate metabolic acidosis
- CPK: for suspected rhabdomyolysis

Imaging [3][24]

There is no indication for routine imaging in intoxicated patients, but the following studies may be of use in certain situations.

- X-ray chest: Consider if there is concern for pulmonary complications (e.g., aspiration, ARDS). [24]
- CT head: Perform routinely for patients with altered mental status that is not clearly attributable to a specific toxic exposure. [3]
- CT or MRI esophagus: Consider if there is suspicion for esophageal caustic injury.
- X-ray or CT abdomen: Consider if there is concern for ingestion of select radiopaque substances, e.g.: [26]
  - Packets containing substances such as opiates or cocaine [3]

- Chloral hydrate
- Phenothiazines
- Numerous sustained-release or enteric-coated substances
- Numerous industrial solvents (e.g., carbon tetrachloride)

To remember foreign substances with a radiopaque appearance on abdominal radiography, think of (**CHIPES**): Chloral hydrate, Heavy metals, Iodides, Phenothiazines, Enteric-coated or sustained-release substances, and Solvents. [26]

❖ **Supportive care for specific cases:**

Aggressive supportive care is essential to the successful management of illicit drug overdose patients, irrespective of the need for other interventions (e.g., antidotes).

❖ **Cardiorespiratory defect**[4][15]

- Manage persistent hypotension: Ensure adequate fluid resuscitation and consider vasopressors.
- Consider serial ECGs and continuous cardiac monitoring if:
  - The ingested substance was cardiotoxic (e.g., calcium channel blockers, digoxin)
  - Multiple substances were ingested
  - The ingested substance is unknown
- For patients with rhythm disturbances, monitor the following: [14]
  - QRS and QT intervals with serial ECGs (e.g., every 2–4 hours)
  - Serum electrolytes: Maintain K^+ levels >4 mEq/L and Mg^{++} levels >2 mg/dL.
  - Acid-base status: Correct metabolic acidosis.
- Provide oxygen therapy; consider mechanical ventilation as needed to optimize gas exchange.

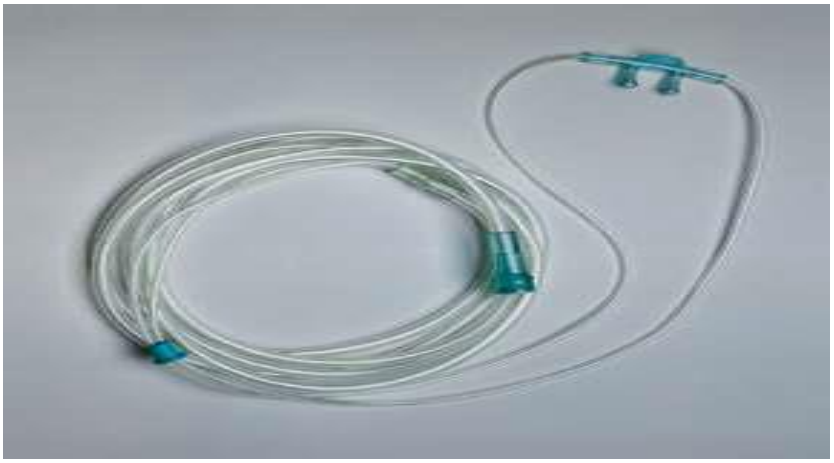
- **OxygenDelivery Devices**

❖ **Nasal Cannula**

✓ Recommended in the Guideline as suitable for most patients with both type I and II respiratory failure.

✓ 2-6L/min gives approximately 24-50% FiO_2.

❖ **Simple face mask**



- ✓ Used for patients with type I respiratory failure.
- ✓ Delivers variable O_2concentration between 35% & 60%.
- ✓ Flow 5-10 L/min.
- ✓ Flow must be at least 5 L/min to avoid CO2 build up and resistance to breathing.

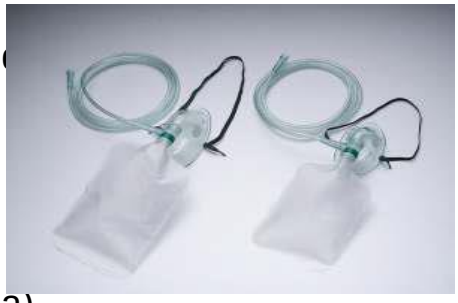
❖ **Venturi System**

Oxygen %	Flow setting
24	2 L/min
28	4 L/min
31	6 L/min
35	8 L/min
40	10 L/min
60	12 L/min

- ✓ Best for controlled oxygen therapy (you can set the exact %02 you want).
- ✓ It is therefore the method of choice for managing type 2 respiratory failure.
- ✓ Less convenient for eating and drinking.
- ✓ May require high flow circuit to guarantee desired percentage.

❖ **Non-rebreathe system**

- ✓ Reservoir of oxygen.
- ✓ One-way valve to prevent inspiration an air.
- ✓ Requires flow of 15L per minute.



❖ **Metabolic defect** [4][15][44]

- Correct electrolyte derangements

(e.g., hypokalemia, hypomagnesemia, hyponatremia).

    - Manage severe metabolic acidosis.
        - Consider administration of IV sodium bicarbonate in a central line.
    - Manage hypoglycemia.
        - Encourage oral carbohydrate intake and ensure resolution of hypoglycemia.
        - If the patient is unconscious: IV 50% dextrose in water
        - If insulin or sulfonlyurea-related: Consider a continuous dextrose infusion (e.g., 10% dextrose in 0.9% NaCl).
        - Monitor glucose and potassium levels.
        - Consider prophylactic dextrose in patients with salicylate toxicity to avoid cerebral hypoglycemia.
- **Temperature (hyperthermia)** [4][15]
    - If core temperature is >39°C: Use active cooling techniques.
    - If due to sympathetic stimulation: Use benzodiazepines (e.g., lorazepam).
    - If resistant to cooling measures: Consult toxicologist for advanced treatment strategies.
- **Consults**
    - Consult anesthetist and critical care early.
    - Substance abuse: Refer for counseling or rehabilitation if patient agrees.

Monitoring and disposition

- **Duration of observation** [3]
    - May be limited to 6 hours for intentional ingestion, if:
        - Peak toxicity is expected to be reached within that time
        - Overall level of toxicity is predicted to be low
        - Patient remains asymptomatic
        - Patient has received a psychiatric consult
    - May be longer (>24 hours) in the following situations:
        - Substance-related: extended-release formulation, delayed peak effects, delayed toxicity, or active metabolites. [42]
        - Patient-related: Symptoms do not resolve with supportive treatment or complications occur.
    - Consider the need for serial drug levels: for drugs with unpredictable absorption kinetics (e.g., salicylates, valproic acid) [3]
    - Monitor for complications, including: [4]

- Rhabdomyolysis (due to direct toxic effects, resulting seizures, or prolonged hyperthermia)
- Urinary retention (due to anticholinergic effects)

In overdose, the pharmacokinetics of drugs are altered: The elimination half-life is not the same as when the drug is administered at therapeutic levels.

❖ **Supportive care for hepatic patients**

- **Identify acute liver failure and Its Causes**
  - In a clinical setting, hepatic injury is usually recognized by appearance of jaundice, and liver failure is recognized by occurrence of encephalopathy, ascites, and coagulopathy.
  - While initial supportive therapy is being given, diagnostic workup should be sent. This includes the following:
    - Complete blood count, blood glucose, blood urea nitrogen, creatinine, electrolytes,liver function tests, and prothrombin time.
    - Arterial blood gases, arterial ammonia and lactate.
    - Chest X-ray, ECG.
    - Endotracheal aspirate for aerobic culture in intubated patients, blood culture andurine culture.
    - Serology including HBsAg, IgM anti-HBc, IgM anti-hepatitis E virus (HEV), IgM anti-hepatitis A virus (HAV), anti-hepatitis C virus (HCV),anti-hepatitis D virus (HDV), and human immunodeficiency virus (HIV) serology.
    - Copper studies—serum Ceruloplasmin.
    - Autoimmune markers—Antinuclear Factor/LKM antibody.
    - Bedside abdominal ultrasound.

Broad categories
Infections
Metabolic diseases
Drugs
Toxins
ALF of pregnancy
Autoimmune hepatitis
Acute Budd–Chiari syndrome
Shock liver
Individual etiological agents
Hepatotropic viruses (A to E)
Cytomegalovirus, herpes simplex virus
Wilson's disease, galactosemia
Paracetamol, isoniazid, rifampicin, sodium valproate
Amanita phalloides

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Causes of fulminant hepatic failure

Test	Possible clinical implication of abnormality	Specificity for liver disease
Alanine aminotransferase	Hepatocellular damage	Reasonably specific when >3× ULN (low concentrations in tissues other than liver, *e.g.*, skeletal muscle)
Aspartate aminotransferase	Hepatocellular damage	Not specific (skeletal muscle, heart, pancreas, blood)
Total bilirubin	Cholestasis, impaired uptake, conjugation or excretion, biliary obstruction, haemolysis	Not specific. Two forms: indirect (unconjugated) and direct (conjugated)
Alkaline phosphatase	Cholestasis, infiltrative disease, biliary obstruction	Not specific (bone, salivary glands, intestinal, biliary)
Gamma-glutamyltransferase	Cholestasis, biliary obstruction	Not specific (kidney, liver, pancreas, GI tract, lung)
Glutamate dehydrogenase	Hepatocellular (mitochondrial) damage	Specific, helpful to differentiate muscular from hepatic injury
Albumin	Impaired hepatocellular function	Malnutrition, nephrotic syndrome, cirrhosis (any cause)
International normalized ratio	Impaired hepatocellular function	Vitamin K deficiency; anticoagulants
Creatine kinase	Muscular injury	Crucial to differentiate muscular from hepatic injury

GI, gastrointestinal; ULN, upper limit of normal.

Standard liver biochemistry to assess suspected drug-induced liver injury

Disease	Assessment
Hepatitis A, B, C, E	IgM anti-HAV; HBsAg, IgM anti-HBc, HBV DNA; anti-HCV, HCV RNA, IgM & IgG anti-HEV, HEV RNA
CMV, HSV, EBV infection	IgM & IgG anti-CMV, IgM & IgG anti-HSV; IgM & IgG anti-EBV
Autoimmune hepatitis	ANA & ASMA titres, total IgM, IgG, IgE, IgA
Alcoholic hepatitis	Ethanol history, GGT, MCV
Non-alcoholic steatohepatitis	Ultrasound or MRI
Hypoxic/ischaemic hepatopathy	Medical history: acute or chronic CHF, hypotension, hypoxia, hepatic venous occlusion. Ultrasound or MRI
Biliary tract disease	Ultrasound or MRI, ERCP as appropriate.
Wilson disease	Ceruloplasmin
Hemochromatosis	Ferritin, transferrin saturation
Alpha-1-antitrypsin deficiency	Alpha-1-antitrypsin

ANA, anti-nuclear antibody; ASMA, anti-smooth muscle antibody; CD, carbohydrate deficient; CHF, congestive heart failure; CMV, cytomegalovirus; DILI, drug-induced liver injury; EBV, Epstein-Barr virus; ERCP, endoscopic retrograde cholangiopancreatography; GGT, gamma-glutamyltransferase; HAV, hepatitis A virus; HBV, hepatitis B virus; HCV, hepatitis C virus; HEV, hepatitis virus; HSV, herpes simplex virus; Ig, immunoglobulin; MCV, mean corpuscular volume; MRI, magnetic resonance imaging.

Exclusion of underlying diseases in drug-induced liver injury diagnosis

- **Assess the grade of encephalopathy**

Stage	Mental status	Neuromuscular function
1	Impaired attention, irritability, depression	Tremor, incoordination, apraxia
2	Drowsiness, behavioral changes, memory impairment, sleep disturbances	Asterixis, slowed or slurred speech, ataxia
3	Confusion, disorientation, somnolence, amnesia	Hypoactive reflexes, nystagmus, clonus, muscular rigidity
4	Stupor and coma	Dilated pupils and decerebrate posturing, oculocephalic reflex

Clinical stages of hepatic encephalopathy

- **General supportive measures**
  - Correct fluid status and avoid hypo- or hypervolemia.
  - Strict aseptic precautions should be practiced while handling catheter and tubes.
  - Administer supplemental oxygen in case of hypoxemia and avoid hypercapnia.
  - Avoid hypertension/hypotension.
  - Manage fever with surface cooling.

- Neck should be kept in neutral position.
- Minimize external stimuli.
- Monitor blood glucose 2 hourly and maintain between 140 and 180 mg%.
- Monitor serum electrolytes and maintain corrected levels.
- Nutrition—nasogastric feeding should be started early with continuous infusion, with aspiration precaution and with gradual increase in protein supplementation.
    - Normal protein diet for episodic hepatic encephalopathy
    - 1–2 g of protein per kg/day
    - Zinc replacement
- Reduction in nitrogenous load arising from the gut. Non-absorbable disaccharides—lactulose is a first-line pharmacological treatment for hepatic encephalopathy. Lactulose should be given to have two to three loose stools per day.
- Strict aseptic precautions should be followed while handling the lines and catheters.

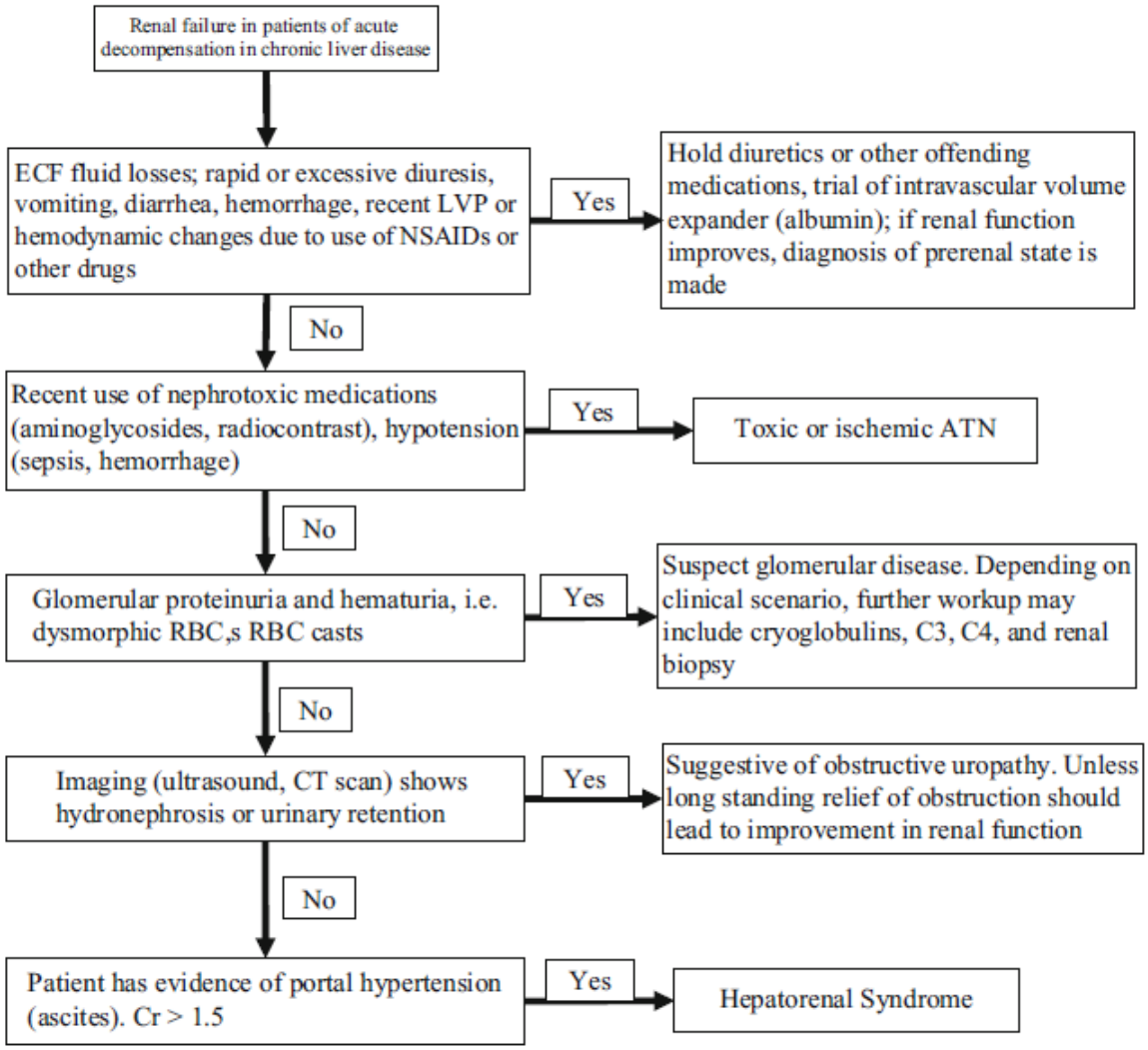
❖ **Supportive care for renal patients**

- **Differentiate urinary retention from oliguria**
    - By definition, oliguria is less than 0.5 mL/kg urine output for at least 2 h.
    - Perform suprapubic percussion for bladder fullness in all cases of low urine output to exclude retention of urine.
    - Sudden drop of urine output, no urine or fluctuating levels of urine output in a catheterized patient who is otherwise stable, may indicate a partial or complete catheter block with clot or debris or per catheter leak. Ascertain this by physical examination, bladder wash, or replacing the catheter.
    - Bedside ultrasonography differentiates retention from oliguria and at the same time confirms the catheter position.
- **Send biochemical investigations to ascertain severity and cause of acute kidney injury (AKI)**
    - Serum chemistry including sodium; potassium; creatinine; blood urea nitrogen (BUN); calcium; magnesium; phosphate; uric acid; creatine phosphokinase (if rhabdomyolysis is suspected); total protein, albumin, globulin, and unconjugated bilirubin (to exclude hemolysis); and lactate dehydrogenase

(LDH) should be checked.
    - Serum and urine protein electrophoresis should be performed in patients with bone pain, hypercalcemia, and hyperglobulinemia where paraproteinemia is suspected.
    - The usual urea–creatinine ratio is 10:1. An unusually high urea–creatinine ratio is suggestive of volume depletion, gastrointestinal bleeding, catabolic state, corticosteroid use or high protein feed.
    - A high creatinine–urea ratio is associated with rhabdomyolysis, diabetic ketoacidosis or may indicate chronic kidney disease (CKD).
    - Assess the renal function
        - Creatinine of more than 1.5 mg/dL is considered renal failure.
        - Creatinine values should be interpreted with caution especially in those patients with ascites due to an overestimation of values.
        - Definition and stages of AKI should be as follows: Increase in serum creatinine >0.3 mg/dL within 48 h or a percentage increase >50% from the baseline values (baseline serum creatinine value to be obtained in previous 3 months whenever available in patients where multiple values are available, value close to admission to be taken).
    - Staging of AKI should be as follows:
        - Stage I AKI—increase in serum creatinine >0.3 mg/dL or increase in serum creatinine >1.5 to 2 folds above the base line.
        - Stage II AKI—increase in serum creatinine >2 to 3 folds.
        - Stage III AKI—increase in serum creatinine >3 folds from the baseline or serum creatinine >4 mg/dL or initiation of renal replacement therapy.
- **Monitor the patient carefully**
    - Ensure continuous monitoring of urine output, by placing an indwelling urinary catheter.
    - Continuous monitoring of hemodynamic parameters (CVP and arterial line) is also mandatory.
    - Intra-abdominal pressure (IAP) monitoring is very important, especially when large volumes of fluids or blood products are

infused, as they may third space into the peritoneal cavity if there is capillary leak due to systemic inflammatory response syndrome (SIRS) after trauma, sepsis, or abdominal surgery.
    - IAP of less than 12 mmHg indicates normal condition, 12–20 mmHg indicates intra-abdominal hypertension, and more than 20 mmHg with organ dysfunction indicates abdominal compartment syndrome.
- **General supportive measures**
    - Management depends on the type of injury. If there is an obvious precipitating factor like volume depletion, it should be corrected. Nephrotoxic drugs should be stopped, and diuretics should be withheld. If there is sepsis, appropriate antibiotics should be used.
    - Maintain renal perfusion pressure.
    - Maintain mean arterial pressure (MAP) of more than 65 mmHg by adequate volume loading and with vasopressors if necessary. MAP may have to be kept higher if the patient is hypertensive or has a high IAP.
    - Invasive hemodynamic monitoring (arterial line and central line) is usually needed in these cases.
    - There is no role of renal dose of dopamine to increase renal perfusion.
    - Dobutamine should be used to optimize cardiac output, provided there is no tachycardia or arrhythmia.
    - A Furosemide challenge test, after a reasonable correction of volume status, by administering 1–1.5 mg/kg of Furosemide bolus may help in identifying AKI. Urine output of <200 ml in 2 h of the diuretic challenge is indicative of need for RRT. The sensitivity and specificity of this test for need of RRT is around 80%. This test should not be performed in the presence of clinical hypovolemia and is not a screening tool to identify AKI. Its main role is to ascertain severity of tubular dysfunction in AKI and need for RRT. This should be used in conjunction with clinical parameters and renal biomarkers where available.
    - Look for and manage metabolic abnormalities, which may be a result of renal impairment such as hyperkalemia, hyper/hyponatremia, and hypocalcemia.
    - Look for causative factors such as hypercalcemia or hyperuricemia.

- Frequent monitoring of electrolytes may be necessary.
- If rhabdomyolysis is suspected, the maintenance of urinary pH to more than 7 by systemic alkalinization is indicated.
- Avoid any potentially nephrotoxic agent
- In high-risk cases, along with hydration with 0.9% saline, N - acetyl cysteine at a dose of 1200 mg twice per day may be administered for 3 days from a day prior to elective radiocontrast imaging study.
- Avoid nephrotoxic antibiotics. Aminoglycosides, if used, should be dosed once daily.



Evaluation and management of renal failure

❖ **Summary of acute management checklist**

- Perform an ABCDE approach with toxicology-specific considerations.
  - Consider intubation for airway protection.
  - Provide oxygen therapy and mechanical ventilation as needed.
  - Provide immediate hemodynamic support as needed.

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- Identify classic toxidromes or signs of specific poisoning.
- Administer antidotes for immediate threats to life
  e.g., naloxone, atropine, dextrose.
- Identify and treat life-threatening complications: e.g., cardiac arrhythmias, seizures.
- Consult critical care as needed.
- Provide aggressive supportive care:
  - IV fluid therapy
  - Correction of electrolyte and metabolic derangements.
  - Maintenance of normothermia
- Perform toxicological risk assessment.
- Obtain focused toxicological history and physical examination.
  - Obtain collateral history as needed (e.g., EMS, family, medical records)
  - Quantify amount, time, and route of toxic exposure(s).
  - Determine suicidal risk of patients with intentional exposure.
- Obtain routine studies (BMP, liver
  chemistry, acetaminophen level, ECG).
- Consult a toxicologist or poison center for input as needed.

Management to consider based on toxicological risk assessment

- GI decontamination: e.g., activated charcoal
- Enhanced elimination techniques: e.g., hemodialysis
- Antidotes: e.g., N-Acetylcysteine
- Additional laboratory studies and imaging
- Consults: e.g., anesthetist, critical care, nephrology, neurology.
- Serial ECGs and continuous cardiac monitoring: e.g., for patients with rhythm disturbances, cardiotoxic substances, multiple substances, unknown substances
- Monitor serial drug levels if relevant to the substance ingested.
- Determine the duration of observation according to patient risk.
- Consider admission for:
  - Symptomatic patients.
  - Asymptomatic patients expected to experience delayed toxicity
- Consider ICU admission for patients with:
  - Need for advanced airway management OR high risk of airway compromise
  - Need for mechanical ventilationOR high risk of respiratory failure
  - Need for vasoactive medications OR high risk of hemodynamic

instability
    - High risk of life-threatening complications: e.g., cardiac arrhythmias, seizures, cerebral edema, multiorgan failure
    - Need for hemodialysis
- Consider reassurance and discharge with instructions for patients with unintentional nontoxic exposures

II- Cannabis detoxification Guidelines

CLINICAL MANIFESTATIONS

●Tachycardia
●Increased blood pressure or, especially in older adults, orthostatic hypotension
●Increased respiratory rate
●Conjunctival injection (red eye)
●Dry mouth
●Increased appetite
●Nystagmus
●Ataxia
●Slurred speech
●Slowness (slows reaction time)

Complications associated with inhalation use include:
●Acute exacerbations and poor symptom control in patients with asthma.
●Pneumomediastinum and pneumothorax suggested by tachypnea, chest pain, and subcutaneous emphysemas caused by deep inhalation with breath-holding.
●Rarely, angina, myocardial infarction, and cardiac dysrhythmias.
The risk for myocardial infarction among regular cannabis users has been found to be significantly elevated over baseline risk in nonusers.

Cannabis intoxication also results in the following neuropsychiatric effects:
●**Mood, perception, thought content** – Ingestion typically leads to feeling "high," marked by a euphoric, pleasurable feeling and a decrease in anxiety, alertness, depression, and tension. However, first-time cannabis users, as well as anxious or psychologically vulnerable individuals, may experience anxiety, dysphoria, and panic. Increased sociability usually occurs during intoxication, although dysphoric reactions may be accompanied by social withdrawal. Inexperienced users who ingest cannabis products may not be aware that effects may not be felt for up to three hours, which may cause them to continue to consume high-potency products with an increased likelihood of dysphoria.
Perceptual changes include the sensation that colors are brighter and music is more vivid. Time perception is distorted in that perceived time is faster than clock time. Spatial perception can also be distorted, and high doses of potent cannabis products may cause hallucinations. Mystical

thinking, increased self-consciousness, and depersonalization may occur, as well as transient grandiosity, paranoia, pseudo philosophical way of thinking and other signs of psychosis. Acute intoxication from THC can also lead to acute psychotic symptoms, which are worsened with higher doses of THC.

●**Cognition, psychomotor performance** – Cannabis use slows reaction time and impairs attention, concentration, short-term memory, and risk assessment. These effects are additive when cannabis is used in conjunction with other central nervous system depressants. Acute cannabis use also impairs motor coordination and interferes with the ability to complete complex tasks that require divided attention.
Impairment of cognition, coordination, and judgment lasts much longer than the subjective mood change of feeling "high." Psychomotor impairment lasts for 12 to 24 hours due to accumulation of cannabis in adipose tissue, slow release of THC from fatty tissue stores, and enterohepatic recirculation. However, a cannabis user may think that he or she is no longer impaired several hours after the acute mood-altering effects have resolved. As an example, a placebo-controlled trial with licensed pilots found that smoking cannabis impaired performance on a flight simulator for up to 24 hours, although only one of the nine subjects recognized this impairment.
Acute psychomotor impairments interfere with the ability to operate other heavy machinery, such as automobiles, trains, and motorcycles. A meta-analysis of nine studies found an association between cannabis intoxication and an increased risk of a motor vehicle collision involving serious injury or death. Drivers using cannabis are two to seven times more likely to be responsible for accidents compared with drivers not using any drugs or alcohol. Furthermore, the probability of causing an accident increases with plasma levels of THC.

III- Synthetic cannabinoids detoxification Guidelines

Adverse effects of intoxication have been reported to occur even in those who only used SCs once, whereas withdrawal from SCs has been reported to occur in daily users and the urban commission for substance use said that withdrawal has been reported to occur in two or three times a week users. Symptom management for acute intoxication is frequently treated with supportive care, monitoring kidney function and intravenous fluids to treat electrolyte and fluid disturbances. Many adverse effects associated with acute intoxication are identical to some withdrawal symptoms; consequently, they are treated similarly. Patients who present with irritability, agitation, anxiety, and seizures associated with intoxication or withdrawal are generally administered benzodiazepines as a first-line treatment. Neuroleptics are also administered for acute psychosis and agitation and mania with psychotic symptoms. Although not always effective, antiemetics have been administered for hyperemesis. Table 1 highlights pharmacotherapies that have been implemented specifically for detoxification according to symptom. Quetiapine was effective in treating withdrawal symptoms in patients who failed to respond to benzodiazepines. Naltrexone has been prescribed to one patient and appeared to reduce SC cravings associated with detoxification. some patients are polysubstance users and have co-occurring psychiatric disorders. As such, symptoms that appear to be related to SC withdrawal may in fact be due to underlying issues exacerbated by SC use and not necessarily a direct reflection of SC withdrawal. Nonetheless, withdrawal does occur in otherwise healthy patients. In fact, in one report, the three patients requiring the highest doses of quetiapine to alleviate withdrawal symptoms were otherwise healthy individuals with no psychiatric history. These patients were also heavy SC users suggesting, again, that magnitude of withdrawal may correspond to quantity of use.
Pharmacotherapies for SC withdrawal

Withdrawal symptoms	**Treatment**
Agitation Irritability Anxiety Mood swings Nausea and vomiting	Haloperidol IM (5-10 mg, twice a day) Diazepam (5–25 mg, daily) Quetiapine (25–400 mg, daily)

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Withdrawal symptoms	**Treatment**
Loss of appetite	
Recurring seizures	Lorazepam Fosphenytoin (15 mg/kg)
Anxiety, seizure prophylaxis	Phenobarbital (100 mg, TID, tapered to 60 mg, TID, discontinued at discharge)
Anxiety and depression	Escitalopram (10 mg, increased to 20 mg at discharge)
General withdrawal symptoms	Clonidine (0.1 mg as needed)
Cramping	Tizanidine (8 mg as needed)
Nausea	Metoclopramide (10 mg as needed)
Appetite stimulation	Cyproheptadine (8 mg, QID)
Craving	Naltrexone initiated on day 3 (25 mg; dose increase to 50 mg on day 7)
Severe anxiety, sweat and chills, cravings,headaches, insomnia,vividdreams, weight loss, and sinus tachycardia	Lorazepam (2 mg, i.v.) Discharged with a short course of oral benzodiazepines
Chest pain, dyspnea, headache, diaphoresis, tremor anxiety, and sinus tachycardia	Low-dose benzodiazepines, hydroxyzine, and diphenhydramine (ineffective) Quetiapine (initial dose of 50 mg, with increase dose to maintain symptom relief; ineffective)
Internal unrest, craving, nightmares, profuse sweating, nausea, tremor, and headache	Zopiclone (3.25–7.5 mg for 3 days, then discontinued; ineffective) Promethazine (25 mg; ineffective) Clonidine (0.175 mg; ineffective)
Insomnia due to unrest and nervousness	Pramipexole (0.175 mg on day 11, increased to 0.35 mg on day 18; effective)

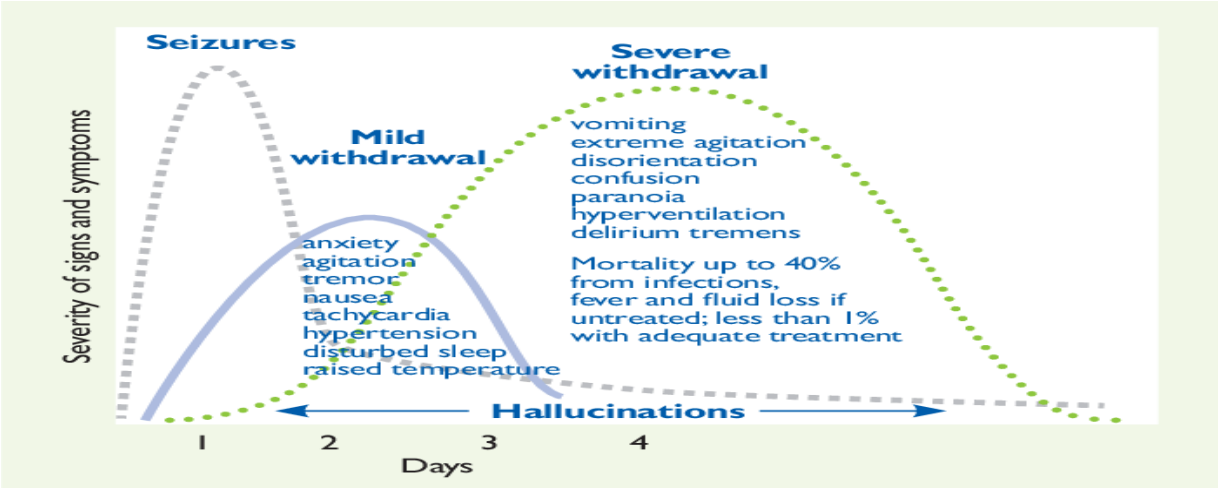
IV-Alcohol detoxification Guidelines

Inpatient Alcohol Detoxification

The following patients should offer inpatient admission:

- ✓ History of withdrawal fits.
- ✓ History of delirium tremens.
- ✓ Current illicit use of psychoactive drugs.
- ✓ Current psychiatric illness unless assessed.
- ✓ Current physical illness unless assessed.
- ✓ Blood test results predictive of a severe withdrawal syndrome. (Raised MCV, disorganized electrolyte levels, lowered haematocrit, and severely deranged liver function tests.)
- ✓ Those who have recently failed to complete an outpatient or home detoxification.
- ✓ Lack of appropriate home support (No reliable contact person to monitor the patient).
- ✓ No possibility for follow-up.
- ✓ Pregnancy

Alcohol withdrawal syndrome (**AWS**) is a set of symptoms that can occur following a reduction in alcohol use after a period of excessive use.



To be classified as alcohol withdrawal syndrome, patients must exhibit at least two of the following symptoms:

Increased hand tremor, insomnia, nausea or vomiting, transient hallucinations (auditory, visual or tactile), psychomotor agitation, anxiety, tonic–clonic seizures, and autonomic instability.

The severity of symptoms is detected by a number of factors:

1- Length of time the individual has been using alcohol.
2- Previous history of alcohol withdrawal.

Symptoms are also grouped together and classified:

- **Alcohol hallucinosis**: patients have transient visual, auditory, or tactile hallucinations, but are otherwise clear.
- **Withdrawal seizures**: seizures occur within 48 hours of alcohol cessations and occur either as a single generalized tonic-clonic seizure or as a brief episode of multiple seizures.
- **Delirium tremens**: hyper adrenergic state, disorientation, tremors, diaphoresis,impaired attention/consciousness, and visual and auditoryhallucinations.

-This usually occurs 24 to 72 hours after alcohol cessation.

Delirium tremens is the most severe form of withdrawal and occurs in 5 to 20% of patients experiencing detoxification and 1/3 of patients experiencing withdrawal seizures.Even the most severe of these symptoms can occur as soon as **2 hours after cessation**; this rapid onset alongside the syndrome's unpredictability necessitates either pre-planned hospitalization, treatment coordinated with a doctor, or at the very least rapid access to medical care.

In many cases, however, symptoms follow a reasonably predictable time frame as exampled below:

Six to 12 hours after the ingestion of the last drink, withdrawal symptoms such as shaking, headache, sweating, anxiety, nausea, or vomiting occur. Other comparable symptoms may also occur in this period. Twelve to 24 hours after cessation, the condition may progress to such major symptoms as confusion, hallucinations (with awareness of reality), tremor, agitation, and similar ailments.

At 24 to 48 hoursfollowing the last ethanol ingestion, the possibility of seizures should be anticipated.

Meanwhile, none of the earlier withdrawal symptoms will have abated. Seizures carry the risk of death for the person who consumes excess alcohol.Although the patient's condition usually begins to improve after 48 hours, withdrawal symptoms sometimes continue to increase in severity and advance to delirium tremens,

which is characterized by hallucinations that are indistinguishable from reality, severe confusion, seizures, high blood pressure, and fever that can persist anywhere from 4 to 12 days.

Protracted withdrawal

A protracted alcohol withdrawal syndrome occurs in many people with an alcohol use disorder when withdrawal symptoms continue beyond the acute withdrawal stage but usually at a sub-acute level of intensity and gradually decreasing with severity over time. This syndrome is sometimes

referred to as the post-acute-withdrawal syndrome. Some withdrawal symptoms can linger for at least **a year**afterdiscontinuation of alcohol. Symptoms can include a craving for alcohol, inability to feel pleasure from normally pleasurable things (known as anhedonia), clouding of sensorium, disorientation, nausea and vomiting or headache.

Insomnia is a common protracted withdrawal symptom that persists after the acute withdrawal phase of alcohol. Insomnia has also been found to influence relapse rate.

Treatment: Trazodone can help treat the persisting withdrawal symptom of insomnia in recovering people with alcohol use disorder. Insomnia can be difficult to treat in these individuals because many of the traditional sleep aids (e.g., benzodiazepine receptor agonists and barbiturate receptor agonists) work via a $GABA_A$ receptor mechanism and are cross-tolerant with alcohol.Protracted delirium tremens has been reported in the medical literature as a possible but unusual feature of alcohol withdrawal.

Diagnosis:**The clinical institute withdrawal assessment for alcohol** (CIWA) has also been shortened (now called the CIWA-Ar), while retaining its validity and reliability, to help assess patients more efficiently due to the life-threatening nature of alcohol withdrawal

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A standardized worksheet for assessing alcohol withdrawalsymptoms has been developed at the Addiction Research Foundation.

The worksheet, known as the Clinical Institute Withdrawal Assessment--Alcohol(CIWA-Ar)

NAUSEA AND VOMITING—As "Do you feel sick to your stomach? Have you vomited?" Observation.
0 no nausea and no vomiting
1 mild nausea with no vomiting
2
3
4 intermittent nausea with dry heaves
5
6
7 constant nausea, frequent dry heaves and vomiting

TREMOR—Arms extended and fingers spread apart. Observation.
0 no tremor
1 not visible, but can be felt fingertip to fingertip
2
3
4 moderate, with patient's arms extended
5
6
7 severe, even with arms not extended

PAROXYSMAL SWEATS—Observation.
0 no sweat visible
1 barely perceptible sweating, palms moist
2
3
4 beads of sweat obvious on forehead
5
6
7 drenching sweats

ANXIETY—Ask "Do you feel nervous?" Observation.
0 no anxiety, at ease
1 mildly anxious
2
3
4 moderately anxious, or guarded, so anxiety is inferred
5
6
7 equivalent to acute panic states as seen in severe delirium or acute schizophrenic reactions

AGITATION—Observation.
0 normal activity
1 somewhat more than normal activity
2
3
4 moderately fidgety and restless
5
6
7 paces back and forth during most of the interview, or constantly thrashes about

TACTILE DISTURBANCES—Ask "Have you any itching, pins and needles sensations, any burning, any numbness or do you feel bugs crawling on or under your skin?" Observation.
0 none
1 very mild itching, pins and needles, burning or numbness
2 mild itching, pins and needles, burning or numbness
3 moderate itching, pins and needles, burning or numbness
4 moderately severe hallucinations
5 severe hallucinations
6 extremely severe hallucinations
7 continuous hallucinations

AUDITORY DISTURBANCES—Ask "Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing to you? Are you hearing things you know are not there?" Observation.
0 not present
1 very mild harshness or ability to frighten
2 mild harshness or ability to frighten
3 moderate harshness or ability to frighten
4 moderately severe hallucinations
5 severe hallucinations
6 extremely severe hallucinations
7 continuous hallucinations

VISUAL DISTURBANCES—Ask "Does the light appear to be too bright? Is its colour different? Does it hurt your eyes? Are you seeing anything that is disturbing to you? Are you seeing things you know are not there?" Observation.
0 not present
1 very mild sensitivity
2 mild sensitivity
3 moderate sensitivity
4 moderately severe hallucinations
5 severe hallucinations
6 extremely severe hallucinations
7 continuous hallucinations

HEADACHE, FULLNESS IN HEAD—Ask "Does your head feel different? Does it feel like there is a band around your head?" Do not rate for dizziness or lightheadedness. Otherwise, rate severity.
0 not present
1 very mild
2 mild
3 moderate
4 moderately severe
5 severe
6 very severe
7 extremely severe

ORIENTATION AND CLOUDING OF SENSORIUM—Ask "What day is this? Where are you? Who am I?"
0 oriented and can do serial additions
1 cannot do serial additions or is uncertain about date
2 disoriented for date by no more than 2 calendar days
3 disoriented for date by more than 2 calendar days
4 disoriented for place and/or person

Total CIWA-A Score_____
Rater's Initials_____
Maximum Possible Score 67

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Clinical Institute Withdrawal Assessment of Alcohol Scale, Revised(CIWA-Ar) TheCIWA–Arcan measure10 symptoms.The assessment requires 2 minutes to perform. Scores of less than 8 to10 indicate minimal to mild withdrawal.¬ Scores of 8 to15 indicate moderate withdrawal (marked autonomic arousal).¬ Scoresof15 or more indicate severe withdrawal.¬ CIWA–Arcategories,withtherangeofscoresineachcategory,areasfollows: Agitation(0–7)¬ Anxiety(0–7)¬ Auditory Disturbances(0–7)¬ Clouding of Sensorium(0–4¬ Headache(0–7)¬ Nausea/Vomiting(0–7)¬ ParoxysmalSweats(0–7)¬ TactileDisturbances(0–7)¬ Tremor(0–7)¬ VisualDisturbances(0–7)¬ Total CIWA–ArScore_____ (Maximum possible score=67) Patients scoring less than10 do not usually need additional medication for withdrawal.

laboratory tests:

- Routine investigations (liver, kidney Functions, CBC)
- Review blood test results for FBC, urine and electrolytes, LFTs and gamma GT
- Diazepam tablets (5 mg) x 3 are prescribed, to be taken according to the chart below.
- Patient will complete the revised Clinical Institute withdrawal Assessment for Alcohol scale (CIWA-Ar) before diazepam or chlordiazepoxide is started, again 90 minutes later and once daily on subsequent days.

ALCOHOL DETOXIFICATION TIME TABLE

- Patients are assessed using the CIWA-Ar every 90 minutes, and given Diazepam (We need to consult the critical care doctors in doses & frequency for fear of respiratory depression) a day, dose to be gradually reduced over 5–7 days, for scores of eleven or above.
- Patients continue to be assessed twice more after their CIWA-Ar scores fall below 11 before the detoxification is considered Complete.

BenzodiazepinesThe most commonly used agents are long-acting benzodiazepines, such as chlordiazepoxide and diazepam. These are believed to be superior to other benzodiazepines for treatment of delirium and allow for longer periods between doses.However, benzodiazepines with intermediate half-lives like lorazepam may be safer in people with liver problems. Benzodiazepines showed a protective benefit against alcohol withdrawal symptoms, in particular seizure, compared to other

common methods of treatment. Although benzodiazepines are very effective at treating alcohol withdrawal, they should be carefully used. Benzodiazepines should only be used for brief periods in people with an alcohol use disorder who are not already dependent on them, as they share cross tolerance with alcohol. There is a risk of replacing an alcohol addiction with benzodiazepine dependence or adding another addiction.
Anexampleofadiazepamregimenforalcoholwithdrawalinan ambulatorysetting:
Days1diazepam10mgsixhourly¬
Day2–3diazepam5–10mgeighthourly¬
Day4diazepam5mgmorningandnight¬
Taperingdosesmayberequiredoverthenext2days.¬
Benzodiazepines withdrawal:
UseDiazepamindoseequivalenttoabusedtypeof¬ benzodiazepine.
Gradualreductionofdiazepamby5mgevery1–2days.¬
Othermedicationsthatcanbeusedtoassessbenzodiazepines¬ abuse:carbamazepine,buspirone,andpropranolol

Vitamins

Individuals who have an alcohol use disorder are often deficient in various nutrients, which can cause severe complications during alcohol withdrawal, such as the development of Wernicke syndrome. To help to prevent Wernicke syndrome, these individuals should be administered a multivitamin preparation with sufficient quantities of thiamine and folic acid. During alcohol withdrawal, the prophylactic administration of thiamine, folic acid, and pyridoxine intravenously is recommended before starting any carbohydrate-containing fluids or food.
All alcohol dependent patients undergoing detoxication should be prescribed oral thiamine 300mg daily and oral multivitamins 2 tabs daily.
All patients suspected to be suffering from the following:
• Peripheral neuropathy
• Wernicke’s encephalopathy (confessional state, ophthalmoplegia, nystagmus and ataxia).
Korsakoff’s psychosis
• Other alcohol related neurological condition should also be commenced on a full course of IM vitamins (Pabrinex), as per the manufacturer's instructions (two ampoules twice daily for five days or once daily for 10 days).

Procedure for use of vitamin b complex becombecozyme amp/8, melga

• Whenever possible give the injection when a doctor is present or available.

• After administration of the injection ask the patient to remain on the ward for 30 minutes.

Ask the patient to inform staff if they begin to feel unwell.

• Observe for signs of anaphylactic shock.

• If anaphylaxis is suspected carry out emergency procedure.

Anti-convulsants

Seizures in alcohol withdrawal are typically generalized, non-focal, occur singly and once only.

Seizures are most likely to occur 6 - 48 hours after reducing or stopping alcohol consumption, but may occur later.

Patients who have a history of generalized, tonic-clonic withdrawal seizures, should be treated with:

- modified release carbamazepine 200 mg bd. (reduce dose if side effects severe), or phenytoin 300 mg daily, for 14 days from the day of the detox and then gradually withdrawn.

This is in addition to the diazepam/chlordiazepoxide loading dose regime.

Naltrexone

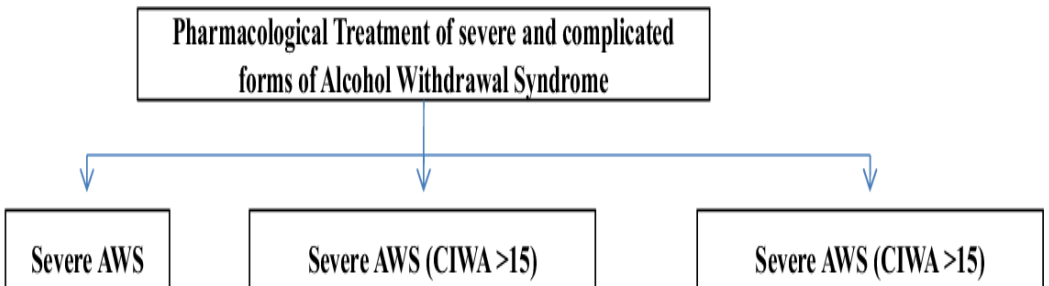
• Adjunct to prevent relapse in formerly alcohol-dependent patients as it is effective in reducing drinking frequency and relapse rate .

• Naltrexone should be started at a dose of 25 mg, increasing to 50 mg daily after 7 days. Staff or a family member should supervise this.

A consent form should be signed and a supervisor's letter given.

• Once a patient is stable the total weekly dose may be given in three doses per week under supervision (e.g. 50mg daily dose = 100mg on Monday, 100mg Wednesday and 150mg on Friday).

•Monitor LFTs monthly for the first three months of treatment



V-Sedative – hypnotics

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Sedative hypnotics are central nervous system **depressants** that act on the GABA-A receptor system, the main inhibitory system in the brain.

Sedative hypnotics include:

- Benzodiazepines- Zolpidem, zopiclone and zaleplon (‘Z’ drugs)
- Barbiturates.

Self-medication with benzodiazepines is also common, particularly by people who are alcohol or opioid dependent.Most use of benzodiazepines is short term or confined to use to induce sleep

Approximately 30% of people who start taking benzodiazepine develop dependence. Two-thirds of benzodiazepine dependent patients are women.

Side effects of benzodiazepines:

- Drowsiness, dizziness- Tiredness- Dysarthria
- Ataxia, risk of falls (particularly the elderly)
- Impaired psychomotor performance and reaction time (increased risk of accidents)
- Anterograde amnesia (occurs after taking the drug)
- Emotional blunting - Poor memory and concentration
- Rarely, paradoxical excitement and disinhibition (particularly in children and the elderly)

Patients at increased risk of benzodiazepine abuse/ dependence

- Insomniacs (particularly the elderly)
- Patients with chronic pain (prescribed benzodiazepines for muscle relaxation, insomnia, anxiety)
- Patients with:
- Alcohol dependence. - Psychostimulant abuse/dependence.
- Opioid dependence for alleviation of withdrawal symptoms.
- Psychiatric illnesses. - Generalized anxiety disorders - Panic attacks
- Agoraphobia - Psychotic states - Depression
- Anti-social personality disorders

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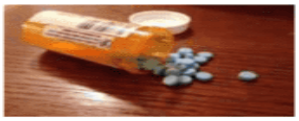

Benzodiazepines

Type of Drug
- Anxiolytic
- Works on the CNS by acting selectively on gamma-aminobutyric acid-A (GABA-A) receptors in the brain by making the neuron negatively charged and resistant to excitation
- They are used as sedatives, hypnotics, anxiolytics, anticonvulsants, and muscle relaxants
- Examples: Xanax, Ativan, Klonopin, Valium. Versed

Where It Comes From
- Introduced around 1960 with the marketing of chlordiazepoxide (Librium) and followed by its derivative diazepam (Valium)
- Replaced older more unsafe sedatives like barbiturates
- It is a chemical compound made in laboratories of pharmaceutical companies

Intoxication Effects
- Acute toxicity of benzodiazepines are extremely low, even in large doses
- Acute toxicity symptoms: confusion, dizziness, poor judgment and decision making, lack of coordination, slurred speech, difficulty breathing, weakness,
- Chronic toxicity will change a person's appearance and behavior which affects their relationships and work performance
- Chronic abuse symptoms: anxiety, insomnia, anorexia, tremors, headaches, weakness, and memory problems

Overdose Effects
- Symptoms of overdose – dizziness, confusion, drowsiness, blurred vision, unresponsiveness, anxiety, and agitation
- Physical exam findings for overdose - nystagmus, hallucinations, slurred speech, ataxia, hypotonia, weakness, altered mental status, amnesia, respiratory depression, paradoxical agitation, hypotension, coma

Treatment of Overdose
- Antidote is flumazenil (Romazicon) – specific for benzodiazepine poisoning and acute overdose; controversial because the risk usually out weight the possible benefits
- The best treatment for benzodiazepine overdose is good supportive care and monitoring of patient
- Very rarely fatal for benzodiazepine overdose but biggest concern is aspiration with altered mental status

Withdrawal
- May begin 12-24 hours after the last dose received, reaches peak intensity between 24 and 72 hours
- Signs and symptoms: Autonomic hyperactivity (sweating, HR >100), hand tremors, N/V, illusions, hallucinations, anxiety, grand mal seizures, fear, rapid mood changes, insomnia, hand tremors, and constipation
- Hospitalization is usually not required unless rare, but severe symptoms such as seizures occur
- Medications are usually not used for the withdrawal from benzodiazepines.
- Slowly lowering the doses of the substance is best to decrease the amount and severity of symptoms.

Benzodiazepine dependence

Dependence on benzodiazepines may occur after regular, daily use for more than 4–6 weeks, even at therapeutic doses.

Benzodiazepine overdose/intoxication:

- Drowsiness, confusion
- Dysarthria, ataxia
- Impaired co-ordination and concentration (increased risk of accidents)
- Coma
- Respiratory depression (use with care in-patients whose respiratory system is compromised)
- Death (particularly if used in combination with other CNS depressants such as alcohol, opioids).

The benzodiazepine withdrawal syndrome

Benzodiazepine withdrawal may cause seizures which are serious and life threatening.

Complications of benzodiazepine use

Physical complications of benzodiazepine use

Overdose/intoxication (accidental or suicidal)

- Accidents, injuries.
- Benzodiazepine dependence and withdrawal.
- Complications of injecting oral preparations.

Neuropsychiatric complications of benzodiazepine use

Memory impairment/anterograde amnesia: Impairment of ability to learn new information. The amnesic effect of high dose benzodiazepines is more commonly an undesired side effect of misuse.

Individuals using high doses may commit crimes, while disinhibited, e.g., assault or shoplifting, then not remember this the next day.

Anxiety: During benzodiazepine withdrawal, a number of symptoms that resemble an anxiety disorder, can occur including social phobia, generalized anxiety disorder, obsessive-compulsive disorder, and panic disorder.

Depression.

Paradoxical disinhibition.

Psychosis.

Delirium: May occur during: Benzodiazepine withdrawal or overdose.

Management of benzodiazepine overdose/intoxication

Overdose can be more dangerous when benzodiazepines are used in combination with other CNS depressants (e.g., alcohol, opioids).

Patient education and information

- Fully inform the patient about the potential side effects of benzodiazepines

- Falls (particularly in the elderly).
- Danger of driving or operating machinery because of risk of accidents, injuries.
- Warn of the risks associated with concurrent use of alcohol, opioids and other CNS depressants.
- Pregnant women should avoid chronic use of benzodiazepines because of the risk of the neonatal withdrawal syndrome.
- Patients should be advised not to take benzodiazepines on a regular basis for more than a few weeks because of the risk of dependence

- Benzodiazepine dependent patients should not suddenly stop their medication, or reduce their doses too quickly.
- Inform the patient fully about the signs and symptoms of benzodiazepine withdrawal.

'Z' drugs

Zolpidem and zopiclone both have hypnotic properties similar to those of the benzodiazepines, but better (shorter) kinetics, so less likely to cause hangover.

It was initially believed they would have low addictive potential, but lately a significant number of cases of abuse or dependence.

Gradual Benzodiazepines is recommended.

Personal team

- Initial assessment in the emergency Room or in the inpatient department done by **the specialist**.
- Referral or Admission done **by the specialist**.
- Plan of management and investigation in The AICU **by the specialist**
- Daily rotation and the follow up medically and psychological guided by objective methods by **the junior doctor**
- Daily close up observation and vital data, seizures monitoring by the **Nurses**.

IV- Opioid detoxification guidelines

All patients who have reduced or ceased opioid intake during a detoxification MUST be warned that their tolerance to opioids is likely to have reduced and that they are at increased risk of accidental opioid (and poly drug use) overdose. There should be buffers or a favorable assessment that the patient can overcome the period of lowered tolerance without putting themselves at excess risk.

Risk Management:

1- Poly substance dependence.
2- Heroin injectors.
3- Medical co morbidities e.g. subacute bacterial endocarditis in heroin injectors, seizures in Tramadol use disorders ..etc.
4- Dual diagnosis: Adult ADHD, social anxiety, personality disorder…etc.

First aid in the case of (overdose of OST)

- **The most significant risk of methadone and other opioid agonists is overdose, which can be fatal. Research evidence indicates that the highest risk of overdose at the start of methadone opioid substitution treatment. Less so in the case of buprenorphine treatment.**
- The induction period for OST and the early part of treatment are both associated with a high risk of overdose, as tolerance can be difficult to assess.
- Similarly, the period after leaving treatment, either after detoxification or with the sudden cessation of treatment, are associated with an increased risk of death.
- The risk of overdose is especially high following release from prison if tolerance has been reduced, they have a history of intravenous drug use, and/or a long history of opioid dependence or polydrug use.
- **Therefore, low doses are recommended at the beginning of treatment. However, once a stable dose is achieved (about two weeks) the risk of overdose death is then substantially reduced in comparison with the risk prior to treatment.**

Those who are out of treatment are approximately three times more likely to die than those who are stable in treatment (Farrell and Barry, 2010).

The patient has a high risk for methadone toxicity in the following circumstances.

- This is the patient's first presentation as a drug user, and their medical history and history of drug use are unclear.
- The patient has a high risk of poly-drug abuse and dependence.
- The degree of neuro-adaptation is unclear.
- The patient has a risk of overdosing on methadone or any other drug.
- The patient has a clinically significant respiratory disease.
- The patient has a clinically significant liver disease.
- The patient uses drugs that inhibit CYP3A4 enzyme.

Diagnosis of Acute opioid intoxication

- Acute opioid intoxication is diagnosed on the basis of several symptoms.
- An overdose is characterised by sudden CNS depression, which causes coma, bradypnoea (slow deep breathing, 2-4 times per minute), cyanosis, pulmonary oedema, hypoxia, bradycardia, hypothermia, nausea, vomiting, myosis (narrowed pupils).
- Acute opioid intoxication has to be treated if the respiration rate of the patient is lower than 10 times per minute.
- Patients should be warned about this at the start of opioid substitution treatment.

Signs and symptoms of methadone overdose	
Pinpoint pupils	Nausea
Dizziness	Feeling intoxicated
Sedation/nodding off	Unsteady gait, slurred speech
Snoring	Hypotension
Slow pulse (bradycardia)	Shallow breathing (hypoventilation)
Frothing at the mouth (pulmonary oedema)	Coma

Naloxone

- Naloxone is an effective antidote in the dose of 0.4 mg/ml; it is a competing antagonist to opioid receptors.
- **The main treatment plan includes a single 0.4–2mg injection into a vein or muscle as soon as possible.**
- This may be repeated until the patients regains consciousness or starts breathing.

- When injected intravenously, the medication will take effect after 1–2 minutes and the effect will last for 5–10 minutes. When injected intramuscularly, the medication will take effect after 5–10 minutes.
- Further monitoring of the patient is recommended as the effects of naloxone are shorter than those on fentanyl, heroin or methadone.
- **All service providers of opioid substitution treatment of opioid dependence must have naloxone on site including intra nasal naloxone spray for use in both non – medical and health care settings when it will be available**.
- The naloxone dose administered for methadone overdose is not sufficient in the case of buprenorphine overdose. Buprenorphine overdose should be treated with a naloxone dose of 10–30 mg/70kg.

- Naloxone should be available to people who use drugs, their peers and relatives, all kind of drug addiction treatment and harm reduction programs, prisons and professional staff not only in injecting form but in intranasal spray form, as well.

- For supporting abstinence from opioids naltrexone tablets and when available injection/implants off naltrexone should be used.

Reducing drug-related deaths

- Be aware of those most at risk.
- Provide easy and timely access to treatment.
- Retain people in treatment.
- Provide education and training to drug misusers and their families, on the risks of overdose and how to respond effectively.
- Advise on the dangers of combining drugs, especially alcohol and benzodiazepines.
- Educate new patients on the risks of loss of tolerance.
- Use appropriate supervised consumption in the early stages of OST.
- Confirm satisfactory home storage arrangement and document this, especially when children are in the home.
- Conduct or arrange a mental health assessment for anyone with a suicidal risk.
- Liaise effectively with the prison regarding transfer of care.
- Have an emergency protocol in place that covers the management of drug overdoses
- Overdose deaths often happen while people are asleep at home.

- The risk of death caused by overdose is decreased when OST medication is administered in the morning, so that there are more people close by who can call help should anything happen during the day. The patient's family should be warned that very deep snoring sounds at the start of opioid substitution treatment and ever can indicate dangerous respiratory arrest and that their doctor ought to be notified of this the next day.

-**Usually start with the symptomatic treatment until the patient condition stabilizes then deal with the co morbidity after one month of stabilization**. However, in case of medical co morbidity, must be dealt with hand in hand with the symptomatic treatment.
Treatment with Agitation and aggression in the beginning in case of comorbidities.
Drug induced psychosis:
-Haloperidol 5mg IM injection: accompanied by anti-cholinergic.
-Midazolam (Dormicum) 5-10mg IM injection if needed.
Avoid long-acting benzodiazepines in delirious sates.
Symptomatic treatment:
Causes of opiate withdrawal symptoms are
1-Noradrenaline surge related symptoms:
a) Runny eyes and nose, sweating.
b) Diarrhoea, abdominal cramps, feeling of hotness and coldness, goose pump skin and sleeping problems.
2-Dopamine deficiency: dysphoria, agitation, muscle and joint pain, malaise and craving.

Onset of the opiate withdrawal symptoms starts with 8 -24 hours from the last opiate dose.
Any patient withdrawing from opioids may gain symptomatic relief for 7-10 days, with one of each of the following groups of non-opioid drugs:Specific alpha 2 agonist Lefoxidine or possible clonidine, however clonidine may carry a risk of rebound hypertension.
Abdominal cramps:
Buscopan (hyoscine butylbromide) 20mg qds;
Spasmonal (alverine citrate) 60-120mg tds.
Diarrhoea: Loperamide 4 mg initially then 2mg after each loose stool
Muscle and joint pain:
Ibuprofen 400-600mg tds;

Arthrotec (diclofenac 50mg and misoprostol 200 micrograms) 1 tds;
Anxiety and agitation:
Diazepam 5mg qds;
Chlordiazepoxide 10mg qds
Insomnia:
Zopiclone 7.5mg 1-2 tablets bedtime.
For in-patients these should be prescribed in the "as required" section in accordance with current BNF and data sheet advice. (N.B. No two drugs from the same group should be prescribed simultaneously.)

Lofexidine Detoxification

- Lofexidine is fully licensed in the management of the symptoms of opiate withdrawal and for this purpose has been shown to be as efficactive as methadone and buprenorphine. [5] . However, the main obstacle is that Lofexidine is not available in the market regularly.
- Lofexidine is usually introduced when a person is to be detoxified without the aid of opioids. Lofexidine can be introduced into a opiate detoxification schedule at a of 40 mg/day methadone mixture.

Prior to commencing treatment:
1) baseline measurements for sitting and standing blood pressure should be recorded. The systolic blood pressure should not be below 90 mmHg before prescription of the first dose of lofexidine.
2)Women should be postmenopausal or undergo a pregnancy test to confirm a negative result before starting lofexidine.
3)Do not co-prescribe other drugs with alpha-adrenergic receptor blocking activity. These include tricyclic antidepressants and some neuroleptics.

- **Lofexidine is written up as**: 200 micrograms TDS daily, increasing in daily steps of 400 micrograms to a maximum of 2.4 mg (12 tablets) in divided doses (4 times daily). Patients' ability to tolerate lofexidine should be monitored and the dose adjusted accordingly if necessary. If the patient is abstinent from opioids when the regime starts, then treatment need last no longer than 7-10 days. The dose should be tailed off gradually, by 400-800 micrograms per day over three to four days.
- Pulse and Blood Pressure should be monitored twice weekly (minimum) as an outpatient.
- All patients should be given a lofexidine information sheet.

Lofexidine Schedule.

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Lofexidine (mgs) Morning	lunch	tea	night
	0.2		0.2
0.2	0.2	0.2	0.2
0.2	0.4	0.2	0.4
0.4	0.4	0.4	0.4
0.4	0.6	0.4	0.6
0.6	0.6	0.6	0.6
0.6	0.6	0.6	0.6
0.6	0.6	0.6	0.6
0.4	0.4	0.4	0.4
0.2	0.2	0.2	0.2
	0.2		0.2

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Naltrexone for Opiate Post detox

After completing an opiate detox satisfactorily, Naltrexone can be prescribed for abstinence maintenance.
Naltrexone's pharmacological action blocks opiate receptors for up to 72 hours blocking the euphoric effects of opiates.
Naltrexone (Nalorex) comes in 50 mg tablets taken orally
Patients need to be aware that an attempt to overcome the block could result in acute opiate intoxication and possible death, therefore a leaflet containing information and facts related to Naltrexone treatment will be given, and at the same time a specific contract for Naltrexone will be signed by the patient.
Naltrexone is considered to be effective and is utilised in the prevention of relapse in opiates dependant clients.

If naltrexone is to be started:

7-10 days after the last dose of buprenorphine has been taken, the doctor can undertake a naloxone challenge on the next day, administering 1.2mg of naloxone IM to the patient.
If this challenge proves negative (SOWS score less than 5) then instruct the client to crush a ¼ of a 50mg naltrexone tablet and take small quantities of it through the day. If withdrawal symptoms are experienced during the day on this small quantity the patient should stop the naltrexone and be re-challenged the next day. If no withdrawal symptoms are noted through the day, then on the next day ¼ of a naltrexone tablet can be swallowed whole in the morning. On subsequent days, for one week the oral dose should be increased to 25mg, before further increasing the daily dose to 50mg.
If the patient scores 5 or higher on the SOWS during the naloxone challenge instruct the patient to avoid opioids and re-challenge the next day.
On each visit check pulse, blood pressure and administer the Short Opiate Withdrawal Scale (SOWS).

Administration

1) All patients will have a blood sample taken for LFT and results should be obtained before starting Naltrexone.
2) Any clinical sign or symptom related with acute hepatitis or liver failure will exclude the patient of any Naltrexone prescription until complete evaluation including blood tests is performed.
3) All patients on Naltrexone should carry a Naltrexone alert card.

4) There should be 7-10 days period between last recorded opiate consumption and starting Naltrexone, or 7-10 days following Buprenorphine detox.
5) Following one negative opiate urine/ oral fluid drug screen, the patient can be commenced on an initial dose of 12.5 - 25mg daily (1/4 - 1/2 a tablet), increasing to 50mg daily after 7 days.
6) The patient will then be prescribed 50mg Naltrexone daily for at least 6-12 months, providing they comply with their treatment contract.
7) The first dose of Naltrexone will be given under supervision.

Naltrexone will be administered as part of a carefully agreed treatment plan between treatment team and patient.

Patients undergoing Naltrexone treatment will continue to receive monitoring plus evaluator follow up from the medical team, for the duration of their treatment.

For the most effective use of Naltrexone therapy in relapse prevention, it is considered that Naltrexone should be administered to patients under supervision.

Providing of naloxone injection and instructions on its use to opiate prescribed patients. We will also provide training for clients and family members in how to use Naloxone in case of an opiate overdose.

Maintaining Abstinence with Naltrexone (Anarcol)

- Naltrexone is a pure opioid antagonist licensed for relapse prevention of detoxified former opioid patients
- Naltrexone should be offered to all patients who have successfully achieved abstinence from opioid drugs.
- Recent liver and renal function test results should be available to the prescriber, prior to starting naltrexone (naltrexone can be started in patients with mild elevations in liver function tests: up to threefold increases in transaminase levels).
- Women should be postmenopausal or undergo a pregnancy test to confirm a negative result before receiving naltrexone.
- Give the patient a naltrexone information leaflet and card.
- Give information letter to supervisor.
- Before commencing naltrexone ensure that the patient has signed a consent form declaring that they have ceased all opiate use for a safe period (7 days clear for methadone, 3 days for other opiates). Before giving naltrexone check a urine sample for opiates with an on-site test.

- Naltrexone is then continued, at a dose of 25 mg daily, increasing to 50 mg daily after 7 days. Consumption should be supervised.
- Once a patient is stable the total weekly dose may be given in three doses per week under supervision (e.g. 50mg daily dose = 100mg on Monday, 100mg Wednesday and 150mg on Friday).
- Monitor LFTs monthly for the first three months of treatment.

WARNING: Ensure that the patient understands that trying to overcome the opiate blockade is extremely dangerous and potentially fatal. Patients should take precautions against the effects of lowered tolerance should they stop taking Naltrexone.

APPENDIX II

OPIOID EQUIVALENCES

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DRUG	AMOUNT	METHADONE EQUIVALENT
Buprenorphine (Temgesic)	0.2 mg tab 0.3 mg amp	2.5 mg 4 mg
Codeine linctus 100mls Codeine phosphate (Actifed-compound100mg)	300 mg 15 mg tab 200 mg	10 mg 1 mg 6 mg
Dextromoramide (Palfium)	5 mg tab	5-10 mg
Dihydrocodeine (DF118)	30 mg	0-5 mg
Dipipanone (Diconal)	10 mg tab	0-5 mg
Heroin (street)	 1/4 gram 1/2 gram 1 gram NB reduce by 1/3 if smoked rather than intravenous.	 10-20 mg 20-40 mg 40-60 mg
Heroin(pharmaceutical) (Diamorphine)	10 mg tab 10 mg freeze-dried amp. 30 mg freeze-dried amp	10 mg 10 mg 25 mg
Morphine(Gee's linctus 100 ml) (MST)	10 mg amp 16 mg (anhydrous) Start on 50 % of mg dose	10 mg 10 mg
Opium (Dr Collis Brown 100 ml)	1.4%	10 mg
Pentazocine (Fortral)	50 mg cap 25 mg tab	4 mg 2 mg
Pethidine	25/50 mg tab 50 mg amp	3-5 mg 5 mg

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SHORT OPIATE WITHDRAWAL SCALE (Gossop, 1990)

NAME: _____ DOB: _____ CASE No:

STARTING DATE: ___ / ___ / ___

Severe = 3 Moderate = 2 Mild = 1 Nil = 0

DAY										
Feeling sick										
Stomach cramps										
Muscle spasms										
Feeling cold/gooseflesh										
Sweating										
Heart pounding										
Muscular tension										
Aches and pains										
Weakness										
Yawning										
Runny eyes										
Difficulty sleeping										

TOTAL SCORE										

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Patient Information – LOFEXIDINE (Britoflex®)

WHAT IS LOFEXIDINE?

Lofexidine is a prescribed medication that reduces symptoms associated with opiate withdrawal such as chills, sweating, stomach cramps, diarrhoea, muscle pain, runny nose and eyes. Lofexidine does not reduce all withdrawal signs.

HOW DOES LOFEXIDINE WORK?

When opioid drugs are reduced or ceased suddenly the brain is thrown into an excitable state. This happens because the sudden reduction of opiate causes the brain to produce too much of the chemical neurotransmitter noradrenaline. Too much noradrenaline in the brain causes many of the withdrawal symptoms experienced in opiate withdrawal. Lofexidine works by cutting down the level of noradrenaline activity in the brain and so cuts down the severity of withdrawal.

IS LOFEXIDINE AN OPIATE?

No, lofexidine is not an opiate and is not addictive.

THE COURSE OF LOFEXIDINE TREATMENT.

1. Lofexidine may be used when you first come off opiates or after a period of stabilisation and reduction of opiate use.
2. Lofexidine should be prescribed in gradually increasing doses to a maximum of 12 tablets a day. The daily dose should be dependent on your signs of opiate withdrawal and experience of side effects from lofexidine.
3. Lofexidine treatment usually lasts for 7-14 days.
4. The lofexidine dose is gradually decreased in the last few days of the course. This is because suddenly stopping lofexidine may cause a rapid rise in blood pressure.

COMMON SIDE EFFECTS, REMEDIES AND PRECAUTIONS.

1. Dry mouth, nose and throat - Try to drink plenty of fluid. This may help with the dry mouth.
2. Drowsiness - Do not drive or operate machinery.
3. Lowered blood pressure or lowered pulse rate - This may result in dizziness, faintness, nausea or a headache. Your blood pressure and pulse should be checked during your treatment and your lofexidine prescription adjusted as required. If you experience these problems lie

down for half an hour and you should recover. Persistent problems mean that you should omit the next dose of lofexidine and discuss the problem with your keyworker.
4. Lofexidine is not established as safe during pregnancy. - Women of childbearing age should use contraceptive precautions during treatment with lofexidine.

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NALTREXONE INFORMATION LEAFLET FOR PATIENTS

What you should know before you start taking Naltrexone

Do not take Naltrexone if:

You are currently dependant on opiate drugs or going through withdrawal because a withdrawal syndrome or “cold turkey” may be precipitated or worsened.

You are currently taking a medicine which contains an opiate, for example certain cough medicines, antidiarrhoeals (such kaolin with morphine) and analgesics (pain killers). Note Naltrexone does not block the effect of analgesics, which do not contain an opiate (such as ibuprofen, paracetamol and aspirin).

You have acute hepatitis or liver failure.

You have ever been allergic to this medicine or to any of its ingredients.

If any of the above affect you , or you are not clear if they do, discuss this matter with your doctor or nurse who will be able to advise.

You must tell your doctor if:

You have liver or kidney disease.

You are taking any opioid containing medicine or other medicines. You should also tell your doctor about any medicines that you take that you buy without prescription.

If you feel tired or dizzy after taking this medicine do not drive or operate machinery until you have discussed this with your doctor or nurse.

After Taking Naltrexone

The following unwanted effects have been reported most frequently while taking Naltrexone:

Difficulty sleeping, anxiety, nervousness, abdominal cramps and pain, nausea and/or vomiting, lack of energy, joint and muscle pain, headaches, loss of appetite, diarrhoea, constipation, increased thirst, increased energy, feeling down or tired, irritability, dizziness, skin rash, delayed ejaculation, reduced libido, chills, chest pain, increased sweating and increased flow of tears.

One case of bruising/bleeding has also been reported.

It is important that you stop taking Naltrexone immediately and see your doctor as soon as possible if you develop abdominal pain lasting more than a few days, white bowel movements, dark urine or yellowing of your eyes.

A medical alert card will be included with this medicine. Always carry your medical alert card to ensure proper pain treatment in an emergency. Some

medicines may contain opiates (cough medicines, antidiarrheals and analgesics). Naltrexone may block the effects of these medicines. Do not attempt to overcome this blockade by taking large quantities of these medicines since that may be life threatening. If you are ill and require treatment you must tell all of your doctors or pharmacists that you are taking Naltrexone. They can then recommend a medicine, which will be effective.

VERY IMPORTANT

REMEMBER THAT ONCE YOU HAVE STARTED TAKING **NALTREXONE YOU HAVE LOST YOUR TOLERANCE TO OPIATES**, THEREFORE THE USUAL DOSE OF OPIATES YOU WERE TAKING PREVIOUSLY COULD BE LETHAL NOW.

YOU COULD DIEIF YOU TAKE THE SAME AMOUNT OF OPIOIDS BEFORE TREATMENT.

Name of patient:……Sign……Date / /

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NALTREXONE CONSENT FORM

1. I have received a Naltrexone information leaflet, read it and understand the implications of the treatment.
2. I agree to have a blood test to check my liver function.
3. I refuse to have a blood test to check my liver function, I am aware of the implications of this and still wish to start the treatment.

Signed…….

4. I have been given a medical alert card to carry at all times.
5. I have been given information regarding the increased risk of overdose and reduced tolerance to opiate medication / street drugs.
6. I agree to return to the CRL Centre at least once a month for review. I am aware that if I fail to attend, my treatment may be stopped.
7. **Female clients - I understand that I need to take precautions against pregnancy whilst taking naltrexone.**

PATIENT NAME: _____ **NB:** _____

SIGN: _____ **DATE:** _____

NURSE NAME: _____

SIGN: _____ **DATE:** _____

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NALTREXONE: SUPERVISOR'S LETTER (for opiates)

Dear Sir / Madam,

Your relative / friend has recently seen me because of problems related to his/her taking of opiate drugs.

He / She has agreed to take a drug called Naltrexone. I have explained the benefits and effects of the drug to him/her. The drug has been proven to be effective in stopping people from taking opiates when they want to stop but find it difficult.

I am writing to enlist your help by supervising your relative / friend as he/she takes their tablets. This is one of the most important aspects of the treatment. It is essential that they are taken regularly. If he/she says they have already taken Naltrexone watch him/her take the tablets again. Do not trust him/her to take the medication.

If you are willing to help, I would be grateful if you would follow these instructions:

Either:
Once each day watch him / her swallow their tablet.
Or:
On three days of the week (Monday, Wednesday and Friday) watch him / her swallow their tablets.

One problem that commonly happens is that after a few weeks the person doing the supervising is so pleased with progress that problems are forgotten, trust is restored and the Naltrexone is left unsupervised. This usually leads to immediate relapse and subsequently loss of faith in the Naltrexone and the drug taker.

Your relative / friend has an absolute right to refuse to take the drug when you offer it to him/her. If this is before the agreed timescale for him/her taking the drug it you can probably expect him/her to start taking opiates again at the earliest opportunity. It is unsafe for him/her to take opiate drugs whilst he/she is on Naltrexone when they first stop taking Naltrexone, and at any time.

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Your relative / friend has agreed to take Naltrexone for a period of 6 months in the first instance.

Should you be unclear about what to do, please do not hesitate to contact the CRL clinics.

Side effects are unusual. If you believe that the drug is causing side effects contact the CRL or your GP for advice.

Please accompany your relative / friend to his/her next clinic appointment if you wish.

Yours sincerely,

Staff member / key worker (contact tel. number)

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PATIENT INFORMATION
(Naltrexone Hydrochloride)

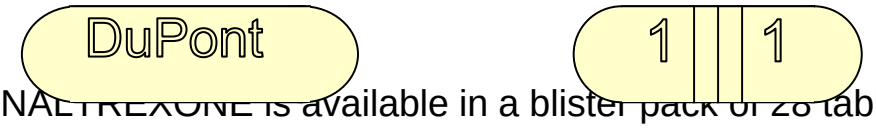
Please read this carefully before you start to take your medicine. This leaflet provides a summary of the information available on your medicine.
If you have any questions or are not sure about anything, ask your doctor or pharmacist.

What you should know about NALTREXONE

What is NALTREXONE?

NalTREXONE tablets are pale yellow, capsule-shaped tablets marked on one side with 'Du Pont' and on the other side with '11', containing naltrexone hydrochloride 50mg.

In addition NALTREXONE tablets contain the following inactive ingredients: Lactose Monohydrate NF / EP; Microcrystalline Cellulose NF /EP; Crospovidone NF /EP; Colloidal Silicon Dioxide NF /EP; Magnesium Stearate NF /EP; Pale Yellow Opadry YS-1-6378-G (hydroxypropyl cellulose, polyethylene gyycol, polysorbate 80 and colouring agents titanium dioxide, yellow and red iron oxide.



NALTREXONE is available in a blister pack of 28 tablets.

Naltrexone hydrochloride is an opioid antagonist, which means that it blocks the effects of opioid drugs (e.g. dihydrocodeine, morphine, methadone, subutex, heroin, etc.)

Why are you taking NALTREXONE?

NALTREXONE is used together with your other forms of treatment such as counselling to help you to remain free from your dependence on heroin, methadone and other similar opiate drugs of addiction.

What should you know before you start taking NALTREXONE?

Do not take NALTREXONE if:

- You are currently dependent on opiate drugs or going through a withdrawal because a withdrawal syndrome 'cold turkey' may be precipitated or worsened.
- You are currently taking a medicine which contains an opiate, for example certain cough medicines, antidiarrhoeals (such as kaolin with morphine) and analgesics (pain killers). Note: NALTREXONE does not

block the effect of analgesics which do not contain an opiate (such as ibuprofen, paracetamol and aspirin).

- You have acute hepatitis or liver failure.
- You have ever been allergic to this medicine or to any of its ingredients (see what is NALTREXONE section).
- If any of the above effect you, or you are not clear if they do, discuss this matter with your doctor who will be able to advise.

You must tell your doctor if:

- You have liver or kidney disease.
- You are pregnant, planning to become pregnant or are breast-feeding.
- You are taking any opioid containing medicine (see above) or other medicines. You should also tell your doctor about any medicines that you buy without a prescription.
- If you feel tired or dizzy after taking this medicine do not drive or operate machinery until you have discussed this with your doctor.

How to take NALTREXONE tablets:

You must have stopped taking any opiate for at least 7 – 10 days before starting NALTREXONE

Your doctor may carry out a test, which will show that you are free from these drugs before starting your treatment.

NALTREXONE tablets must be taken by mouth. Take NALTREXONE as directed by our doctor. You will usually be given a starting dose of half a tablet (25mg) increasing to one tablet (50mg) daily. This is the usual adult dose.

Doctors sometime prescribe a different dose to this: if this applies to you, you should discuss it with your doctor if you have not already done so.

V-Rapid Tranquilisation

Rapid tranquilisation is defined as the use of psychotropic medication to control agitated, threatening or destructive psychotic behavior. It should not be confused with rapid neuroleptisation that entails giving high loading dose of neuroleptics to achieve an early remission. The aim is to reduce patient suffering, allow improved communication, reduce risks to the patient and others, and to do no harm. It is used only when less coercive approaches such as diversion and verbal de- escalation have failed. Antipsychotics are often used in rapid tranquillisation, and can bring about rapid improvement in symptoms of psychosis and mania, to a greater extent than benzodiazepines.

Patients requiring rapid tranquilisation tend to fall into two groups: those who require repeated injections due to persistent refusal and resulting aggressive behavior and those who require only one or two injections early on in their treatment oral medication.

There is no national or international consensus on the most effective drug treatment. The drugs most frequently used are antipsychotics and benzodiazepines, separately or together. Whenever possible, rapid tranquillisation drugs should be given orally. It is sometimes necessary for these drugs to be administered by intramuscular injection while a patient is being restrained. Intravenous administration is the most hazardous route and should be limited to situations where immediate tranquillisation is deemed essential. Associated adverse effects include respiratory depression, hypotension, irregular or slow pulse, neuroleptic malignant syndrome and acute dystonia.

HALOPERIDOL ADMINISTRATION – ORAL andINTRAMUSCULAR EQUIVALENT DOSES

Intramuscular doses have a greater bioavailability than oral doses, therefore the maximum recommended daily dose
for each route of administration is different. **Use separate lines on the treatment sheet for each route of administration**

Maximum oral dose in 24 hours is 20mg
Maximum IM dose in 24 hours is 12mg
Any doses above these should be monitored according to
High Dose Antipsychotic guidance

If a patient has received both haloperidol IM and oral in the last 24 hours. Use the conversion chart below to calculate how much the patient has received in total:

	APPROXIMATE EQUIVALENT DOSES (mg)											
Oral Haloperidol	0.5	1	1.5	2.5	4.2	5	7.5	8.3	10	12.5	16.7	20
IM Haloperidol	0.3	0.6	0.9	1.5	2.5	3	4.5	5	6	7.5	10	12

For example:

Patient has been given 1 x 5mg haloperidol**IM**, followed 30 minutes later by 5mg **orally**, then 30 minutes later by another 5mg **orally**.

Convert to all **oral** doses, i.e. 8.3mg + 5mg + 5mg = 18.3mg **oral** equivalent

OR

Convert to all **IM** doses, i.e. 5mg + 3mg+ 3mg = 11mg **IM** equivalent

Therefore the patient may receive a further 10mg **oral** equivalent or 5mg **IM** equivalent haloperidol within the 24 hour period.

Note: Don't forget to adding Benztropine or Anti-histaminic or Both with haloperidol to avoid EPS symptoms.

Advice on the Preparation and Administration of Lorazepam (Ativan®) Intramuscular (IM) Injection

- **IM lorazepam must only be administered diluted1:1 with sodiumchloride0.9% or water for injection.**
- IM Lorazepam must not be mixed with any diluents other than sodium chloride 0.9% or water for injection.
- Lorazepam injection is only manufactured as one strength: 4mg in1ml.
- The following shows the volume required for doses of lorazepam injection 4mg in1ml:

Dose required		Vol.of lorazepam		Vol. of diluent
0.5mg	=	0.125ml	+	0.125ml
1mg	=	0.25ml	+	0.25ml
2mg	=	0.50ml	+	0.50ml
3mg	=	0.75ml	+	0.75ml
4mg	=	1.00ml	+	1.00ml

- Example: For a prescription of lorazepam 2mg IM

Draw up **0.5ml of lorazepam 4mg in 1ml** and**0.5ml of sodium chloride 0.9%** or**0.5ml water for injection**
Always remember to mix lorazepam 1:1 with diluent

- If lorazepam IM is prescribed as part of rapid tranquillization ALWAYS follow the Rapid Tranquillisation Policy, including patient monitoring parameters.

Lorazepam injection MUST be stored in the FRIDGE

Some of the above-mentioned medications are not used in Egypt

COMPLICATIONS OF RAPID TRANQUILLISATION AT USUAL DOSES

1. Local bruising pain or extravasation = up to 30% of patients.
2. Respiratory complications =2%
3. Cardiovascular complications = 3%. Quinidine like effects of phenothiazines contra-indicate these in patients with pre-existing dysrhythmia. Haloperidol is preferred but be aware of postural hypotension, bradycardia and QT prolongation.
4. Seizures particularly in non-compliant epileptics – avoidhigh dose Chlorpromazine.
5. Treat and evacuate patients with sustained convulsion (status epilepticus). PR or IV Diazepam may be required along with airway control.
6. Neuroleptic malignant syndrome – heat exhaustion and heat stroke can arise particularly in neuroleptically naïve patients. Close observation of temperature should be carried out and if suspected, arrange transfer to the General Hospital. CPK levels may be elevated due to intramuscular routes being used. This information should be passed to medical team.
7. Sudden (unexplained) death which, if it occurs, is often 2 to 3 minutes after intravenous injection. Most have toxic blood concentrations of neuroleptics. This is a particular hazard when patients have been unresponsive to intramuscular dosing and when BNF limits are exceeded.
8. Extra pyramidal symptoms, especially acute dystonia. This may affect 30% of patients in the first 24 hours and up to 50% of young males later on. It is painful and distressing and responds best to intravenous Procyclidine and Diazepam if required. It should prompt the review of future neuroleptic type and dose. It is particularly likely to occur when Haloperidol is used. Respiratory arrest can occur due to both dystonia and to excessive use of Diazepam. If untreated, hypoxic brain injury and cardiac arrest may follow. Appropriate resuscitation should begin and transfer to the General Hospital be arranged.

9. Aspiration of stomach contents may occur during prolonged restraint, tranquillisation or if consciousness is lost due to, for example, convulsion or withdrawal reaction and may lead to airway obstruction or respiratory distress, pneumonia or cardiac arrest due to vagal stimulation. Appropriate resuscitation should begin on the ward and the patient be transferred to the General Hospital.

10. Toxic megacolon, paralytic ileus and unstable blood sugar, thermo- regulation and anaphylactic reactions are rare but have been reported following rapid tranquillization and rarely intramuscular administration may lead to inadvertent venipuncture which may be rapidly fatal

RAPID TRANQUILLISATION –ASSESSMENT AND PROGRESS CHART					
Patient name			**ID #**		
Date			**Time**		
Before IM medication is administered, the following has been considered					
Physical examination		Recent U & E		Recent Drug Screen	
Recent ECG		History of EPSE		Past response to RT	
This review led to these investigations or actions (specify any deemed necessary)					

Time	**Actual date and time**	**Temp**	**BP**	**Pulse bpm**	**Resprn. Per min**	**pO^2**	**RASS score**	**Comments**	**Signature**
0 mins									
15 mins									
30 mins									
45 mins									
60 mins									
90 mins									
120 mins									

RAPID TRANQUILLISATION – ASSESSMENT AND PROGRESS CHART: GUIDANCE	
Temperature	If temperature increasing monitor closely for Neuroleptic Malignant Syndrome: 1. Fluctuating blood pressure 2. Muscular rigidity 3. Confusion 4. Altered consciousness If any of these feature present seek urgent medical advice.
Blood pressure	If Diastolic <50 mmHg: 1. Lie patient flat and raise legs 2. Monitor closely. 3. Seek medical advice.
Pulse (Beats / min)	If pulse slow (<50 bpm) or irregular: 1. Perform an ECG. 2. Withhold antipsychotics. 3. Monitor closely 4. Seek medical advice
Respirations (per min) pO^2	If respirations slowing: 2. Give oxygen. 3. Raise legs. 4. If necessary, ventilate mechanically. 5. Seek medical advice If respiratory rate drops below 10/minute or Oxygen Saturation <90% ring emergency services as per cardiopulmonary resuscitation procedures. If benzodiazepines have been administered consider administration of Flumazenil.
RASS	If < 0 6. Increase frequency of monitoring 7. If decreasing rapidly seek medical advice

RAPID TRANQUILLISATION EPISODE CRITERIA AND REVIEW PATHWAY

NAME ID # DOB **(OR AFFIX LABEL HERE)**	WARD/UNIT MHA STATUS ETHNICITY

Criteria of Need for RT episode:

The patient currently is suffering from: (ring all symptoms)

Severe Aggression Severe AgitationSevere Disinhibition Other(please specify)

……

Symptomatic improvement to be measured BY:

……..

There is an immediate risk to self or others (tick box)	
There is an immediate need for Rapid Tranquillisation	

The following criteria have been considered (□- considered, □- unavailable)

ECG		FBC		U&E	CPK		LFT	
BUN		Previous response			Previous tolerability			
Patient preference			Physical health conditions					

Medication regime prescribed by:	**Print**	**Sign**
Medication regime initiated by:	**Print**	**Sign**
	Date	**Time**

Reviews of need for RT

(Enter next due review and time after each review)

Planned review date /time	Actual review date /time	Medication review		Print	Sign
		Effective?	Tolerated?		

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