

# Human Behavior Course 2004

## Delirium

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# HUMAN BEHAVIOR COURSE 2004

## DELIRIUM - SLIDES

### LEARNING OBJECTIVES AND STUDY QUESTIONS FOR DISCUSSION.

1. Know the meaning of the terms and concepts listed in slide one below.
2. Name the key defining characteristics of delirium.
3. Contrast delirium and dementia.
4. Why is delirium a medical emergency?
5. List the emergent causes of delirium and describe the clinical history, examination, and tests necessary to investigate them.
6. Name the main risk factors for delirium.
7. Describe the central psychosocial management principles for delirium.
8. Describe the role of medications in the management of delirium.
9. What medications exacerbate or cause delirium?
10. What medical problems exacerbate or cause delirium?

Slide 1

### Delirium - Terms & Concepts

- ★ Clinical syndrome versus pathology
- ★ Delirium versus dementia
- ★ Level of consciousness
- ★ ICU psychosis
- ★ Sundowning
- ★ Predisposing (risk) factors
- ★ Asterixis
- ★ Anticholinergic effects
- ★ Deliriogenic medications
- ★ Benzodiazepines
- ★ Antipsychotic agents
- ★ Neuroimaging
- ★ Lumbar puncture
- ★ Electroencephalogram
- ★ Mini-mental status examination



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## Delirium: Confused State The Syndrome & The Nomenclature

acute brain failure	infective-exhaustive psychosis
acute brain syndrome	ICU psychosis
acute confusional state	metabolic encephalopathy
acute organic psychosis	oneiric state
acute organic reaction	organic brain syndrome
acute organic syndrome	reversible cerebral dysfunction
acute reversible psychosis	reversible cognitive dysfunction
acute secondary psychosis	reversible dementia
cerebral insufficiency	reversible toxic psychosis
confusional state	toxic confusion state
dysergastic reaction	toxic encephalopathy
exogenous psychosis	beclouded states



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adapted from Hales & Yudofsky, Textbook of Neuropsychiatry, AP Press, 1987

## Delirium Diagnostic Criteria

- ★ Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) with reduced ability to focus, sustain, or shift attention.
- ★ Change in cognition (i.e., memory deficit, disorientation, language disturbance, perceptual disturbance) that is not better accounted for by a dementia.
- ★ Develops over a short period (usually hours or days) & tends to fluctuate during the course of the day.
- ★ Clinical finding of a etiologically related general medical condition.



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<b>Delirium</b>	<b>Dementia</b>
<i>Clouding of consciousness</i>	Loss of memory/intellectual ability
<i>Acute onset</i>	<i>Insidious onset</i>
Lasts 3 days to 2 weeks	Lasts months to years
Orientation impaired	Orientation often impaired
Immediate/recent memory impaired	Recent and remote memory impaired
Visual hallucinations common	Hallucinations less common
Symptoms fluctuate, often worse at night	Symptoms stable throughout day
Usually reversible	15% reversible
Awareness reduced	Awareness clear
EEG changes (fast waves or generalized slowing)	No EEG changes

## Delirium Epidemiology

- ★ 10-15% patients in general hospital settings
- ★ Risk factors:
  - Elderly patients (60+ y/o)
  - Post-cardiotomy patients
  - Patients with severe burns
  - Patients with brain pathology/cognitive dysfunction
  - Patients in acute substance withdrawal
  - Patients with HIV-spectrum disease
  - Patients with multiple, severe, or unstable medical problems



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## Delirium Pathophysiology

- ★ Electroencephalographic changes --
  - Global slowing (hypoactive delirium)
  - Low-voltage fast activity (hyperactive delirium of alcohol withdrawal delirium)
- ★ Neurochemistry --
  - GABA
  - Anticholinergic agents
- ★ Systemic vs. focal --  
Cortex & subcortical white matter (Right MCA)



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## Delirium Clinical Features

- ★ Prodrome & rapid onset
- ★ Fluctuating course
- ★ Attention deficits
- ★ Arousal disturbance & psychomotor abnormalities
- ★ Disturbance of sleep-wake cycle
- ★ Impaired memory
- ★ Disorganized thinking & impaired speech
- ★ Disorientation
- ★ Neurological abnormalities
- ★ Emotional disturbance



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**Table 5-5. "I WATCH DEATH" Mnemonic for Delirium**

<i>Infectious</i>	Sepsis, encephalitis, meningitis, syphilis, urinary tract infection, pneumonia
<i>Withdrawal</i>	Alcohol, barbiturates, sedative-hypnotics
<i>Acute metabolic</i>	Acidosis, electrolyte disturbance, hepatic and renal failure, other metabolic disturbances (Glc, Mg, Ca)
<i>Trauma</i>	Head trauma, burns
<i>CNS disease</i>	Hemorrhage, CVA, vasculitis, seizures, tumor
<i>Hypoxia</i>	Acute hypoxia, chronic lung disease, hypotension
<i>Deficiencies</i>	B <sub>12</sub> , hypovitaminosis, niacin, thiamin
<i>Environmental</i>	Hypothermia, hyperthermia, endocrinopathies (diabetes, adrenal, thyroid)
<i>Acute vascular</i>	Hypertensive emergency, subarachnoid hemorrhage, sagittal vein thrombosis
<i>Toxins/drugs</i>	Medications, street drugs, alcohol, pesticides, industrial poisons (carbon monoxide, cyanide, solvents, etc.)
<i>Heavy metals</i>	Lead, mercury

*Source:* Adapted with permission from Wise MG, Gray KF, Seltzer B: "Delirium, Dementia, and Amnesic Disorders." *American Psychiatric Press Textbook of Psychiatry*, third edition. Washington, DC, American Psychiatric Press, 1999.

**Table 5-6. Potentially Deliriogenic Medications (a Partial List)**

Antimicrobials (especially penicillins, cephalosporins, quinolones)	Barbiturates
Antiarrhythmics	Benzodiazepines
Anticholinergics (and psychotropic medications with anticholinergic properties)	Corticosteroids
Anticonvulsants	Gastrointestinal agents
Antihistamines (including H <sub>2</sub> -blockers in antacids and H <sub>1</sub> -blockers in allergy and sleep aids)	Immunosuppressive agents
Antihypertensive agents (including $\beta$ -blockers, clonidine)	Lithium
Antineoplastic agents	Muscle relaxants
Antiparkinsonian agents (both anticholinergic and dopaminergic)	Opiates
Antituberculous agents	Salicylates
	Sympathomimetic agents (including amphetamines, phenylpropanolamine)
	Theophylline

**Table 5-7. Anticholinergic Drug Levels for 25 Medications (in ng/mL of Atropine Equivalents), Ranked by the Frequency of Their Prescription to Elderly Patients**

1. Furosemide	0.22
2. Digoxin	0.25
3. Dyazide	0.08
4. Lanoxin	0.25
5. Hydrochlorothiazide	0.00
6. Propranolol	0.00
7. Salicylic acid	0.00
8. Dipyridamole	0.11
9. Theophylline	0.44
10. Nitroglycerin	0.00
11. Insulin	0.00
12. Warfarin	0.12
13. Prednisolone	0.55
14. $\alpha$ -methyl dopa	0.00
15. Nifedipine	0.22
16. Isosorbide dinitrate	0.15
17. Ibuprofen	0.00
18. Codeine	0.11
19. Cimetidine	0.86
20. Diltiazem hydrochloride	0.00
21. Captopril	0.02
22. Atenolol	0.00
23. Metoprolol	0.00
24. Timolol	0.00
25. Ranitidine	0.22

*Source:* Adapted with permission from Tune L et al: "Anticholinergic Effects of Drugs Commonly Prescribed for the Elderly: Potential Means for Assessing Risk of Delirium." *Am J Psychiatry* 149:1393-1394, 1992.

## Delirium Clinical Assessment

- ★ Goal: Identify reversible causes of delirium.
- ★ Approach:
  - Mental status examination.
  - Physical examination.
  - Laboratory evaluation.



<b>1. Orientation</b>	
What is the date, month, year?	5 points
Where are we (state, city, hospital)?	5 points
<b>2. Registration</b>	
Name three objects and repeat them.	3 points
<b>3. Attention and calculation</b>	
Serial 7s (subtract 7 from 100 and continue subtracting 7 from each answer) or spell "world" backward.	5 points
<b>4. Recall</b>	
Name the three objects above 5 minutes later.	3 points
<b>5. Language</b>	
Name a pen and a clock.	2 points
Say, "No ifs, ands, or buts."	1 point
Three-step command: Take a pencil in your right hand, put in your left hand, then put it on the floor.	3 points
<b>6. Read and obey the following:</b>	
Close your eyes.	1 point
Write a sentence.	1 point
Copy design.	1 point
<b>TOTAL</b>	<b>30 points</b>

## Delirium

### Medical Management

Manage as a medical emergency

Treat the underlying problem(s)



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## Delirium

### Emergency Differential Diagnosis

- ★ Wernicke's encephalopathy or Withdrawal
- ★ Hypertensive encephalopathy
- ★ Hypoglycemia
- ★ Hypoperfusion of CNS
- ★ Hypoxemia
- ★ Intracranial bleeding/infection/mass
- ★ Meningitis or encephalitis
- ★ Poisons or medications or metabolic disturbance



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## Delirium - Clinical Assessment

### Basic Laboratory Evaluation

- ★ blood chemistries:  
electrolytes, glucose, BUN & creatinine, LFTs, ammonia,  
albumin, sedimentation rate
- ★ complete blood count with differential
- ★ urine drug screen
- ★ arterial blood gas.
- ★ urinalysis.
- ★ electrocardiograph.
- ★ chest x-ray.



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## Delirium - Clinical Assessment Additional Laboratory Evaluation

- ★ blood chemistries:  
heavy metal screen; thiamine & folate assays; thyroid panel; antinuclear antibodies
- ★ HIV & VDRL
- ★ urine & blood cultures & sensitivities
- ★ serum levels of medications
- ★ urinary porphobilinogen
- ★ CT scan or MRI
- ★ lumbar puncture
- ★ EEG



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## Delirium Clinical Outcomes

- ★ Most patients fully recover.
- ★ Some patients develop chronic brain syndromes.
- ★ Some patients die (see below).



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# Delirium Prognosis

## ★ Morbidity.

- Delayed recovery & prolonged length of stay.
- Higher rate of complications.
- Persistent functional impairment.

## ★ Mortality.

- 25% die within 6 months.



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## **Recommendations for management of delirium**

In the hospital, a quiet, restful setting that is well lighted is best for the confused patient.

1. Consistency of personnel is less likely to upset the delirious patient.
2. Reminders of day, date, time, place, and situation should be prominently displayed in the patient's room.
3. Medication for behavioral management should be limited to those cases in which behavioral interventions have failed.
  - Only essential drugs should be prescribed, and polypharmacy should be avoided.
  - Sedative-hypnotics and anxiolytics should be avoided.
  - Unmanageable behavior also may require low-dose neuroleptics or, alternatively, benzodiazepines with short half-lives (e.g., lorazepam, 0.5 mg twice daily).

# Delirium Psychopharmacologic Treatment

## Benzodiazepines

only first-line for CNS depressant  
withdrawal delirium



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