

# Delirium & Dementia Workshop

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# Goals

1. Differentiate Normal Cognitive Lapse, Mild Cognitive Impairment, Delirium, & Dementia.
2. Understand initial evaluation for Dementia
3. Understand initial evaluation for Delirium

# Case #1

- Mrs. M. is a 70 year old woman seen in ER with agitation
- **HPI**: 2 months ago, her daughter died unexpectedly, and she has been more depressed. One week ago, she became agitated and uncooperative.
- **PMHx**: thalamic CVA, bipolar illness, chronic pain, and osteoarthritis.
- **Meds**: tylenol with codeine, valproate, lithium, conjugated estrogens with progesterone, and aspirin.
- **Course**: She was seen in the ER, where labs and CXR were normal. A consulting psychiatrist recommended clonazepam.



# Case #1

- **Course (con't)**: Despite the clonazepam, she worsened, and became uncontrollable at home. She went back to the ER, where she had a fluctuating level of consciousness. CBC, renal panel, and CXR were normal. An EKG showed a LBBB (old) with slight ST changes from last EKG. Troponin level was 2.9. On further questioning, the patient admitted that she has some shortness of breath 5 days prior.
- **Questions:**
  - 1. How do you interpret her presentation?
  - 2. Is her mental status due to delirium or dementia? Why?



# Case #2

- Mr A. is a 67 yo male referred from another hospital for inpatient evaluation for “failure to respond” to therapy for depressive episode.
- **HPI**: 2 month history of depressed mood, sleeping difficulties, decreased interest in his usual activities, withdrawal from his family and friends, decreased appetite, and a 10 pound weight loss
- **PMHx**: HTN, ↑Lipids, no h/o MDD
- **Meds**: HCTZ, amlodipine, simvastatin; “medications for mood” were started at the referring facility, but tapered prior to transfer due to side effects and worsening depression



## Case #2

- **ROS** (per Mrs. A): memory has been “getting bad” for at least several years; began acting suspicious about the government as long as a year ago; urinary retention, constipation, orthostasis, and pseudoparkinsonism, all resolved off medications started at previous hospital
- **PE**: BP 190/110; appears sad and hopeless, difficult to engage in conversation, initially shows motor retardation, but later in the interview becomes agitated when discussing his condition; oriented except to day and month; unable to remember 3 items after 5 minutes; neurologic exam is positive for snout reflex and bilateral grasp reflexes; remainder of exam is normal



## Case #2

### ■ Questions:

- 1. What is your interpretation of Mr. A's presentation?
- 2. Delirium or dementia? Why?
- 3. Based on the side effect profiles, which medications do you think were started at the previous hospital? Hint: 2



# Mild Cognitive Impairment

- Memory complaint
- Objective memory impairment (1-2 SD <aged norms)
- No other general cognitive impairment
- Intact ADLs
- High risk → AD (10-15%/yr vs 1-2% controls, 3x risk AD by 5yrs)
  
- Not everybody → dementia
- No proven therapies



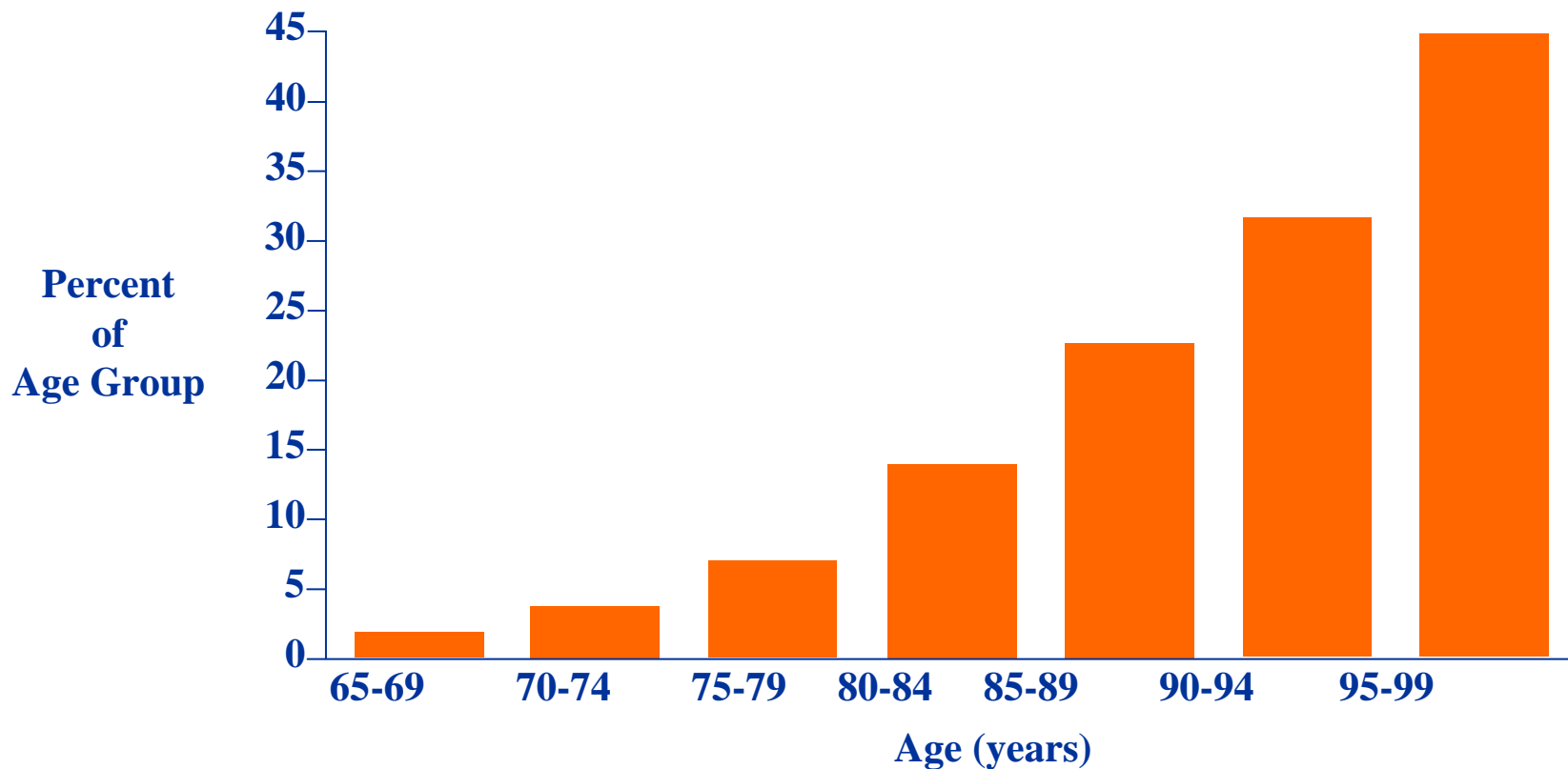
# Dementia

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# Dementia

- **Acquired** syndrome of **irreversible** significant decline in **memory** and other **cognitive functioning** sufficient to affect **daily living**
- Memory impairment present in earliest stages
  - **Gradual** onset with progressive decline in cognitive functioning
  - Motor and sensory functions are spared until late stages

# Prevalence of dementia is age dependent



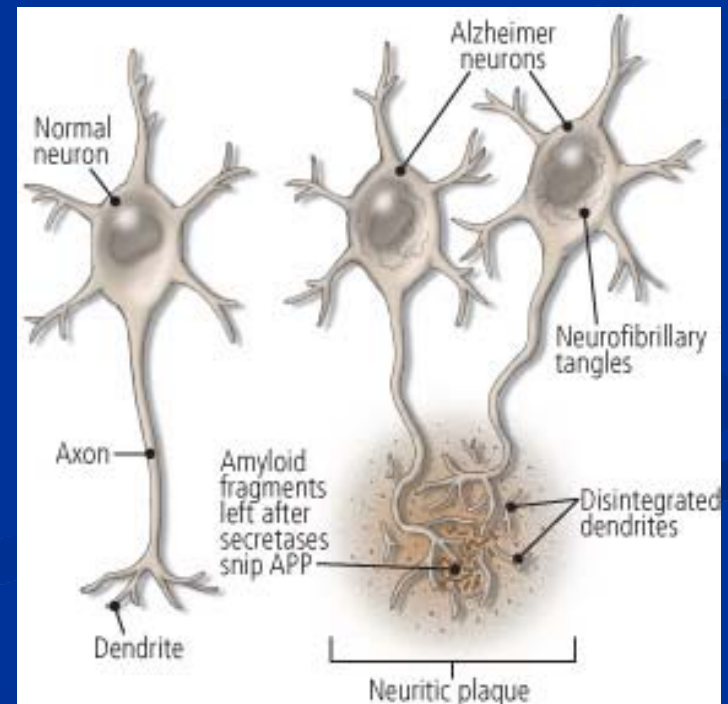
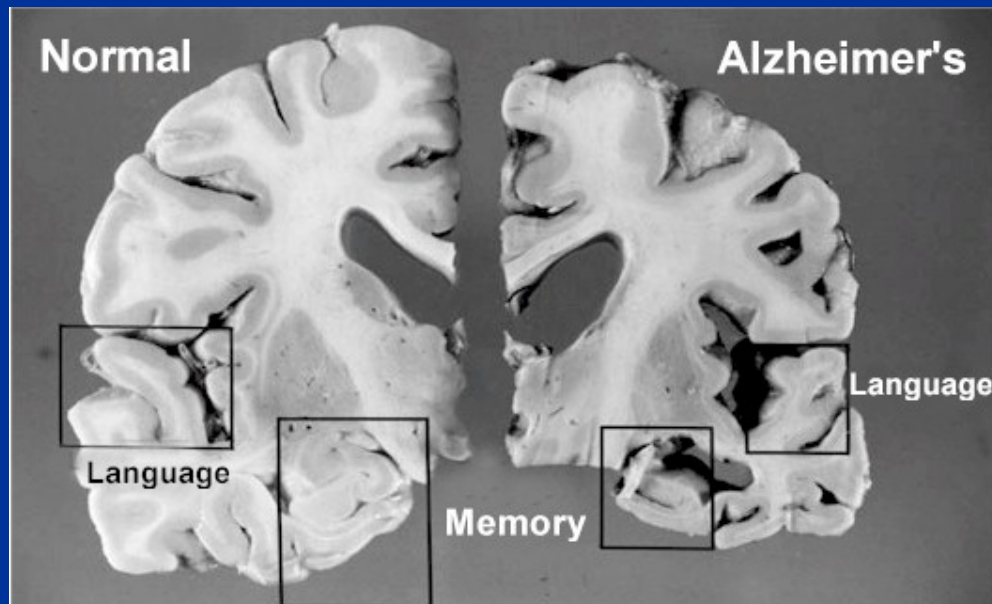
Adapted from Ritchie K, Kildea D. Is senile dementia "age-related" or "ageing-related"? evidence from meta-analysis of dementia prevalence in the oldest old. *Lancet*. 1995; 346:931-934.

# Is it dementia or normal cognitive lapses associated with age?

<b>Domain</b>	<b>Occasional Normal Lapses</b>	<b>Symptom of dementia</b>
<b>Memory</b>	Forgetting an acquaintance's name	Unexplained confusion in familiar settings
<b>Language</b>	Finding the right word	Forgetting simple words
<b>Performance of familiar tasks</b>	Leaving the kettle on the boil	Forgetting to serve a meal just prepared
<b>Judgment</b>	Choosing to wear a light sweater on a cold night	Wearing a bathrobe to the store
<b>Abstract thinking</b>	Having trouble balancing the checkbook	Not recognizing numbers, inability to do basic calculations
<b>Misplacing objects</b>	Losing car keys, glasses	Putting the iron in the freezer
<b>Personality</b>	Gradual change with age or circumstances	Sudden dramatic change e.g easy going to suspicious
<b>Mood and behavior</b>	Getting the blues in a sad situation	Rapid mood swings for no apparent reason

# Definitive Alzheimer's Dementia Diagnosis

- Requires autopsy
  - Generalized cerebral cortical atrophy
  - Widespread cortical neuritic (or senile) plaques
  - Neurofibrillary tangles



# Probable Alzheimer's Dementia: Diagnostic Criteria (DSM IV)

1. Multiple cognitive deficits: Memory impairment **plus**  $\geq 1$ 
  - i. aphasia : language disturbance
  - ii. apraxia : impaired ability to carry motor activities despite intact motor function
  - iii. agnosia : failure to recognize or identify objects despite intact sensory function
  - iv. executive functioning : planning, organizing, sequencing
2. Deficits  $\rightarrow$  significant functional impairment (ADL, IADL)
3. Not due to CNS disorders, delirium, or psychiatric illness

# Causes of Dementia

- Alzheimer's dementia (75%)
- Vascular dementia (15–25%)
- Other (memory deficit AND)
  - Dementia with Lewy Bodies
    - Fluctuating attention, extrapyramidal signs, psychosis (hallucinations)
  - Frontotemporal dementia
    - Speech/ language disorder, disinhibition, hyperorality
  - Huntington's Disease
    - Executive dysfunction, chorea
  - Creutzfeldt-Jakob Disease
    - Ataxia, myoclonus, language disturbance
  - Pseudodementia (toxic – metabolic disorders, Depression)

# Assessment of Dementia

- History
  - ADLs, falls, cardiac, volume, ETOH, meds
- Physical examination
  - Vitals
  - Neurologic
    - Gait (ex. Timed Get up & go)
    - Mental status evaluation
      - **Folstein's MMSE** (\*\*\*)
- Neuropsychological testing



# Dementia Laboratory and Imaging Recommendations

- CBC
- Serum B12
- TSH-reflex
- Comprehensive metabolic panel
  - Renal, Lytes, LFTs
- Structural imaging on initial evaluation
  - Functional imaging (PET) may be helpful if type of dementia uncertain
- Syphilis screening – if patients **is or was** high risk

# Dementia Imaging and Expected Findings

- **Structural (CT, MRI)**
  - Atrophy, Vascular disease, White matter disease
  - Could find space occupying lesion
- **Functional (PET)**
  - AD - parietal and temporal deficits
  - Vascular - focal, asymmetric, cortical, or subcortical
  - PD w/dementia - parietal
  - Depression - frontal or global

## Current therapies for Alzheimer's Dementia

- Acetylcholinesterase inhibitors (AChEI)
- FDA approved
  - Donepezil (Aricept)
  - Rivastigmine (Exelon)
  - Galantamine (Reminyl)
- **Delay** progressive cognitive decline
- **Delay** nursing home placement

# Current therapies for Alzheimer's Dementia

- NMDA (Memantine-N-methyl- D-aspartate) receptor antagonist
- Decrease over stimulation of the NMDA receptor by glutamate (implicated in neurodegenerative disorders)
- Approved by FDA for moderate to severe AD
- Recent study –
  - Memantine treatment in patients with moderate to severe Alzheimer's Disease *already* receiving Donepezil which resulted in *moderate improvement* in cognition and activities of daily living

# Additional Therapies

- Behavioral symptoms
  - Atypical antipsychotics are effective for psychosis in AD
    - Less side-effects than typicals
  - Antidepressants for depressive symptoms
    - depressed mood, appetite loss, insomnia, fatigue, irritability, agitation
    - SSRI preferred
    - Avoid anticholinergics (ex. tricyclic antidepressants)

# Case 1

- 70 year old woman seen in clinic for concern about 'memory'. She reports increasing difficulty remembering the names of people she used to work with when she bumps into them in town. Often walks into a room of her house and forgets what she was looking for. She even drove home from church once and when she pulled in to her driveway, she couldn't remember which road she had taken to get home.
- Mild Cognitive Impairment, Delirium, or Dementia?



## Case 2

67 yo female with history of HTN presents to your clinic with complaints of “memory loss”. Her family has noted a general decline in her hygiene. Although they report that she has been less available to them over the last several months, they also admit that her memory problems began a few years ago. She is widowed and lives alone.

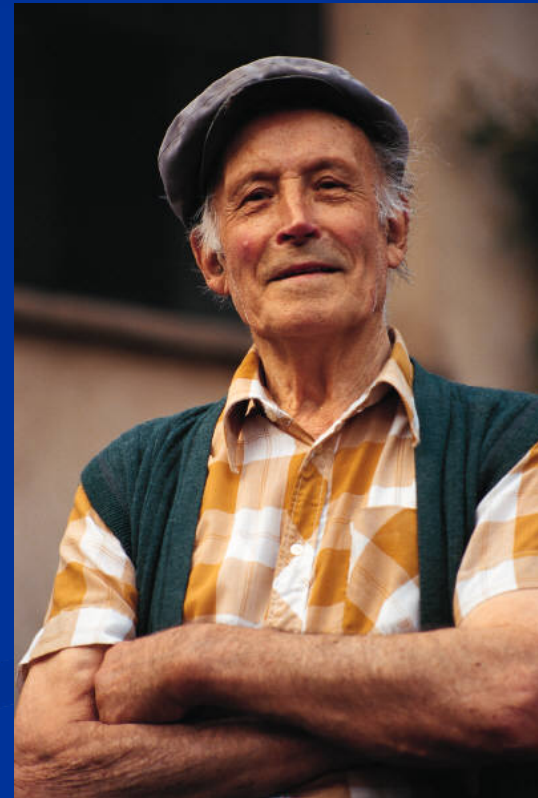
- Mild Cognitive Impairment, Delirium, or Dementia?



## Case 3

85 yo male with h/o HTN, dyslipidemia, DM presents to clinic in the presence of his son. He has had memory deficits over the 2 weeks which began acutely and have not improved. The son relates that until 2 weeks ago, his father had an excellent memory.

- Mild Cognitive Impairment, Delirium, or Dementia?





# Delirium

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# Delirium

- Latin, “off the track”
- Reported by Hippocrates
- 1 of most common psychiatric disorders in patients with medical illness
  - **especially in elderly patients**
- **Undetected** up to 84% of by medical team
- Potentially lethal if untreated



# DSM IV Diagnostic Criteria for Delirium

- Disturbance of **consciousness**
  - reduced ability to focus, sustain, or shift attention
- Cognitive change
  - memory deficit, disorientation, language disturbance or
- Development of perceptual disturbance
  - hallucinations, delusions, illusions
- Not accounted for by preexisting, established, evolving dementia
- Rapid onset – usually **hours to days**
- Evidence that delirium is the **direct physiological consequence** of a general medical condition, medication side effect, or substance intoxication or withdrawal

# Clinical Presentation – Disturbance of Consciousness

- **Earliest manifestations**
  - change in level of awareness and ability to focus, sustain, or shift attention
  - Often subtle
  - May precede more flagrant signs by one or more days
  - Distractibility – often evident in conversation
- **Symptoms are unstable**
  - Vary between morning and night
  - May miss the diagnosis if rely on single point assessment
- **Caregiver reports, patient “isn’t acting quite right” – should be taken seriously**
  - History from caregivers and family of baseline



# Diagnosis of Delirium

- Under-recognition, misdiagnosis – major problems
  - Physicians recognize <20% of cases of delirium
- Monitoring mental status critical to early diagnosis
- Perform brief cognitive testing (i.e. MMSE) as baseline
  - Formal mental status testing (MMSE) – more important than score is patient's overall attentiveness and accessibility while performing test, can use Confusion Assessment Method (CAM)

# The Mini-Mental State Exam

Patient \_\_\_\_\_ Examiner \_\_\_\_\_ Date \_\_\_\_\_

Maximum      Score

5      ( )

## Orientation

What is the (year) (season) (date) (day) (month)?

5      ( )

Where are we (state) (country) (town) (hospital) (floor)?

3      ( )

## Registration

Name 3 objects: 1 second to say each. Then ask the patient

all 3 after you have said them. Give 1 point for each correct answer.

Then repeat them until he/she learns all 3. Count trials and record.

Trials \_\_\_\_\_

5      ( )

## Attention and Calculation

Serial 7's. 1 point for each correct answer. Stop after 5 answers.

Alternatively spell "world" backward.

3      ( )

## Recall

Ask for the 3 objects repeated above. Give 1 point for each correct answer.

2      ( )

## Language

Name a pencil and watch.

1      ( )

Repeat the following "No ifs, ands, or buts"

3      ( )

Follow a 3-stage command:

"Take a paper in your hand, fold it in half, and put it on the floor."

1      ( )

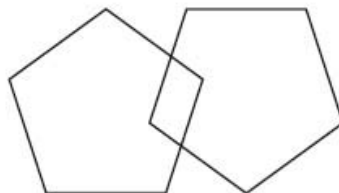
Read and obey the following: CLOSE YOUR EYES

1      ( )

Write a sentence.

1      ( )

Copy the design shown.



\_\_\_\_\_ Total Score

ASSESS level of consciousness along a continuum \_\_\_\_\_

Alert Drowsy Stupor Coma

# Bedside Tests of Attention

<b>Test</b>	<b>Directions</b>	<b>Scoring</b>
<b>Digit Span</b>	<b>Ask pt to listen carefully and repeat series of random numbers, read in normal voice, rate one digit per sec.</b>	<b>Inability to repeat a string of at least 5 digits – probable impairment</b>
<b>Vigilance “A” test</b>	<b>Read a list of 60 letters, among which the letter “A” appears at greater than random frequency, pt asked to indicate whenever target letter spoken</b>	<b>Count errors of omission and commission. More than 2 errors - abnormal</b>

# Confusion Assessment Method

Diagnosis of Delirium requires presence of features 1 and 2, AND either 3 OR 4

- 1 - Acute change in mental status and fluctuating course
- 2 - Inattention
- 3 - Disorganized thinking
- 4 - Altered level of consciousness



# Confusion Assessment Method

- Provides a brief, structured, validated, and standardized assessment of patient
- By using CAM – physicians achieve 94-100% sensitivity and 90-95% specificity in diagnosing delirium and high inter-rater reliability
- CAM requires less than 5 minutes to administer
- Standard screening device in clinical studies
- Modified version for ICU setting (behavioral observation and non-verbal communication)

# Delirium Classifications

- Psychomotor activity
  - Hyperactive (25%) agitation, increased psychomotor activity
  - Hypoactive (25%) decreased psychomotor activity
  - Mixed (35%) psychomotor activity w/ hyper- & hypo-active features
  - Normal (15%) psychomotor activity normal

# Pathophysiology of Delirium

- Exact unknown, several hypotheses
  - cortical mechanisms, subcortical mechanisms, alterations in neurotransmitters and cytokines
- Multiple etiologies
  - Likely multiple pathways for disease
  - Unlikely single mechanism is the cause

# Delirium Risk Factors

## Predisposing Factors

- Advanced age
- Dementia
- Parkinson's disease
- Functional/physical impairment in ADLs
- High medical co-morbidity
- History of alcohol abuse
- Male Gender
- Sensory Impairment (hearing or vision)
- History of CVA
- History of Delirium

## Precipitating Factors

- Medications
- Drug/Medication withdrawal
- Infections
- Immobility/restraint use
- Dehydration/Malnutrition
- Electrolyte disturbances
- Anemia
- Uncontrolled pain
- Urinary retention
- Fecal impaction
- Sleep disturbances
- Environmental changes
- Intracranial events
- Acute cardiac or pulmonary events

# Differential Diagnosis of Delirium

- Dementia
  - 22-89% of patients with delirium have dementia, but can't diagnose dementia when delirious
- Depression
- Acute psychiatric syndromes/psychosis
  - **All can co-exist with acute delirious states**
- ❖ When in doubt: think delirium (as can be reversible), rule out common medical etiologies

# Differentiating Delirium from Dementia

<b>Feature</b>	<b>Delirium</b>	<b>Dementia</b>
<b>Onset</b>	<b>Acute</b>	<b>Insidious</b>
<b>Course</b>	<b>Fluctuating</b>	<b>Progressive</b>
<b>Duration</b>	<b>Hours to months</b>	<b>Months to years</b>
<b>Consciousness</b>	<b>Reduced</b>	<b>Clear</b>
<b>Attention</b>	<b>Impaired</b>	<b>Normal - early stages</b>
<b>Orientation</b>	<b>Impaired</b>	<b>Impaired</b>
<b>Memory</b>	<b>Impaired</b>	<b>Impaired</b>
<b>Thinking</b>	<b>Disorganized</b>	<b>Impoverished</b>
<b>Perception (ex. hallucinations)</b>	<b>Present</b>	<b>Often absent early</b>
<b>Speech</b>	<b>Incoherent</b>	<b>Word finding difficulty</b>

# Etiologies of Delirium

- Usually multifactorial etiology
  - Therefore, solving one factor may not resolve the delirium
- Results from interrelationship of precipitating factors Superimposed on a susceptible host (predisposing conditions)
- Delirium may be the **ONLY** finding suggesting acute illness in older demented patients

# Etiologies – Medications, Drugs

- Anticholinergics
- Sedative hypnotics (benzodiazepines)
- Narcotics (opioid analgesics – esp. Demerol)
- Parkinson's agents (ie. Levodopa-carbidopa, dopamine agonists, amantadine)
- H2 blocking agents
- Antipsychotics (ie. Clozapine)
- Lithium
- Antidepressants (ie. TCAs)
- Antibiotics
- Anticonvulsants (ie. Phenytoin)
- Alcohol
- Barbiturates
- Digoxin
- Centrally acting antihypertensive agents (ie. Methyldopa, reserpine)
- Corticosteroids
- Antiemetics
- OTC agents (ie. Benadryl, herbal medications)



# Delirium Etiologies Continued

## ■ Infections

- respiratory, urinary, CNS infections, skin and soft tissue infections, joint and bone infections, HIV, post-operative infections, sepsis

## ■ Metabolic disturbance

- electrolyte imbalances, dehydration, hypo- or hyperglycemia, end organ failure (ie. hepatic or renal), hypoxia, acid-base disturbance, endocrine disorders

## ■ Cardiovascular/Hypo-perfusion states

- CHF, MI, cardiogenic shock, arrhythmia, anemia

## ■ Pulmonary

- hypoxemia, asthma or COPD exacerbation, pulmonary embolus, pneumonia

## ■ Neurologic

- Head trauma, cerebral hemorrhage, TIA/CVA, CNS tumor or infection, seizure, encephalopathy

## ■ Other

- malnutrition, fecal impaction, urinary retention, sleep deprivation, stress, post-operative state, pain, medication/drug/alcohol withdrawal, poisoning/toxic causes, over-stimulation (ie ICU or unfamiliar environment)

# Delirium Diagnostic Evaluation

- Comprehensive history
  - Cognitive impairment, perceptual problems, time course, associated symptoms, medications, substance abuse
- Physical and psychiatric assessment
  - Vital signs including O2 sats
- Functional status – present compared to baseline?
- Bedside assessment techniques for memory and attention
  - MMSE, CAM, Digit Span, days of the week backwards, vigilance “a” test
- History, PE, and work-up – has 80% diagnostic yield, if done appropriately

# Delirium Diagnostic Tests

- Targeted based on history and physical exam
  - CBC with diff
  - Comprehensive chemistries
  - UA/UCx (not reflex)
  - TSH- reflex
  - B12 levels
  - Drug levels
    - Serum: digoxin, theophylline, phenytoin, valproate, EtOH
    - Urine: drugs of abuse screen, methadone requested separately
  - LP with CSF analysis – consider if CNS infection is suspected
  - CXR – if pulmonary etiology suspected
  - Cerebral imaging – head trauma or focal neurological findings
  - EEG – in cases of suspected seizure activity

# Delirium Management

## Key steps in management of delirium

- Identify and treat underlying medical illness/etiology
- Manage behavioral problems
- Avoidance of factors known to cause or aggravate delirium
- Avoid complications of delirium
- Provide supportive, restorative, and rehabilitative care for patient
- Counsel, support, and educate the patient and family

# Delirium Management – Non-pharmacologic

- Provide quiet, well-lit room for patient
- Avoid excessive noise, stimulation
- Encourage familiar faces (family, caregivers) for reassurance
- Provide orientation
- Correct sensory impairment(s)
- Communicate in a succinct, direct style
- Attentive nursing care, observation
- Discontinue non-essential medications
- Avoid restraints (physical, pharmacological, urinary catheters, IVs)
- Geriatric medicine consultation



# Delirium Management - Pharmacologic

- Direct specific medical treatment to underlying medical condition
- Pharmacologic management of behavioral problems – most challenging aspect of delirium therapy
- Reserve medications for acute agitation or aggression, delusions, hallucinations, drug or alcohol withdrawal – when patient presents a harm to self or others
- Avoid medications for behavioral problems if at all possible because most medications can make the delirium worse
- No FDA approved medication to treat delirium

# Pharmacologic Management of Behavioral Problems

## Antipsychotic agents

- First line medication
- Cautious trial at low initial dose
- If subsequent dosing increases necessary, make changes gradual and incremental
- Document and assess target symptoms and response to treatment (necessary)
- Discontinue medications as soon
- Frequent re-assessment



# Pharmacologic agents

- Haldol – use low dose – 0.25–0.50 mg po or 0.125–0.25 mg IV/IM with careful reassessment of patient prior to additional dosing
- Potential side effects – hypotension, sedation, akathisia (motor restlessness), anticholinergic effects, and extrapyramidal effects
- Atypical antipsychotics – risperidone, olanzapine, quetiapine – fewer side effects with similar efficacy
- Benzodiazepines – reserve for alcohol and BDZ withdrawal delirium



# Pain and Delirium

- Pain and delirium have a close relationship – often unrecognized
- Prospective study – higher pain scores on second post-operative day associated with increased incidence of delirium
- Opioids – have low risk for producing delirium with exception of Demerol, therefore, physicians should not hesitate to provide adequate doses to patients with significant pain

# Prognosis

- Delirium is associated with poor patient outcomes
- Increased mortality 2x increase
  - 1 and 6 month mortality to be 14% and 22%, respectively
  - 3x risk of death after controlling for pre-existing comorbidities, severity of illness, use of sedatives/analgesics
- In hospital fatality rates 25-33%
  - comparable to MI, sepsis

# Consequences of Delirium

- Prolonged hospital stay
  - 3-5x risk of nosocomial complications
  - Increased health care expenditures
- Poor recovery post-discharge
  - Increased need for post-acute nursing home placement
  - Increased risk of death up to 2yrs after discharge
- Symptoms persist weeks – months
  - $\geq 6$  months in 80% of patients
- Caregiver burden

# Treatment Challenges

- Under-treatment of delirium – common problem
- Estimated 96% of patients with delirium were discharged from the hospital with unresolved symptoms
  - In 20% of these cases, symptoms resolved within 6 months of discharge
  - Suggests prevalence of delirium in community and post-acute settings is higher than expected
  - Recommend PCPs and LTC physicians evaluating geriatric patients screen for delirium

# Patient and Family Education

- Educate family, caregivers, and patient regarding etiology and **course** of disease
  - signs/symptoms and risk factors for delirium
  - Sudden changes in mental function NOT expected with progressive dementia
  - Requires prompt medical attention
- Realistic evaluation of caregiver resources since weeks to months and may not reach previous baseline
  - May require sub-acute rehabilitative environment until delirium resolves

# Case Study

- 82 yo white male PMH mild dementia, HTN, BPH
- Admitted to hospital s/p MVC on Trauma Service – wife and dog killed in collision
- Acute injuries – multiple rib fractures, right hip fracture, right sided pneumothorax s/p chest tube
- Surgical intervention – right hemiarthroplasty hospital day 2
- Post-op analgesia – Morphine PCA, Percocet prn
- HD #3 – pt became confused, agitated, combative and resistant to care

# Case Study cont.

- Psychiatry consulted – MMSE 23/30; diagnosis – delirium – prescribed – Seroquel 50mg QAM, 25mg Qnoon, 50mg QHS; 4 point physical restraints
- Pt became somnolent - poor po intake/nutrition led to NG tube placement; immobility led to functional decline and sacral ulcers
- Primary team was recommending PEG placement to patient's family
- HD #9 – Geriatrics consultation – found the patient very somnolent, mental status/LOC waxed and waned, confused, inattentive – diagnosis of acute delirium – multifactorial – medications, acute illness, constipation (post-op ileus), restraints, malnutrition

# Case Study cont.

- Geriatrics recommendations – taper and d/c Seroquel, remove restraints, one-on-one sitter and family support; re-orientation, treat constipation, nutrition, PT – mobilize once more alert; avoid PEG placement
- Primary team reluctant to decrease or d/c Seroquel as prescribed by psychiatry but they had not revisited the patient
- Once Seroquel and restraints were discontinued – patient became more alert, attentive, less confused – oriented to situation and place – able to sit up, participate in therapy, tolerate po and removal of NG tube – within days – ready to d/c to rehabilitation