Worcestershire Acute Hospitals NHS Trust

ADULT RAPID TRANQUILLISATION IN THE EMERGENCY DEPARTMENT (A&E) AND ACUTE MEDICAL UNIT (AMU)

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

INTRODUCTION

Patients presenting to either the emergency department (ED) or other acute care areas such as the acute medical unit (AMU) requiring rapid tranquillisation for their own safety represent a high risk group of patients. Requirement for rapid tranquillisation are commonly due to drug ingestion and psychiatric illness; other causes include diseases such as encephalitis, injury (traumatic brain injury). The confusion / violence / aggression / agitation that may accompany such illnesses presents many challenges to those who have to manage the patient not least the undifferentiated nature of the underlying disease. The decision to undertake emergency Rapid Tranquillisation (RT) should only be done if it is the patient's best interests and all other avenues to gain patient co-operation have been exhausted.

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS:

- Medical practitioners qualified to administer and prescribe tranquillising drugs.
- Qualified Nurse / Practitioner trained to administer tranquillising drugs.
- Medical practitioner capable of providing assisted ventilation should apnoea occur.

Lead Clinician(s)

Dr James France	Consultant Emergency Medicine (A&E), Worcestershire Royal Hospital
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Key amendments:

Date	Amendment	By:
08.03.2011	No amendments made to guideline	James France
12.02.2013	Reviewed with minor amendment to title	James France
01.11.2015	No substantial amendments made	James France
Oct 16	Further extension as per TMC paper approved 22ND July 2015	TMC
November 17	Document extended whilst under review	TLG
24.11.17	Changes to doses of midazolam and lorazepam Changes to requirement for clinical incident reporting and documentation of mental capacity	James France
02.10.2019	Post Incident Debrief	James France
07.09.2021	Amendment to flowchart addition of sentence from test "*In general dosages described are…"*	James France
15.09.2022	Inclusion of ketamine and droperidol; appendices, safety brief, restraint	James France

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INTRODUCTION

Patients presenting to either the emergency department (ED) or other acute care areas such as the acute medical unit (AMU) requiring rapid tranquillisation for their own safety represent a high risk group of patients. Requirement for rapid tranquillisation are commonly due to drug ingestion and psychiatric illness; other causes include diseases such as encephalitis, injury (traumatic brain injury). The confusion / violence / aggression / agitation that may accompany such illnesses presents many challenges to those who have to manage the patient not least the undifferentiated nature of the underlying disease. The decision to undertake emergency Rapid Tranquillisation (RT) should only be done if it is the patient's best interests and all other avenues to gain patient co-operation have been exhausted.

DETAILS OF GUIDELINE

Related trust guidelines

- WAH-KD-026-Use of the Mental Health Act in the Acute Hospital setting
- WAHT-MED-011 Guidelines to prevent and treat delirium in hospital
- WAHT-CG-006 Violence Prevention Reduction and Management of Violence and Aggression Policy

Rationale for guidelines

This guideline is required in addition to the above documents because it is recognised that patients presenting to the ED / AMU represent special challenges in safe patient management:

- Undifferentiated nature of illness requires careful choice of drugs and dosages.

- Emergency situation requires immediate familiarity with drugs and their side-effects.
- Clinicians may be forced initially to have to manage the patient in less than ideal surroundings.
- The often violent nature of the presentation may require multidisciplinary team working including involvement of the police.
- Staff as well as patients are likely to be frightened by the behaviour of a patient requiring RT.
- It is a relatively infrequent occurrence.

Patient groups

Only those patients who have been assessed as lacking capacity and who represent a danger to themselves or others in the acute care area should be considered for RT. The use of RT is for patients who are likely to have an underlying injury or illness that has caused them to be disturbed or behave in a violent or aggressive manner.

- Adults.
- Patients in the ED or acute care areas such as AMU.
- These patients may or may not be accompanied by the police.

This guideline is not designed to include the following patients:

- In-patients e.g. post operative confusion, confusion in the elderly (delirium).
- Psychiatric in-patients.

The aim of Rapid Tranquillisation

To provide sedation as safely and quickly as possible, to a patient who is violent and aggressive to allow further management of that patient; which may include emergency investigation and treatment. RT prevents the patient from harming themselves or others (including staff) whilst maintaining the duty of care that the trust owes to its patients.

The terminology regarding how to describe the use of sedative medications for severely agitated / aggressive patients is debated. In this document the term ‘rapid tranquilisation’ is used as the intent is to counteract excessive psychomotor stimulation (excessive agitation +/-aggression) at the earliest opportunity, and the scenario typically lacks the pre-optimisation of procedural sedation.

Conditions for implementation of Rapid Tranquillisation

- The patient must have been assessed by a senior doctor (middle grade or consultant) as:

-Lacking in capacity and requiring immediate RT to prevent him/her from harming themselves or others within the acute care area.

- All other efforts to try to calm / reassure / gain co-operation from the patient must have been exhausted or deemed inappropriate due to the nature of the presentation including (appendix 2, verbal de-escalation)

  -De-escalation techniques / conflict resolution / seclusion / privacy & quiet.
  -Oral medication e.g. lorazepam 2mg PO (max 6mg/24 hours)

- Discussion with the duty Consultant preferably before RT has taken place, if time allows is recommended

- The clinical notes must clearly document the indication(s) for rapid tranquilisation and the mental capacity assessment (appendix 3, scale for describing level of agitation).

If time allows then discussion with family and the next of kin may be appropriate; however they cannot overrule the clinical decision to provide emergency rapid tranquillisation if it is deemed to be in the patient's best interests who also lacks capacity as defined under the Mental Capacity Act 2005.

Provision of Rapid Tranquillisation

- RT should be provided by the most **senior / experienced doctor** available who is competent at providing sedation and treating the complications or side-effects of the procedure. In particular, the clinician as a minimum should be capable of providing supportive care which involves the use of airway adjuncts such oropharyngeal airways and manual ventilation with bag and mask devices. The aim is to provide RT as safely and quickly as possible using an appropriate drug and dosage that works after the first attempt.

- RT should ideally be carried out in a **setting** which has immediate access to oxygen via high flow reservoir mask, suction, monitoring for oxygen saturations, blood pressure, heart rate and respiratory rate. Furthermore, the availability of equipment and drugs to deal with potential problems should also be ensured; these may include laryngoscope, endotracheal tube, defibrillator, flumazenil, adrenaline, intravenous fluids etc.

- It is recognised that the provision of RT may initially have to take place in less than ideal surroundings, but every effort should be made to have portable equipment ready and a plan to transfer the patient as soon as possible (once the sedative has taken effect) to a high dependency area with the appropriate monitoring facilities and equipment (e.g. in the ED this would be the resuscitation room).

- The **route of administration** in the emergency setting is likely to be intramuscular (IM) this has the benefit of rapid access and minimising the risk of needlestick injury to others. The period of physical restraint required for a single IM injection is also minimised when compared to attempts at intravenous cannulation in the unco-operative patient. The intravenous route has the advantage of slightly more rapid onset; however, it is unlikely to be available for immediate use in the emergency setting. Once the patient has been sedated using the intramuscular route and the

patient is more co-operative then intravenous access should be gained and secured as soon as possible.

- In severely agitated patients (such as those requiring continuous restraint or containment), initial delivery of parenteral medications is rarely achievable intravenously, nor is the full application of standard monitoring/pre-oxygenation. Moving to a standardised intramuscular rapid tranquilisation protocol is associated with reduced time to agitation / aggression control, fewer adverse reactions, and fewer injuries to staff.

- Prolonged restraint should prompt consideration of rapid tranquilisation. Pragmatically, RT will usually require a degree of restraint. Attempts should be made to remove any ongoing restraint at the earliest opportunity. There is concern that continued exertion under restraint can contribute to poor outcomes (likely due to increasing catecholamine levels, worsening hyperthermia, and metabolic acidosis).

- Whilst the police should not normally be called to undertake restrictive practices solely to facilitate clinical interventions, it has been established that there are scenarios in which police support should be requested:
    - if healthcare staff have been injured
    - if appropriate support is not available from healthcare colleagues in a sufficiently timely manner to ensure the safety of all those affected
    - where there is a risk of serious injury or damage, and safety is compromised.

- It is the responsibility of the senior doctor in charge of the RT to ensure any manual restraint does not interfere with the patient's airway, breathing or circulation, for example by applying pressure to the rib cage, neck or abdomen, or obstructing the mouth or nose.

- A **Safety Brief** prior to parenteral rapid tranquilisation should be undertaken if practicable and may include:
    - Roles
    - Intended plan
    - Anticipated problems
    - Restraint considerations
    - Intravenous access plan
    - Plan for moving to resuscitation environment
    - Responsibility for the decision to relax restraint.

Choice of Drug in Rapid Tranquilisation

- The **choice of drug** is dependent of the familiarity of the clinician with the drug and likelihood of side-effects given the emergency presentation and the difficulty in determining the underlying reason for the current violent or aggressive behaviour. The patient's previous drug history should also be considered, particularly recent medication and drugs which have been used in the past.

- In an Emergency Department setting, the use of **ketamine** 4mg/kg IM (IV route - titrate to effect) as a first-line agent for rapid tranquilisation is recommended. Ketamine is associated with shorter times to adequate sedation than benzodiazepines or antipsychotics. This should be delivered intramuscularly if intravenous access cannot be obtained safely. This should, if at all practicable, be

delivered in a resuscitation environment, by staff capable of managing the complications of ketamine rapid tranquilisation and who also have adequate training in anaesthesia and airway management. If administration in a resuscitation environment is not achievable, resuscitation equipment should be immediately available.

- **Droperidol** 5-10mg IM appears to be associated with fewer adverse events than lorazepam or midazolam, and fewer cases requiring additional sedatives compared to haloperidol or midazolam. Historic concerns regarding droperidol-related QT interval prolongation have not been replicated in subsequent studies.
  It may be a less-suitable option if a patient is known to take antipsychotic medications, or if there is a suspicion of a presentation linked to antipsychotic use (e.g. anticholinergic syndrome or akathisia).

- In the acute care setting a benzodiazepines remain an option if past medical history is uncertain (history of cardiovascular disease, uncertainty regarding current medication, or the possibility of current illicit drug / alcohol intoxication). Consider using either **lorazepam** 4mg IM or **midazolam** 5mg IM, do not use both. Lorazepam is longer acting, however it is stored in the fridge, needs to be mixed 1:1 with water for injection or sodium chloride 0.9% before injecting, supplies can be erratic and absorption may be no better than orally. Midazolam is a short acting, readily available benzodiazepine that requires no mixing before injection and is stored at room temperature. It has a significantly quicker onset of action and more rapid time to arousal than lorazepam or haloperidol. Midazolam 5mg IM is recommended however, experience has shown that doses between 7.5-15mg IM can be required initially; clinicians should balance the risks of the need for prolonged restraint (inadequate dosing) vs likelihood of over sedation. **Flumazenil** should be readily available irrespective of which benzodiazepine is used.

- **Haloperidol** may also be used in the emergency setting, particularly those with a confirmed history of previous significant antipsychotic exposure, and response to haloperidol and that the current episode is likely to be due to acute psychosis in the absence of illicit drug / alcohol ingestion. **Haloperidol and lorazepam** have been demonstrated to have a longer time to successful rapid tranquilisation than midazolam. When used in combination (as haloperidol 5mg IM + lorazepam 2mg IM) they appear to achieve better sedation (with no increase in adverse effects) compared to using haloperidol or lorazepam alone

- In the event of failure of either the benzodiazepine or combination of benzodiazepine and haloperidol when given intramuscularly to produce adequate sedation then proceed to gain intravenous access and administer 5mg of diazemuls® intravenously. **Flumazenil** should be readily available and 'to hand' (not locked in a cupboard) as a precaution if resorting to IV diazemuls after IM medication.

- Once RT has been achieved the patient should be moved to an appropriate area to allow continued monitoring, **establishment of intravenous access** and treatment of any complications related to sedation. Emergency investigation and treatment should be undertaken as soon as possible. Provision of further bolus doses of intravenous sedative may be necessary e.g. 2-3mg IV of midazolam or 2-5mg of diazemuls until a definitive management plan has been arranged. Consider early involvement of other specialties e.g. psychiatry, intensive care, medicine.

- Suggested drug doses for early rapid control:

  - Ketamine 4mg/kg IM (IV route – titrate to effect)
  - Droperidol 5-10mg IM
  - Midazolam 5mg IM (may require 7.5-15mg initially)
  - Lorazepam 4mg IM
  - Halopridol 5mg IM plus Lorazepam 2mg IM

  Strongly consider critical care support if full first doses in the box above have not been effective.

Drug Notes

- In general dosages described are for 'average' sized adults, the dosage may need to be varied according to body habitus, age (reduce dose by half in the over 65yrs) and according to other medication which may have recently been taken.

- When administering IM injections use the smallest volume possible, volume should not exceed 5mls. Large volume intramuscular injections may need to be administered at multiple sites.

- In the clinical context of severely agitated / aggressive patient, the dissociative effects of **ketamine** appear to reduce adrenergic features, and the sympathomimetic effects of ketamine are unlikely to cause significant adverse consequences. The speed of onset, cardiovascular stability, and preservation of respiratory drive/airway reflexes with ketamine administration are potentially beneficial compared to other agents in the context of rapid tranquilisation for severe agitation / aggression. High rates of intubation after ketamine administration are predominantly seen in pre-hospital rather than ED settings and are likely related to facilitating safe transport to hospital. Following ketamine therapy, if a patient demonstrates worsening tachycardia or hypertension, this may increase cardiac risk due to synergistic sympathomimetic effects. Additional treatment with benzodiazepines should be considered in these circumstances.

  Ketamine is available in the following strengths 100mg/ml (often issues with supply), 50mg/ml and 10mg/ml (appendix 4).

- **Benzodiazepines** have no anti-psychotic activity but have useful sedative and anxiolytic effects. Toxicity, such as over-sedation and respiratory depression (respiratory rate <10 breaths per minute or oxygen saturations <90%), can occur at high doses. These effects are rapidly reversed with Flumazenil (Anexate®). Benzodiazepines are well tolerated, with a high therapeutic index, and are not implicated in causing the serotonin syndrome, neuroleptic malignant syndrome, QTc prolongation or dystonic reactions. They have proven safety and efficacy in animal experiments and widespread clinical use for sympathomimetic drug related agitation. They also possess dose dependent efficacy that is easily titratable, and have established seizure prophylaxis and seizure terminating activity. Benzodiazepines have no arrhythmogenic potential with therapeutic or toxic exposures, and hypertensive and arrhythmia preventive activity in sympathomimetic drug toxicity.

- **Midazolam** (Hypnovel®) is available in strengths of 1, 2 or 5mg per ml.

- **Lorazepam** (Ativan ®) is kept in the fridge in a strength of 4mg per ml.

- Diazepam should not be used via the intramuscular route – it is extremely irritant and absorption is slow and erratic. Diazemuls® emulsion may be administered 5mg/ml into a large vein.

- **Flumazenil** (Anexate®) is a benzodiazepine antagonist which may be used to reverse the effects of benzodiazepines that have been administered during sedation procedures. It should not be used in patients presenting with an undifferentiated overdose due to deliberate self harm. Presentation: clear colourless solution 100micrograms/ml in a 5ml ampoule. Side Effects: hypertension, dysrhythmias, vomiting, dizziness, flushing, anxiety, headache and convulsions. Avoid, if possible, in known status epileptics and raised intra-cranial pressure. It acts within 30-60 seconds and lasts 15-140 minutes, its duration of action is shorter than that of the benzodiazepines it is antagonising. Administer 200micrograms IV over 15 seconds, then 100micrograms IV at 60 second intervals. Usual dose ranges 300-600micrograms; max total dose 1mg.

- **Haloperidol** is a butyrophenone anti-psychotic or neuroleptic. It generally tranquillises without impairing consciousness. Side-effects include extrapyramidal symptoms (parkinsonian symptoms, dystonia, akathisia, tardive dyskinesia), neuroleptic malignant syndrome, prolongation of the QTc interval with sudden cardiac death and seizures. Avoid in patients with known cardiac disease or who may have ingested illicit drugs. Avoid in Parkinson's Disease and Lewy-Body dementia. Haloperidol should not be administered unless procyclidine or benzatropine are immediately available. Acute dystonia may be treated with either benzatropine 2mg IV or procyclidine 5mg IV, repeated as necessary after a few minutes. Dramatic resolution of symptoms usually occurs after a few minutes.

- The following drugs **should not** be used to provide RT:

  -IM diazepam
  -Thioridazine
  -IM depot anti-psychotics
  -Olanzapine
  -Risperidone
  -Zuclopenthixol acetate

  Chlorpromazine should not routinely be used for rapid tranquilisation, however it may have a role in cases of suspected serotonergic toxicity with severe psychosis or hyperthermia (consider Chlorpromazine 25–50 mg IV or IM in addition to benzodiazepines).

Monitoring / Resuscitation, Investigations and Documentation

- Common monitoring / resuscitation needs:
  - Physiological observations, routine ED sedation monitoring (including $ETCO_2$)
  - Rehydration
  - Correction of electrolyte / glucose / acid-base abnormalities
  - Correction of hyperthermia if required
  - Prevention of or management of potential sequelae (e.g., rhabdomyolysis, disseminated intravascular coagulation)
  - Attempts should also be made at the earliest opportunity to obtain a collateral history (where available).

- Investigations, directed towards possible causes (appendix 5):
    - Blood gas (to include blood glucose), FBC, U&E, LFT, troponin, CK, Coag. Other tests as clinically indicated; e.g., blood cultures, trauma bloods, overdose bloods, toxicology screen, appropriate metabolic screen
    - Electrocardiogram (ECG)
    - Imaging if clinically indicated

  Remember to consider the possibility of trauma leading to abnormal behaviour (eg. head injury) as well as being a consequence of agitation / aggression or efforts to restrain patient as well as the more common toxicological or psychiatric causes.

- Appropriate documentation to support review is helpful. In-addition to your standard notes, consider recording:
    - relevant features from the collateral history
    - features supporting the decision to progress to RT
    - attempts to achieve verbal/environmental de-escalation
    - assessments of mental capacity
    - restraint applied, duration and indication
    - security or police involvement, including use of force, controlled energy device use, etc.
    - sedative strategy and any adverse events
    - involvement of all specialties

De-escalation from repeated rapid tranquilisation

At the earliest opportunity, aim to achieve de-escalation from a high dependency area into the department's best environment for managing the patient.
If repeat doses of intramuscular sedatives are to be used for a patient with a suspected mental health presentation, this should ideally be in liaison with mental health services pending mental health practitioner review.
If a non-psychiatric presentation is suspected, and sedative requirements for admission would be beyond the scope of ward level care, critical care input will be required.

Post Incident Review

Following the use of rapid tranquillisation a post incident review should take place as soon as possible but within 72hrs. The review should involve those staff present (doctors, nurses, MHL, security, police etc.) and aim to discuss any concerns, ensure the safest and least restrictive practises were followed and to consider if any changes to existing policy are required (eg. treatment approach, education, training etc.)

The post incident review should be documented (person leading the debrief) by completing a brief DATIX confirming time and date of debrief, any significant issues and any recommendations from the de-brief. The DATIX submission should keep the anonymity of those taking part in the debrief.

MONITORING TOOL

This should include realistic goals, timeframes and measurable outcomes.

How will monitoring be carried out?

Who will monitor compliance with the guideline?

STANDARDS	%	CLINICAL EXCEPTIONS
Critical incident forms reviewed by patient safety group.		

REFERENCES

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Appendix 1 – ED / AMU Rapid Tranquillisation Flowchart

Assessment by senior doctor:
- Patient lacks capacity
- Patient represents a significant danger to him/herself or others
- Patient requires emergency treatment / investigation
- Patient is severely agitated

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Non drug measures undertaken if possible:
- De-escalation techniques / exclusion
- Oral medication – lorazepam 1-2mg (max 6mg per day)

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Preparation to ensure RT as safe as possible:
- Senior Doctor with critical care experience with patient
- Drug drawn up and prepared correctly (Anticlonic available if applicable)
- Oxygen and high flow reservoir mask on patient/immediately ready
- Monitoring equipment (ECG, pulse oximeter, BP)
- Equipment in case of complications (airways, suction, BMV)
- Short Safety Brief
- Adequate number of personnel

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Choice of drug(s):

Either **Ketamine 4mg/kg IM** (or titrate to effect IV)
Or **Droperidol 5-10mg IM**

Alternatives include: midazolam (5-10mg IM), lorazepam (4mg IM) or haloperidol (5mg IM +/- 2mg lorazepam IM) could be considered. Higher concentrations than typically stocked may be required for IM injection. Large volume injections may need to be administered at multiple sites.

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Once sedative taken effect:
- Establish and secure intravenous access
- Monitor in a high dependency area (Resus Room)
- Maintain sedation with **IV** bolus medication until definitive management plan arranged.
- Correct electrolyte / glucose / acid-base abnormalities, correct hyperthermia, look for evidence of DIC or rhabdomyolysis
- Institute other emergency treatments and investigations as necessary.

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Document clearly in the clinical notes:
- Indication(s) for RT & any attempts at de-escalation
- Mental capacity assessment.
- Restraint, Collateral history, Description of behaviour, Police involvement.

Notes:

- In general dosages described are for 'average' sized adults, the dosage may need to be varied according to body habits, age (reduce dose by half in the over 65yrs) and according to other medication which may have recently been taken.
- When to consider **Haloperidol** - Confirmed history of previous significant antipsychotic exposure, and response to haloperidol and that this current episode is likely to be due to acute psychosis in the absence of illicit drug / alcohol ingestion.
- Procyclidine 5mg IV bolus or Benzatropine 2mg IV bolus for treatment acute dystonia secondary haloperidol.
- **Flumazenil** should be available as a precaution if using parenteral benzodiazepines. Initial dose 200mcg slowly.
- Do not give Diazepam via the intramuscular route.

Maintenance of Sedation

Diazepam
0.3mg/kg IV

Lorazepam
0.03mg/kg IV

Chlorpromazine 25-50mg IV in-addition to benzodiazepines for cases of **suspected serotonin toxicity** with severe psychosis or hyperthermia

Appendix 2 - Verbal de-escalation

Verbal de-escalation is a valuable tool with which to facilitate patient care and potentially avoid any requirement for restraint. Staff should make attempts to verbally de-escalate the situation. This may feel futile if a patient will not, or is unable to engage, but is an important step in ensuring that the use of restraint and rapid tranquilisation are justified. A clear record of de-escalation will also provide reassurance to family and the public in cases where an adverse outcome leads to a review.
De-escalation is a continuous process and repeat attempts may be appropriate at any point in the patient's care.

Domains of De-escalation	
Respect personal space	○ Identify exits ○ Stay out of arm's reach
Do not be provocative	○ Ensure body language is non-confrontational ○ Keep hands visible ○ Do not challenge, insult, or engage in argument
Establish verbal contact	○ Avoid multiple staff talking to the patient ○ Introduce yourself, explain why you are there, reassure the patient you are aiming to keep them safe
Be concise	○ Short sentences, give time to respond ○ Repetition may be needed
Identify wants and feelings	○ Identify expectations, empathise
Listen closely	○ Use clarifying statements
Agree, or agree to disagree	○ Consider fogging techniques (Agree with the truth, agree in principle, or agree with the odds)
Set clear limits	○ Clearly inform patient as 'matter-of-fact' not as a threat
Offer choices and optimism	○ Offer acts of kindness ○ Offer oral sedative medications
Debrief patient and staff	○ Explain why intervention was necessary. ○ Restore therapeutic relationship. ○ Identify potential improvements.

If sedation or general anaesthesia is likely to be required, do not offer food or drink.

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Appendix 3

Example of a tool for quantifying the level of agitation in the emergency department – The Sedation Assessment Tool

Score	Responsiveness	Speech
3	Combative, violent, out of control	Continual loud outbursts
2	Very anxious and agitated	Loud outbursts
1	Anxious/restless	Normal/talkative
0	Awake and calm/cooperative	Speaks normally
−1	Asleep but rouses if name is called	Slurring or prominent slowing
−2	Responds to physical stimulation	Few recognizable words
−3	No response to stimulation	None

Reference:
Calver L, Stokes B, Isbister G. Sedation assessment tool to score acute behavioural disturbance in the emergency department. EMA 2011, 23; 732-740

Appendix 4

Ketamine IM Injection Volumes

When administering IM injections use the smallest volume possible, volume should not exceed 5mls. Large volume intramuscular injections may need to be administered at multiple sites.

Ketamine is available in the following strengths 100mg/ml (often issues with supply), 50mg/ml and 10mg/ml.

Weight	Dose 4mg/kg	Volume 100mg/ml strength	Volume 50mg/ml strength
50kg	200mg	2.0 ml	4.0 ml
60kg	240mg	2.4 ml	4.8 ml
70kg	280mg	2.8 ml	5.6 ml
80kg	320mg	3.2 ml	6.4 ml
90kg	360mg	3.6 ml	7.2 ml
100kg	400mg	4.0 ml	8.0 ml

Potential Complications of Ketamine

● **Apnoea** – more likely to occur after rapid IV bolusing of ketamine but is rare. Airway repositioning or brief bag-valve-mask ventilation has been occasionally required

● **Airway misalignement / Noisy Breathing** (uncommon) – basic airway repositioning is usually sufficient to resolve this uncommon event. So called 'ketamine breathing', deep sighing respirations, can be misinterpreted as stridor, and again is minimised with correct head positioning.
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● **Laryngospasm** - rare transient event, the reported incidence of intubation of laryngospasm is 0.02%. The risk appears higher if stimulation of the posterior pharynx, or who have active respiratory disease (e.g. URTI). Again, airway and patient positioning and occasional bag-valve-mask ventilation will usually suffice.

● **Emergence Phenomenon** - ketamine is known to induce agitation and hallucinations as the dissociative effects wear off, can effect up to 1 in 3 adults. This can be mitigated with benzodiazepines on occurrence in the recovery period, however prophylactic administration is NOT necessary.

● **Hypersalivation & Lacrimation** evidence suggests co-administration of anti-cholinergic agents (e.g. atropine) is not necessary.

Appendix 5 – Possible Causes of Abnormal Behaviour / Agitation / Aggression

S	**Substrates**	Glucose (high/low), thiamine deficiency
	Sepsis	
M	**Meningitis**	All CNS infections, AIDS, encephalitis, abscess,
	Mental Illness	Psychosis, mania, non-concordance
A	**Alcohol**	Intoxication / withdrawal
	Accident	Head injury, CVA
S	**Seizing**	Post Ictal
	Stimulants	Cocaine, amphetamines, caffeine, LSD, PCP,
H	**Hyper**	BP, thyroid, pCO_2, hyperthermia
	Hypo	BP, thyroid, pO_2, hypothermia
E	**Electrolytes**	Hyper/hypo Na, Ca
	Encephalopathy	Hepatic, HIV, uraemia, HTsive, Reye's
D	**Drugs**	Neuroleptic malignant syndrome, Serotonin syndrome, Withdrawal, Intoxication
	Don't forget other drugs	CO, Li, Salicylates, steroids, NMDA

Notes on Acute Behavioural Disturbance (ABD)

Acute behavioural disturbance (also previously called excited delirium, acute behavioural disorder, or agitated delirium) is an umbrella term used to describe a presentation which may include abnormal physiology and/or behaviour.

It is important to recognise that ABD should not be considered a diagnosis or syndrome, but rather a clinical picture with a variety of presenting features and potential causes. The term ABD is widely recognised by both in-hospital and pre-hospital emergency care providers, and by the police in the UK.

The below represent signs which may be present in ABD and can potentially be identified prior to clinical monitoring. One or more features may be present in ABD.

- Agitation
- Fear, panic
- Tachycardia
- Rapid breathing
- Hot to touch, sweating
- Sustained non-compliance with police or ambulance staff
- Constant physical activity
- Bizarre behaviour (incl. paranoia, hypervigilance)
- Unusual or unexpected strength
- Pain tolerance, impervious to pain

These features have their origin in the literature on Excited Delirium (a contested diagnosis, which is not recognised in the UK). Unfortunately, there is a lack of evidence studying ABD in a UK context, and this literature therefore represents the best available information to identify patients at risk who are presenting with ABD.

CONTRIBUTION LIST

Key individuals involved in developing the document

Name	Designation
Dr James France	A&E Consultant, Worcestershire Royal Hospital
Dr Steve Graystone	Associate Medical Director/Consultant Anaesthetist

Circulated to the following individuals for comments

Name	Designation
	DMD Urgent Care
	DMD SSCD
	CD Emergency Medicine
	CD Acute Medicine
	CD ICU
	Clinical Lead Emergency Medicine Alexandra Hospital
	Clinical Lead Emergency Medicine WRH
	Clinical Lead Acute Medicine, AH
	Clinical Lead Acute Medicine, WRH
	ED Matron, Alexandra Hospital
	ED Matron, Worcestershire Royal Hospital
	Matron, Critical Care
	ED Pharmacist, Alexandra Hospital
	ED Pharmacist, Worcestershire Royal Hospital
	Clinical Lead Mental Health Liaison, Alexandra Hospital
	Clinical Lead Mental Health Liaison, WRH
	Critical Care Outreach, Alexandra Hospital
	Critical Care Outreach, Worcestershire Royal Hospital

Circulated to the chair of the following committee's / groups for comments

Name	Committee / group
	Medicines Safety Committee
	Patient Safety Committee

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page;

NHS Worcestershire Acute Hospitals NHS Trust

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form
Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	x	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	

Details of individuals completing this assessment	**Name**	**Job title**	**e-mail contact**
Date assessment completed			

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	**Title:** Adult Emergency Rapid Tranquillisation in the Emergency Department (A&E) and Acute Medical Unit			
What is the aim, purpose and/or intended outcomes of this Activity?	See body of document			
Who will be affected by the development & implementation of this activity?	❑ Service User ❑ Patient ❑ Carers ❑ Visitors		❑ Staff ❑ Communities ❑ Other _____	
Is this:	❑x Review of an existing activity ❑ New activity			

	❑ Planning to withdraw or reduce a service, activity or presence?
What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	See body of document
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	See body of document
Summary of relevant findings	

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age				See body of document
Disability				See body of document
Gender Reassignment				See body of document
Marriage & Civil Partnerships				See body of document
Pregnancy & Maternity				See body of document
Race including Traveling Communities				See body of document
Religion & Belief				See body of document
Sex				See body of document
Sexual Orientation				See body of document
Other Vulnerable and Disadvantaged				See body of document

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)				
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)				See body of document

Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
		.		
How will you monitor these actions?	See body of document			
When will you review this EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)	See body of document			

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	Completed on behalf of owner
Date signed	December 2022
Comments:	
Signature of person the Leader Person for this activity	
Date signed	
Comments:	

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	
2.	Does the implementation of this document require additional revenue	
3.	Does the implementation of this document require additional manpower	
4.	Does the implementation of this document release any manpower costs through a change in practice	
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.