DIAGNOSTIC CRITERIA

- Disturbances of consciousness and attention.
- Changes in cognition.
- Perceptual disturbances.
- Abrupt onset.
- Fluctuating symptoms
- Disturbance caused by the direct physiological consequence of a general medical condition etc.

COMMON ASSOCIATED FEATURES

- Increased or decreased psychomotor activity
  - Hyperactive vs hypoactive delirium
- Disorganization of thought process
- Disturbed sleep-wake cycle.
  - Sundowning
- Impaired judgment

COMMON ASSOCIATED FEATURES (CNTD)

- Emotional disturbances. (depression, fear, anger, apathy, anxiety, sadness etc.)
  - Farrell and Ganzini
  - Valan and Hilty
- 23%-45% of patients referred for depression were subsequently given a diagnosis of Delirium

RED FLAGS

- Altered mental status
- Change in mental status
- Confusion
- Disorientation
- Dementia
- Memory problems
- Depression
- Agitation
- Psychosis
- Character problem
EPIDEMIOLOGY
- Prevalence at medical admission: 10%-31%
- Older postoperative patients: 15%-53%
- Patients in ICUs: 70%-87%

PREDISPOSING FACTORS
- Advanced age
- Dementia
- Brain injury
- History of delirium
- Sensory impairment
- Prolonged sleep deprivation
- Postoperative state, ICU stay
- Functional status
- Malnutrition, dehydration
- History of alcohol abuse

PATHOGENESIS
- Decreased Acetylcholine activity.
- Disruption of the dorsal segmental pathway -projects from reticular formation to thalamus
- Hyperactivity of the locus ceruleus -noradrenergic neurons

CAUSES OF DELIRIUM

CNS DISORDERS
- Stroke
- Seizure
- Meningitis
- Head trauma
- Degenerative diseases
- Epidural or subdural hematoma
- Neoplasm
- Hypertensive encephalopathy

CARDIOPULMONARY DISORDERS
- CHF
- MI
- Cardiac arrhythmia
- Hypotension
- Hypoxia
- Respiratory failure
- Shock
- Carbon dioxide narcosis
METABOLIC DISORDERS
- Acid-base imbalance
- Fluid or electrolyte imbalance
- Hepatic failure (hepatic encephalopathy)
- Renal failure (uremic encephalopathy)
- Hypoglycemia
- Diabetic ketoacidosis
- Endocrinopathies (thyroid, pituitary, adrenal etc.)
- Anemia

INGESTION OR INTOXICATION
- Medications
  - Drugs of abuse
  - Toxins
    - Carbon monoxide, heavy metals
    - Organophosphates, anticholinesterase

OTHERS/SYSTEMIC ILLNESS
- Infection (pneumonia, UTI, sepsis)
- Neoplasm
- Hypothermia or hyperthermia
- Severe trauma
- Deficiencies (thiamine, Folic acid, Vit B12, etc.)
- Sleep deprivation
- Post operative states.

ASSESSMENT OF THE PATIENT WITH DELIRIUM
- Physical status
  - Safety
  - History
    - Physical and neurological examination
    - Review of vital signs and anesthesia record
    - Review of medical records
    - Careful review of medications
- Mental status
  - Interview
  - Cognitive tests (mini-mental status exam, clockface drawing)
  - Use of Delirium rating scale

BASIC DIAGNOSTIC TESTS
- CMP
- CBC
- VDRL
- EKG
- C-XRAY
- UDS
- URINALYSIS
- BLOOD GAS
- SERUM DRUG LEVELS

ADDITIONAL DIAGNOSTIC TESTS
- EEG
- LUMBER PUNCTURE
- CT SCAN
- MRI
- HEAVY METAL SCREEN
- B12, FOLATE
- HIV
- LE
- ANTINUCLEAR ANTIBODY.
TREATMENT AND MANAGEMENT

- Identify and reverse causes when possible

- Reduce psychiatric symptoms
  - with medications
  - environmental manipulations

PHARMACOLOGIC INTERVENTIONS

WHAT THE EVIDENCE SAYS

- First-line medications are typical or atypical antipsychotics.
- Begin with a single antipsychotic.
- Titrate dose to symptom response.
- Avoid benzodiazepines (except in alcohol or sedative-hypnotic withdrawal delirium)
- Avoid anticholinergics

TYPICAL ANTIPSYCHOTIC

HALOPERIDOL

- antipsychotic of choice
- safe, cost effective, and efficacious
- negligible or no anticholinergic activity
- lacks hypotensive properties
- Initial dose ranges from 0.5-10mg

RISKS

- Dose-related EPS
- Potential cardiac conduction alterations

ATYPICAL ANTIPSYCHOTICS

- Effective but not significant more so than Haloperidol
- Are an alternative to Haloperidol.
- Cardiovascular effects
  Tachycardia, hypotension and QTc interval prolongation
- Potential efficacy should be weighed against risk of adverse effects.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose Range</th>
<th>PO</th>
<th>IM</th>
<th>SL</th>
<th>Considerations for Use in Acute Agitation</th>
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<tr>
<td>Risperidone</td>
<td>0.5-10mg</td>
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<td>Lacks anticholinergic effects</td>
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<td>Dose related EPS</td>
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<td>Headache</td>
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<td>Olanzapine</td>
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<td>(Zyprexa, Zypren Zydis)</td>
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<td>Low EPS risk</td>
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<tr>
<td>Ziprasidone</td>
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<td>Minimal anticholinergic effects</td>
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<td>Activation (anxiety, agitation)</td>
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<td>Risk of QTc interval prolongation</td>
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<td>Sedation</td>
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<td>Risk of QTc interval prolongation</td>
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<td>Postural hypotension</td>
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OTHER ASPECTS OF TREATMENT
**FACILITATE REALITY**
- Encourage presence of family members
- Provide familiar clues (e.g., clock, calendar)
- Provide adequate lighting
- Provide sensory aids (e.g., hearing aids, glasses)
- Orient patient repetitively
- Minimize transfers
- Maximize staff continuity

**PREVENT AND MANAGE DISRUPTIVE BEHAVIORS**
- Place patient in a room near nursing station.
- Avoid placement in a room cluttered with equipment.
- Keep bed in low position and use rails
- Use restraints only if necessary
- Use sitter.

**MEDICAL CARE**
- Monitor vital signs, fluid input/output etc...
- Discontinue nonessential medications.
- Avoid addition of multiple medications.
- Avoid sleep interruption.
- Identify sources of pain.
- Regular laboratory evaluations as indicated

**COURSE (PROGNOSIS)**
- Course ranges from <1 week – 2 months
- Typical course usually 10-12 days.
- Full recovery in 4%-40% (Lipowski 1990)
- Increased risk of mortality (Francis and Kapoor 1992)

**COURSE (PROGNOSIS) - CNTD**
- Face future cognitive decline
- Use more hospital resources
- Have major postsurgical complications
- Experience poor functional recovery.
- Increased risk for nursing home placement.

**THANK YOU!**
- Questions?
- Contributions......
- References will be made available on request.