Delirium – Adult Inpatient

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Note: This algorithm is not intended for patients with alcohol withdrawal related delirium.

INITIAL PRESENTATION/ASSESSMENT

Patient at risk for delirium[1]

Presence of clinical features or positive screen for delirium[2,3]?

Yes

- Notify Primary or on-call Team
- See Appendix C for Safety and Environmental Interventions and implement as indicated

No

See Appendix C for Safety and Environmental Interventions and implement as indicated

CLINICAL EVALUATION

- History and Physical and chart review
  - Confirm history with family/caregivers
  - Physical examination with attention to neurological status
  - Review current and home medications
    - Confirm home medication use with family/caregivers
    - Consider drug overdose versus withdrawal, serotonin syndrome and/or neuroleptic malignant syndrome
    - Review for correct dosing based on age and clinical condition
    - Avoid abrupt discontinuation of medications with potential for dependence and/or withdrawal syndrome
    - Consider ongoing need for medications that may contribute to delirium (see Appendix A)
    - Review history for alcohol and substance use/misuse
  - Clinical interview and mental status exam
  - Consider evaluation using standardized tools (CAM and/or MDAS)
- Consider the following as clinically indicated:
  - CBC with differential, basic metabolic panel with calcium, liver function tests, oxygen saturation/arterial blood gas, troponin T, albumin, thyroid function tests, ammonia, cortisol
  - Urinalysis, urine culture, blood cultures, cerebral spinal fluid studies
  - Serum/urine drug screen
  - Chest x-ray and EKG
  - EEG, CT head, MRI brain
- Consultations as appropriate
- Treat acute severe causes such as pain, sepsis, hypoxia, electrolyte disturbances, and medication toxicities

INTERVENTION

See Page 2

CAM = Confusion Assessment Method
ICDSC = Intensive Care Delirium Screening Checklist
MDAS = Memorial Delirium Assessment Scale

[1] See Appendix A for risk factors and contributing factors
[2] See Appendix B for clinical features of delirium
[3] Routine screening in the Critical Care Unit and Advanced Support Unit (ASU) performed with the ICDSC and screening for Supportive Care patients performed with the MDAS. 3D CAM also routinely used by multiple services.

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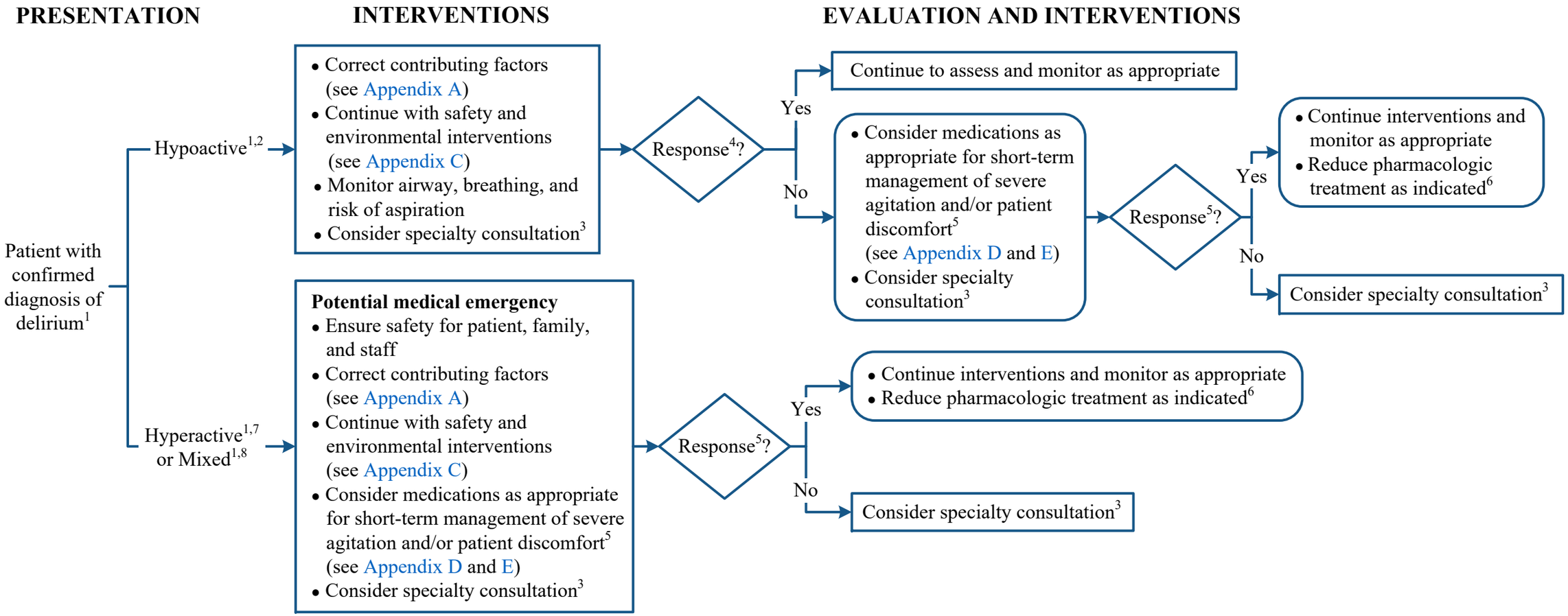

[1] Follow algorithm based on delirium type at time of evaluation
[2] Hypoactive clinical features include withdrawal, flat affect, lethargy, and/or diminished responsiveness
[3] Consider specialty consultation with Pharmacy, Psychiatry, Neurology, Supportive Care, Geriatrics, and/or Anesthesiology as indicated
[4] Response to interventions should be based on continuous evaluation over a period of time and not on a single evaluation
[5] Specialty specific management of delirium may include dexmedetomidine (ICU or palliative care setting), combination of haloperidol and lorazepam (palliative care setting or patients with severe agitation) or combination of other psychotropics as deemed appropriate by consultants
[6] Chronic use of antipsychotic therapy may not be indicated in the absence of underlying psychiatric conditions (*e.g.,* schizophrenia)
[7] Hyperactive clinical features include hallucinations, agitation, restlessness, combativeness, pulling at catheters and/or tubes
[8] Mixed clinical features include fluctuations between hyperactive and hypoactive delirium

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APPENDIX A: Risk Factors and Contributing Factors for Delirium

Patient Characteristics	• Age > 64 years • Sensory impairment (visual and/or hearing)
Metabolic Disturbance	• Hypoxia • Hypercapnia • Hypo or Hyperglycemia • Hypo or Hypernatremia • Hypercalcemia • Impaired liver function and/or kidney function • Thyroid disorders
Drugs[1]	• Polypharmacy • Medications with anticholinergic effects[2,3] (*e.g.*, scopolamine, promethazine, prochlorperazine, diphenhydramine, hydroxyzine, oxybutynin, hyoscyamine, tricyclic antidepressants) • Opioids • Benzodiazepines • Zolpidem, eszopiclone, zaleplon • Cyclobenzaprine, baclofen • Anticonvulsants (*e.g.*, phenytoin, phenobarbital, levetiracetam) • Corticosteroids (*e.g.*, methylprednisolone, prednisone) • Histamine-type 2 receptor antagonist (*e.g.*, famotidine) • Digoxin (particularly with elevated blood levels) • Anti-Parkinson agents ◦ Anticholinergics[3] (*e.g.*, cogentin) ◦ Adjunctive agents (*e.g.*, amantadine, selegiline) ◦ Dopamine agonists (*e.g.*, bromocriptine, ropinirole) ◦ Carbidopa/levodopa • Sympathomimetics (*e.g.*, methylphenidate, amphetamine, dextroamphetamine) • Select antimicrobials including beta-lactams (penicillins, cephalosporins, carbapenems), fluoroquinolones (*e.g.*, ciprofloxacin), and voriconazole

Pain Management	Unrelieved pain
Cancer Therapies	• Chemotherapy agents (*e.g.,* ifosfamide, methotrexate, cytosine arabinoside) • Biotherapy agents [*e.g.,* interleukin-2 (IL-2), interferon-alpha, blinatumomab] • Chimeric antigen receptor (CAR) T-cell therapy • Supportive therapy agents (*e.g.,* opioids, benzodiazepines, corticosteroids)
Disease/condition Related	• Prior history of delirium • History of cognitive impairment including dementia • Direct and indirect effects of primary brain tumors • Central nervous system conditions (*e.g.*, metastasis, stroke, seizures) • Paraneoplastic syndromes (rarely) • Terminal stages of disease/end of life • Alcohol or drug (*e.g.*, opioids, benzodiazepines) intoxication or withdrawal • History of alcohol or substance misuse • Psychosis, schizophrenia, depression, and/or anxiety • Hypertensive crisis • Posterior reversible encephalopathy syndrome (PRES) • Urinary retention and/or fecal impaction • Frailty • Infection • Anemia requiring transfusion
Other	• Fall Risk (Hester Davis Falls Risk Assessment score ≥ 13) • Use of restraints • Use of indwelling urinary catheters • Recent discharge from acute hospital • Patient with recent history or undergoing anesthesia/surgery • Immobility • Lack of sleep

[1] Consider Pharmacy consult for medication review
[2] List is not all inclusive
[3] Seek specialty consultation in patients with toxicity

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APPENDIX B: Clinical Features of Delirium

- Acute onset
- Confusion, disorientation, impaired reality testing
- Inability to pay attention (distractibility)
- Psychomotor agitation or retardation
- Illusions (misperceptions) and hallucinations (usually visual)
- Diurnal variation (worse at night, early AM)
- Sleep-wake cycle disruption
- Fluctuating course, lucid intervals
- Autonomic dysfunction
- Fear and anxiety
- Delusions, especially with paranoid themes

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APPENDIX C: Safety and Environmental Interventions

Category	Interventions
Prevent accidental self harm	• Implement Comprehensive Managed Fall Protection Program as per policy • Implement strategies to prevent self removal of lines, tubes, and drains. See interventions for close observation and physical environment. • Avoid catheterizations • Remove lines, tubes, and drains as soon as indicated • Physical restraints if other measures are unsuccessful
Close observation	• Nurse • Sitter
Physical agitation and physiological instability	Reassess for consideration of transfer to next level of care
Physical environment	• Adequate, but not excessive, sensory stimulation • Sleep promotion strategies ◦ Minimize disruption of sleep-wake cycle ◦ Avoid long periods of daytime sleep • Lights on during day • Maximize mobility • Frequent reorientation (use of clocks, calendars, and updates on whiteboard) • Address sensory deficits (*e.g.,* eyeglasses, other vision aids such as magnifiers and special lighting, hearing aids, amplifying devices) • Address language barriers as indicated through the use of Language Assistance program and provision of language specific patient education materials • Night: low level background light and sound (music or television) maintained • Family presence
Provide reassurance and education to patient and caregivers	• Communicate and educate about delirium and delirium management • Encourage family members to take breaks

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APPENDIX D: Suggested Medications for Management of Delirium For All Inpatient Care Areas

Note: Oral formulations should be avoided in patients who cannot safely swallow or who are at risk for aspiration

Therapeutic Class	Medication	Typical Initial Dose	Recommended Maximum Dose	Onset of Action	Comments/Cautions/Adverse Reactions
Typical Antipsychotics	Haloperidol (Haldol®)	**IV:** Age ≥ 65 years: 0.5-2 mg every 6 hours PRN Age < 65 years: 2-5 mg every 6 hours PRN **PO:** Age ≥ 65 years: 0.5-2 mg every 12 hours PRN Age < 65 years: 2-5 mg every 12 hours PRN **Loading regimen for hyperactive delirium:** Age ≥ 65 years: 0.5 mg IV Age < 65 years: 2 mg IV Repeat dose every 20-30 minutes until patient is calm, then schedule 25% of total loading dose IV every 6 hours	**IV:** 30 mg/day **PO:** 30 mg/day	**IV:** ≤ 20 minutes **PO:** 1-2 hour(s)	• Likely of greatest utility in acute management of hyperactive delirium (*i.e.*, establishing initial control and PRN for breakthrough agitation) • QTc prolongation (dose dependent)/risk of torsades de pointes: ○ Obtain 12-lead EKG at baseline and consider repeating every 48-72 hours ○ Caution with QTc (QTcF) > 450 ms or increase by 25% or more from baseline ○ Not recommended if QTc (QTcF) > 500 ms • Extrapyramidal reactions (acute dystonia, akathisia, parkinsonism, tardive dyskinesia) – higher incidence relative to atypical antipsychotics • Hypotension, particularly with IV administration • Neuroleptic malignant syndrome has been reported with antipsychotic administration (manifests as hyperpyrexia, muscle rigidity, autonomic instability) • May lower seizure threshold
Atypical Antipsychotics	Quetiapine (Seroquel®)	**PO:** 25-50 mg every 12 hours Hepatic impairment: 12.5 mg every 12 hours Age > 60 years: 12.5-25 mg every 12 hours	400 mg/day	1.5 hours	• Likely of greatest benefit as maintenance therapy for hyperactive/mixed delirium; can be considered for hypoactive delirium unresponsive to non-pharmacologic management • May cause hyperglycemia; cases of diabetic ketoacidosis and hyperosmolar coma have been reported • Orthostatic hypotension, especially upon initiation and titration of therapy • QTc prolongation (dose dependent)/risk of torsades de pointes; ○ Obtain 12-lead EKG at baseline and consider repeating every 48-72 hours ○ Caution with QTc (QTcF) > 450 ms or increases by 25% or more from baseline ○ Not recommended if QTc (QTcF) > 500 ms • Neuroleptic malignant syndrome has been reported with antipsychotic administration (manifests as hyperpyrexia, muscle rigidity, autonomic instability) • May lower seizure threshold • Extrapyramidal reactions may occur, but are less common than with typical antipsychotics • Metabolized by CYP450 enzyme system; caution with concomitant use of CYP450 inhibitors and inducers • IM administration contraindicated in patients with thrombocytopenia
	Olanzapine (Zyprexa®; Zyprexa Zydis®)	**PO/ODT:** 2.5-5 mg nightly Age > 60 years: 2.5 mg nightly Parenteral formulation non-formulary	20 mg/day	6 hours	
	Ziprasidone (Geodon®)	**PO:** 20 mg every 12 hours **IM:** 10 mg every 2 hours PRN **or** 20 mg every 4 hours PRN	**PO:** 160 mg/day **IM:** 40 mg/day	**PO:** 6-8 hours **IM:** ≤ 60 minutes	

ODT = oral disintegrating tablet

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APPENDIX E: Suggested Medications for Management of Delirium in Critical Care Unit or Advanced Support Unit (ASU) Only

Therapeutic Class	Medication	Typical Initial Infusion Rate	Recommended Maximum Infusion Rate	Onset of Action	Comments/Cautions/Adverse Reactions
Alpha Agonist	Dexmedetomidine (Precedex®)	**IV infusion:** 0.2 mcg/kg/hour	1.4 mcg/kg/hour	Immediate	• Refer to Critical Care Sedation for Mechanically Ventilated Adult Patients or ASU Sedation for Mechanically Ventilated Adult Patients order set for treatment of delirium in mechanically ventilated patients • Refer to ICU/ASU Dexmedetomidine for Non-Mechanically Ventilated Patients order panel for treatment of delirium in non-mechanically ventilated patients • Caution with use of > 0.7 mcg/kg/hour in non-mechanically ventilated patients • Bradycardia, hypotension • Do not use if heart rate < 60 bpm or MAP < 65 mmHg

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