

Rapid Tranquilisation in the Emergency Department

Key Points

- This guideline applies to patients **over the age of 18 years**. For children and adolescents, see the [PIER guidelines](#).
- This guideline is not applicable to elderly delirium. Please see the respective “Managing Delirium in Older People 65 Years and Above” Guideline for further information.

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Abbreviations

ABD	Acute Behavioural Disturbance
BVM	Bag-Valve-Mask
etCO ₂	End-tidal carbon dioxide sampling
IM	Intramuscular
IV	Intravenous
NPIS	National Poisons Information Service
NRM	Non-Rebreather Mask
QT	Interval between the Q and T waves on an electrocardiogram (ECG)
RCEM	Royal College of Emergency Medicine
RT	Rapid Tranquilisation

Summary - Rapid Tranquillisation

Assessment and de-escalation
➤ Attempt de-escalation ➤ Capacity assessment and senior review ➤ Offer lorazepam 1-2 mg PO
Preparation
➤ Medications drawn up and checked ➤ Monitoring (pulse oximeter, cardiac monitor, NIBP, etCO_2), oxygen and NRM, airway trolley, BVM, and suction prepared ➤ Adequate number of staff present ➤ Safety brief performed (roles, plan including for IV access and relaxing restraint, anticipated problems)
First-line medications
Ketamine 4 mg/kg IM (using 50 mg/mL) OR Droperidol 10 mg IM Can repeat 5-10 mg after 15 min, max. 20 mg in 24 h
Second-line medications
Haloperidol 5 mg IM (+/- lorazepam 2-4 mg IM) Can repeat haloperidol after 30 min; max. 12 mg / 24 h OR Lorazepam 2-4 mg IM Can repeat after 60 min; max 4 mg / 24 h OR Midazolam 5-10 mg IM
<i>Haloperidol & droperidol are contraindicated in Parkinson's disease and Lewy body dementia. Adjust doses for patient's body habitus and other recent medications. Consider reducing doses by half for patients >65 years old.</i>
Post-effect
➤ Attach monitoring as appropriate (pulse oximeter, cardiac monitor, NIBP, etCO_2 if possible, in the context of the presentation) ➤ Monitor in the most clinically appropriate area ➤ Monitor closely, in regular short intervals, over the first 2 hours post sedation ➤ Establish and secure IV access ➤ ECG, further investigations and treatment as needed ➤ Document (collateral history, indication for RT, de-escalation attempts, mental capacity assessment, restraint, police/security involvement)

Definition

Rapid tranquilisation (RT) is a procedure in which parenteral sedative medications are used to manage patients with acute behavioural disturbance (ABD) to achieve one or more of the following:

- Minimize the risk of harm to patient or others
- Prevent further sympathetic over-stimulation and excessive muscular activity from causing a metabolic storm and subsequent cardiovascular collapse
- Facilitate further investigations and treatment in life-threatening situations

Rapid tranquilisation is more likely to be required in the following situations:

- Patients lacking capacity
- Patients presenting significant danger to themselves or others
- Patients requiring emergency treatment / investigation
- Patients that are severely agitated
- Patients that may have a life-threatening aetiology resulting in ABD

Acute Behavioural Disturbance

ABD is not a diagnosis or syndrome. It is a clinical picture with a variety of presenting features and potential causes, including one or more of the following:

- Agitation
- Constant physical activity
- Fear or panic
- Unusual or unexpected strength
- Sustained non-compliance with police or ambulance staff
- Increased pain tolerance
- Hot to touch and/or sweating
- Tachypnoea and/or tachycardia

Potential causes of ABD

The most common causes of ABD are intoxication, usually with illicit substances, or mental health conditions. However, life-threatening conditions such as hypoxia, hypoglycaemia, electrolyte abnormalities, sepsis, serotonin syndrome, seizures, substance withdrawal, head injury, heat stroke, anticholinergic syndrome, neuroleptic syndrome and thyroid storm may cause ABD as well.

Potential risks associated with rapid tranquilisation

Over-sedation, airway compromise, respiratory depression, dystonia, risk of neuroleptic malignant syndrome, cardiovascular compromise, hypotension, and arrhythmias are some of the risks associated with RT.

De-escalation

Verbal and environmental de-escalation can be a valuable tool in managing patients with behavioural disturbance. It may help avoid use of restraint and progression to RT. Offer oral medication, if appropriate, sooner rather than later. Maintain a safe, observable, low-stimulus environment with removal of possible harm, such as ligatures or moveable furniture. The principles are emphasised in the domains of de-escalation (Richmond, 2012).

Restraint

Use the least restrictive option necessary to remove any ongoing restraint *at the earliest opportunity*. Continued exertion under restraint may contribute to poor outcomes due to:

- Increasing catecholamine levels (adrenaline excess)
- Hyperthermia
- Severe metabolic acidosis
- Airway obstruction / asphyxiation

Parenteral medications

- The choice of medication will depend on the patient's clinical presentation and thus a balance of the need for rapid control versus the avoidance of adverse effects.
- To aid in choosing a medication, review the patient's past medical and drug history, any collateral history available, any medications already given, the possibility of intoxication, prior similar presentations, any prior adverse reactions, and any management plans that may be available.
- **The safest medication may be the one the clinician has most experience with.**

Ketamine

Dose: 4 mg/kg IM (50 mg/mL)

- **Caution:** available in two strengths, **50 mg/mL (for IM use)** and **10 mg/mL (for IV use)**
- Adequate sedation achieved rapidly compared to benzodiazepines and antipsychotics (Barbic, 2021) (Riddell, 2017).
- Positive features include cardiovascular stability as well as preservation of respiratory drive and airway reflexes.
- If or when IV access is obtained, consider titrating to sedative effect e.g. starting with 0.5-1 mg/kg (of 10 mg/mL).
- In case of emergence phenomena (distressing sensations or psychiatric symptoms as the ketamine wears off), or worsening heart rate and hypertension, consider also using benzodiazepines.

Antipsychotics

Droperidol

Dose: 10 mg IM, 5 mg in patients >65 years old. Maximum 20 mg in 24 h.

- **Contraindicated** in patients with **Parkinson's disease** and **Lewy body dementia**.
- Droperidol has been shown to have lower rates of complication for the suppression of airway protective reflexes, respiratory drive and hypotension compared to benzodiazepines (Isbister, 2010).
- Onset in 3-10 min, peak effect in 30 min (Cressman, 1973).
- All antipsychotics can prolong the QT interval. However, more recent studies for droperidol have shown that the risk of an arrhythmia is <0.1% (Calver, 2015).
- May cause an acute dystonic reaction - observe for extrapyramidal side effects and use procyclidine 5-10 mg oral/IV or benztropine 1-2 mg IM if needed.

Haloperidol

Dose: 5 mg IM. Maximum 12 mg (5 mg if >65 years old) in 24 h.

- **Contraindicated** in patients with **Parkinson's disease** and **Lewy body dementia**.
- More effective if used in combination with lorazepam (e.g. 2 mg IM) (Battaglia, 1997) (Bieniek, 1998).
- May cause QT prolongation. Review ECG if available, discontinue if QTc >500 ms.
- May cause an acute dystonic reaction. Observe for extrapyramidal side effects and use procyclidine 5-10 mg oral/IV or benztropine 1-2 mg IM if needed.

Benzodiazepines

Lorazepam

Dose: 2-4 mg IM, 0.5-2 mg in patients >65 years old. Maximum 4 mg in 24 h.

- Time to onset of sedation after IM dose 15-30 min.

Midazolam

Dose: 5-10 mg IM.

- Shorter time to successful rapid tranquilisation compared to lorazepam and haloperidol.
- May be useful in patients at risk from sympathomimetic features (e.g. in ischaemic heart disease or cocaine-induced psychosis) where transient tachycardia or hypertension may be harmful.
- Respiratory adverse events are more common with benzodiazepines than antipsychotics (Korczak, 2016).
- IV doses may need to be reduced if given after IM doses.
- Large volume injections may need to be given at multiple sites.

Maintenance medications for control of agitation

Patient may require prolonged periods of medications to maintain control of agitation. Liaise with the admitting speciality to come up with an appropriate management plan and involve intensive care if needed. Possible choices for maintaining sedation in non-critical care environments without anaesthetic support include:

- **Diazepam** 0.3 mg/kg titrated dose IV (or oral), repeated as needed (max. 20 mg / 24 h)
- **Lorazepam** 0.03 mg/kg titrated dose IV (or oral), repeated as needed (max. 4 mg / 24 h)
- **Haloperidol** 2.5 mg IM or 2 mg oral, repeated as needed (max. 20 mg / 24 h)
- **Olanzapine** 5-10 mg IM or oral, repeated up to twice in 24 h (max. 20 mg / 24 h)

Post-procedure monitoring and disposition

- Move to and monitor in the most clinically appropriate area
- Attach pulse oximeter, cardiac monitor, NIBP, and etCO_2 , if possible, and record observations regularly over the first 2 hours post-sedation
- Establish and secure IV access
- Perform a 12-lead ECG, blood tests, and further investigations as appropriate
- Liaise with the admitting speciality and formulate a management plan for the patient, involving the mental health team early for presentations related to mental health
- Step down when clinically appropriate

Documentation

- Collateral history
- Rationale for the decision to use rapid tranquilisation
- What de-escalation attempts were made
- Assessment of mental capacity ([RCEM Mental Capacity Act in Emergency Medicine Practice](#), 2017)
- Restraint applied, duration, and indication ([RCEM National Survey on Security and Restraint in the ED](#), 2020)
- Security and/or police involvement
- Sedative strategy and any adverse events
- Other specialities involved and further management plan

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Full version control record

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Version History

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