Behind The Many Changing Faces of Altered Mental Status

It is the purpose of this article to demonstrate the Likelihood both of any hospitalized or cognitively impaired patient presenting with the different faces of CD(D)DC syndrome and the traditional troubles in recognizing them. So much of this High Risk Neuropsychiatric Medicine is associated with aging that Medical Negligence has been somewhat underrated as potential malpractice. The lifetime incidence of CD(D)DC approaches 100%, but clinicians must judge when either definitive or palliative care is indicated. I demonstrate the likelihood of past error in diagnosing patients with mental disorganization and/or cognitive impairment. How often do we see patients in nursing homes who had been hospitalized in the old state hospitals for "Psychosis". The first line, Identifying Information, usually starts, "this 75 year old Schizophrenic male". Such identifying information should be like a trumpet blast for counterintuitive Epidemiologically-informed Clinical decision-making. The best clinician cannot pick up all sporadic diseases masquerading as confusion, delirium, depression or apparent dementia. But, either in the hospital and nursing home - or in any encounter with AMS - the trumpets should always blare to stop fatal medical errors of premature diagnostic closure. Teamwork, with consensus obedience to classical rules of Triage, therefore, is essential to support adequate workup and system learning for common, under-diagnosed, treatable and debilitating syndromes.

A Case Study

"Ben was admitted to Psychiatry at Northern Hospital at 5:00 AM on Saturday morning, 9/11/04. He had been brought to the Northern ER by the Police who found him wandering in a severely agitated state. They suspected intoxication. His neck had been previously immobilized within a Halo at Southern Hospital, but Southern rejected his admission because all its beds were full."

(***Image 1. Go to yellow screen,***
Image 2 click "BIB Police",
and then go to
Image 3 "Orange Screen
and click
Image 4 "Psychosis" without any stops in between.)

The inpatient psychiatric admitting nurse discovered that Ben was under the care of a Neurosurgeon at a neighboring, but unaffiliated, hospital, for cervical disk disease. She assumed that he was likely awaiting surgical intervention at Southern Hospital. Inpatient Psychiatry is both staffed and structured for ambulatory patients. Shortly after admission, the patient staggered down a hallway, hit the wall and displaced his halo. Neurosurgery at Northern Hospital refused to see the patient, because he was under the care of associates in a neighboring and unaffiliated hospital. When the patient's Neurosurgeon at Southern Hospital was located by the admitting psychiatrist three hours after admission, he was infuriated by the admission and requested that the patient be transferred to his ER at Southern Hospital. Medic One had to be called to the Inpatient Psychiatric Unit to

prevent imminent quadriplegia,. The patient was safely immobilized and transferred to neighboring Southern, where he was admitted to Surgery . An incident report was filed by the attending Psychiatrist and inpatient psychiatric nursing staff at Northern, but there was never any response from either the Medical Director or Administration. As the Director of Emergency Medicine put it the following day,"just the game that has to be played these days".

With our Emergency Healthcare System trapped by converging demands of escalating outpatient services for non-emergent patients, punitive threats for EMTALA violations, the recent loss of 25% of our ERs, along with 100,000 fewer acute care beds to back up the surviving ERs, all too often, these cases do appear to be a game – the childhood one of hot potato. The Department of Emergency Medicine's liability, both under EMTALA and medical negligence, was covered once the admitting Psychiatrist had been coerced into accepting the patient. Because hospitals are reimbursed for patient care based on Diagnostic Related Groups, administration requires efficient Thruput to keep patients moving in, then "through" and, finally, out of the hospital for economic reasons. Oftentimes such efficient "Thruput" pushing inpatient flow is euphemistically labeled Lean Management, The Toyota Way. But, in this case, it was really the antithesis of authentic lean management the Toyota way. No responsible parties observing could stop the assemblyline from ER to Psych. The system made no effort to learn from the error and take corrective action, and everyone involved and responsible flew blind without being able to see what they needed to see – i.e. The Pharmacy never knew what medications Ben was on. The psychiatric charge nurse and admitting psychiatrist had been led to believe that Ben had been medically cleared in the ER for safe treatment of his primary acute psychiatric disorder on the inpatient psychiatry unit.

Neither Ben nor his family may ever know how close he came to becoming a fatal medical error – or at least close to it as quadriplegic and chronically brain damaged. Assuming no law suit for medical negligence at Northern Hospital or fines for EMTALA violations at Southern's ER for dumping Ben on another hospital's ER, only the Emergency Rooms at Northern and Southern could possibly have come close to breaking even financially in his case. The etiology of Ben's confusion and agitation was not established within at least the first 8 hours following admission – if ever.

Too infrequently, physicians requesting transfer of patients to Inpatient Psychiatry for either definitive treatment, ***Observation of Suspected Mental Condition*** or ***Psychiatric Consultation*** do not recognize that the patient's confusion has a medical-surgical causation. Or, if they do, they think that it is best to work up the confused and agitated patient on by a Psychiatrist on the inpatient psychiatric unit. The obvious jeopardy created by this type of medical decision-making is only one element of the failure here. Any frontline physician should be able to determine causation and manage an acute organic brain syndrome, a med/surg disease first and only a Psychiatric Disorder when Psychiatric Consultation is medically necessary – probably uncommonly the case.

In most cases of organicity, no harm is done via a diagnostic process of exclusion for Pseudodementia. And, once validated as a diagnosis, that pseudodemented patient should

become a primary Psychiatric inpatient with medical consultation, a Consultation-liaison Psychosomatic case on a med/surg unit or a Psychiatric outpatient.

On busy nights in the ER, like that of 9/11/04 at Northern, driving 9 back-to-back inpatient psyche admissions, it is still medically negligent to simply clear "Emergency" by winging it with emergency psych admission. Such seat-of-the pants take-off is for very, very experienced pilots only. The rest of us must check the instrument panel before takeoff and follow the evidence-based rules of the Time-determined rules of Classical Triage.

BiB Police should instead immediately put you in the Red Zone of Clinical State of Awareness so that you can clear the ABCDE of Emergency Medical Triage:

(Best Practices in Emergency Medicine require that the ***Image 5.Yellow Zone State of Clinical Awareness, when confronted by Image 6, an ER admission by the Police, should go to the Image 7 Red Zone, rather than Northern ER's leap of faith to the Orange Zone's diagnosis of "Psychosis".***

Ben was mentally disorganized, but there was insufficient evidence of psychosis to break the Evidence Based Rules of Triage in order to efficiently clear the ER for Thruput, avoid threat of EMTALA violation by transferring patient back to Southern or transfer medical liability to the doctors and nurses on Inpatient Psychiatry.

And, in clearing the ***Image 7 ABCDE's of Emergency Medicine in the Red Zone***, the obvious spinal ***Image 8. Disability*** required immediate intervention, rather than an expedient internal dump on to Inpatient Psychiatry.

Once you save the patient – in this case, prevention of irreversible cervical spinal injury or even death – clinical staff must save itself by:

Image 9. "Throwing Out the GUNS". This clears imminent physical security threat. The "GUNS" is a mnemonic for immediate point-of-entry security clearance and stands for:

Image 10 **G** = Does Ben have a **Weapon?** One can assume that the police frisked Ben before transport. But, a halo can be a weapon if displaced in an aggressive patient who is potentially Dangerous to Self and or Others?

Image 11 **U** = User of Drugs with Intent to Get Them from You: The Police suspected drugs. Rule it out before proceeding, and if he's using, get security.

Image 12 **User Screen, Click Not Confirmed**

Image 13 **N** = Need Protection from Gang – Is he Paranoid or Arrogantly aloof and concealing? Not the case

Image 14 **S** = Situation of danger outside point-of-care. Not apparently the case here. Still need to check it out, because you don't know why an unknown patient is behaving in a peculiar fashion, particularly if paranoid. Always ask the question, is it to avoid getting harmed outside the hospital by someone threatening? Spouse? Paramoor? Rival Gang?

Assuming that the first clinical encounter is in the admitting ER and both Medical Emergencies (**The D**) and Imminent Dangerousness to Self and Others **(The GUNS)** had been ruled out, what then could have been done for Ben, an unknown patient in his First Clinical Encounter?

Etiology, more than DSM Psychiatric diagnosis, is the first priority for the attending ER physician, regardless of specialty and regardless of whether patient is psychotic or not. Before that could be done, however, the clinical site had to be secured to assure neither harm to self nor harm to others.

Image 15. **A**gitation
Combativeness
Threatening

Agitation is a broad, behavioral presentation, oftentimes including irritability and anger. There is usually associated motor movements, such as pacing. Agitation States are best identified and calibrated for severity by application of the positive numbers from The Richmond Agitation-Sedation Scale (RASS) as follow:

4. Combative
3. Very Agitated
2. Agitated
1. Restless or Mild Agitation
0. Alert and Calm

The importance of this specificity is to assure discrimination of this abnormality of Psychomotor Activity from Anxiety, "a vague, uneasy feeling, the source of which often is non-specific or unknown to the person experiencing it". Also it must be distinquished from neurological motor abnormalities such as Akithisia, Athetosis and Chorea.

Ben was severely agitated, and he did not respond to either verbal limits

Image 16 Verbal Threats

and nonverbal limit setting

Image 17 Non verbal Threats.

Medical restraint would inevitably be necessary for both protection of the patient and staff working within his intimate space. The FDA has not approved any drug for the treatment of Agitation within the Neuropsychiatric clinical spectrum of Coma/Delirium/Dementia/Confusion. In an Expert Consensus Guidelines/Survey of 56 Medical Directors of Psychiatric Emergency Service facilities, 60% prefer Benzodiazepine monotherapy for the agitated, uncooperative patient **with** medical history and **no** prior exposure to antipsychotics. The Royal College of General Practitioners' summary of guidance for management of Behavioral and psychiatric symptoms in dementia and treatment of psychosis in people with history of stroke or transient ischemic accident, however, disagrees. The "Majority view was that the newer antipsychotics are likely to have a favorable side-effect profile compared to traditional antipsychotics."

Although this may appear too ambiguous, similar ambiguity currently informs emergency restraint in general. Federal Medicare Regulations favor medical restraint, while JCAH guidelines frequently contradict them within the same institution, deferring medical restraint to a last resort. I believe that most Emergency Medicine specialists consider physical restraint as an absolute last resort in the most intractable cases of Agitation. It is estimated that Physical Restraint is used in less than 10% of cases, because restrained patients can be seriously injured in an agitated state. Emergency Medicine directors generally believe that the risk of elopement and staff/patient injury are also too high to warrant Seclusion anymore in the management of Agitation.

The JCAH requires that every house supervisor has immediate access to the institution's policies and procedures for restraint. This enables clinical staff to effectively function within the ambiguities of both physical vs medical restraint. It also facilitates choice of first-line psychotropics within the broadening spectrum of medical restraint options. Whatever one does, it is necessary to document both the intention and justification for any emergency restraint intervention, whenever the patient is determined to be mentally incompetent for informed consent. For example, "in order to protect the patient and staff from injury (***intent)***, I elected (***justification***) to use IM Haldol with Cogentin and Ativan to obtain rapid clearance of severe agitation most likely caused by metabolic disturbance. Physical restraint would have required excessive show of force, and security was not immediately available in the event of seclusion."

The Emergency Department, however, is far less restricted by contradictory regulation than is a Med/Surg Unit. And, once the patient is a psychiatric inpatient, your favorite cocktail for the agitated patient in the ER may only be used as an absolute last resort, unless patient gives informed consent.

Always try to talk the patient down. Humor and even soft bribes, such as sending out for his favorite pizza are appropriate means to avoid restraining the agitated patient. But,

don't wait too long to restrain and risk injury or death to either patient, staff or others at the site.

Here are the increasingly broad options for medical restraint today:

1. An Expert Consensus Guidelines/survey of leading experts in Geriatric Psychiatry and Geriatric Medicine for Agitated-dementia or delusions advised Risperdal, Seroquel or Zyprexa as first-line treatment and a combination of mood stabilizer like Valproate and antipsychotic for second-line treatment.

2. Eric Caine from University of Rochester Department of Psychiatry stated, "A 1999 survey by The American Association of Emergency Psychiatry indicated that a majority of medical directors supported the use of the atypical antipsychotics in the management of agitated, hostile patients with no available psychiatric history. The 2005 Expert Consensus Guidelines and the ACEP Guidelines, however, favor the use of either an IM Benzodizepine or IM Haldol over the newer atypical antipsychotics. Both expert groups recommend the older, traditional therapeutic approach in situations in which either no history is available for the patient or the patient's underlying illness is undifferentiated."

3. The Society of Critical Care Medicine clinical practice guidelines recommend IM or IV Haldol as the first line treatment for Delirium.

Jon Berlin, Past President of the American Association for Emergency Psychiatry, probably summarizes best practices in pharmacotherapy of Agitation: "Today the IM cocktail of Haldol 5/Ativan2/Benadryl50, or some variation – (i.e. 10/2//2 of Haldol, Ativan and Cogentin) - is still quite prevalent. It's effective, inexpensive and has a long track record of safety. Safety is a particular challenge when a patient's medical status is unknown or the individual is female and possibly pregnant. And sometimes people need to sleep.

On the other hand, heavily sedating someone for 6-8 hours can prematurely foreclose the evaluation or any attempts at crisis resolution that might help the individual to avoid hospitalization. Haloperidal is often a noxious experience too, making it harder to engage people in treatment later on.

The second generation intramuscular agents, Ziprasidone and Olanzapine – and now Abilify - represent a quantum leap forward, in my opinion. They're usually just as potent, but much cleaner. You can keep working with a person after this injection, and multiple case reports suggest that these newer medications are modernizing crisis treatment.

The main caveats are that we don't know as much yet about their safety with multiple repeat doses, that Ziprasidone should be avoided in combination with medication or conditions prolonging the QTc interval, and that Olanzapine shouldn't be combined with Benzodiazepines because of the risk of respiratory depression.

I recommend that everyone gain their own experience using both newer and older agents and deciding for themselves."

Image 18 on the Red Screen: Agitation on the Red Screen: Protocol for Haldol from Massachusetts General Hospital

As alluded to by Dr Berlin, other protocols may be tried in most cases.

1. Oral Zyprexa, *Zydis*10 mgs q-2-h NTE 40mgs/ day.

2. IM Zyprexa 2.5 – 10 mgs q-2-h, NTE 30 mgs/day **(Caution in use and dosing in medically vulnerable, due to orthostatic hypotension.)**

3. Risperdal M-Tab 2 mgs q-2-h, NTE 12 mgs/day (Caution, particularly young males, who are at highest risk for wry neck. Have an emergency prn IM Benadryl 50 mgs order on board. Caution with liver disease and for **orthostatic hypotension.)**

4. IM Geodon +/- Ativan: 10 mgs q-2-h, NTE 40 mgs/24 hours or 20 mgs q-4-h, NTE 40 mgs/24 hours. (Avoid use in known cardiac and renal patients.)

5. IM Aripiprazole: 9.75 mgs IM

6. Oral Aripiprazole: Start with 5 mgs. Titrate cautiously to 15 mgs/day to avoid Akithesia that can aggravate or mimic Agitation.

6. Droperidal is likely too risky to use in the medically impaired patient, but, in select cases is dosed at 2.5 – 5 mgs IM q-4-h, NTE 20 mgs/24 hours.

7. Liquid Depakene, 30 mgs/kg on day one, then 20 mgs/kg x two days as loading dose.

Here is the evidence:

Seroquel was found to be effective in reducing behavioral complications (including Agitation) of Delirium in orthopedic, oncology and neurosurgical patients and was well tolerated. Dosing started with 25-50 mgs and then titrated to 125-150 mgs per day, with a maximum dose was 300 mgs/day.

Haldol, Thorazine and Lorazepam were compared in Delirious AIDS patients. Lorazepam had to be stopped due to side effects and, alone, it was found to be ineffective. Low dosage Thorazine or Haldol were both effective in reducing impairment from Delirium and had no adverse effects, such as EPS. All parameters of Delirium improved, particularly cognition. (It is assumed that Agitation was considered an element of impairment.)

Oral Zyprexa 2.5-13.5 mgs was compared to oral Haldol 1-28 mgs following initial IV Haldol in consecutive adults admitted to an ICU. Both groups improved, but Haldol patients had some EPS and Zyprexa patients did not.

IM Aripiprazole 9.75 mgs was found equivalent to Haldol 6.5% IM for reduction of Agitation on the PANSS Exited Scale in Schizophrenia. (Caution: not approved for treatment of Agitation in Dementias due to higher rates of mortality following treatment versus placebo treatment.)

It is oftentimes more effective to combine Ativan and either Haldol or Geodon for sedation when needed, whereas Zyprexa is usually sedating by itself in adequate dosage. Caveat; avoid use of IM Geodon and Droperidal if concerned about cardiac status due to risk of Arrythmias or Orthostatic Hypotension, respectively, and consider Zyprexa or Aripiprazole if wanting to provide prn option of interchangeable IM or po routes – same dosing with Zyprexa and Aripiprazole, but different for Geodon.

Best Practices in the Management of **A***ltered* ***M****ental* **S***tatus*
Coma/**D**elirium/**(D)**epression/**C**onfusion/**D**ementia Syndrome

The remainder of this case presentation is fictional in order to present both the clinical fluidity of Altered Mental Status across the spectrum of the CD(D)DC syndrome and emphasize best practices. In the actual case of Ben, admission to Inpatient Psychiatry was forced, merely for sake of expediency. The real Ben was lost to follow-up in the real world, but try to follow along and think about diagnosis as our fictitious Ben's case unfolds in an ideal world we can at least try to emulate as best practices in the management of AMS.

The fictitious Ben was medically restrained with 7.5 mgs of Zyprexa IM. Medical restraint enabled staff to work safely and effectively in his intimate space to secure immobilization of his cervical spine within the displaced halo. Although remaining confused while tranquilized, Ben could understand and follow simple commands, such as "do not move your head".

Assuming an encounter with an unknown and seriously ill patient presenting anywhere within CD(D)DC spectrum, it is necessary to immediately invoke Small's Rule and

(Image 18 In the Pre-orange Zone: **Throw out the WWHHHIPMES.)**

(Image 19) ***W***ernickes is quickly cleared by direct and selective assessment of Gait for Ataxia and eye movements for ophthalmoplegia. This is a late stage complication of Alcoholism, and you will likely be able to know this with medical

certainty. But, even without reliable diagnosis of substance abuse history, don't wait. Treat with Thiamine and **hold the sugar.!)**

(Image 20) If in an adrenergic state compatible with a lethal ***W***ithdrawal syndrome, immediately rule out a Barbiturate Dependence by history. If unable to do so, place on Basic Life Support with an IV and cautious infusion of Barbital, switching to a standard po Phenobarbital Withdrawal Protocol as soon as clinical conditions permit.

(Image 21) Next make certain that the brain is being adequately perfused; either Cyanosis and/or low PO2 requires immediate Triage for treatment of ***H***ypoxic Airway Obstruction, Breathing Abnormalities or Circulatory Collapse. Nasal O2 is indicated as soon as CPR is either completed or ruled out.

(Image 22) Next rule out ***H***ypoglycemia by history of Diabetes and signs of insulin shock; if certain not dealing with Wernicke's, administer IV Dextrose stat. Diagnosis will be in the treatment response.

(Image 23) If not Hypoglycemic, then check or recheck that BP for ***H***ypertensive Encephalopathy in order to get that BP down before the patient dies.

(Image 24) Next, check for nuchal rigidity. If an acute presentation preceded by severe headache in a non-febrile patient, you have a Neurosurgical Emergency. Triage this patient to ICU or Neurosurgery - whichever is more efficient for catastrophic Intracerebral event. If very sick appearing and febrile, then use Universal Precautions for contagiousness, start life support and admit to hospital's most optimal bed for Infectious Disease or ICU to treat ***M***eningitis.

(Image 25) Once you have thrown out the WHHHIM, rule out ***P***oisoning, and, while getting history from collaterals and toxic screen, again start Basic Life Support.

(Image 26) ***E***ncephalitis can be a tougher diagnosis to make, but take no chances and start clinical management same as for Meningitis.

(Image 27) Finally, ***S***tatus Epilepticus is a Neurological emergency requiring emergency seizure intervention until the seizures stop.

For sake of time, I will not go into details about the treatment of these Neurological Emergencies. The take-home point is to remember them and know how to treat them so they are ruled out or treated before allowing a tranquilized patient like Ben to wait his time for definitive clinical intervention, thereby risking death.

(Image 28) **Pre-Orange Screen and Contagiousness:**
(*This should be updated for signs and symptoms that could be early warnings of Bioterrorism, Radiation Injury or agents of Chemical Warfare.)* Note these skin lesions;

actually Ben had a rather benign and excoriated erythematous lesion that did not appear to be contagious; know what is contagious, or protect yourself with universal precautions. And, in the post-9/11 world, know what the early warnings of Bioterrorism are.

Once you have protected yourself from risk of contagiousness and ruled out early alerts of a terrorist attack by nonconventional weapons, you may transition to the Very Urgent Care state of clinical awareness.

(Image 29) **The Orange Zone**

Most experienced acute care and emergency clinicians determine severity and rules and knowledge base of Triage intuitively, either explicitly knowing what they are doing or not. If and when experienced, they can usually do it effectively and safely, even though **it has been proven that all clinicians lack significant information for practicing every day of their careers.** But, for those encountering Ben's presentation sporadically, it is best to proceed by the rules of Time-determined Clinical Decision-making within the Very Urgent State of Clinical Awareness; this is The Orange Zone of clinical states of awareness where it is necessary to quickly screen for both Altered States of Consciousness that require diagnosis and treatment within minutes of presentation, in addition to Imminent Suicidality.

The mnemonic most likely to be both diagnostically sensitive and safe for screening very urgent disturbances of consciousness and suicidality is "Wash with (Image 30) SOAP before eating (Image 31) MAS TACO SALAD." How would this work during a very quick pass in Ben's case?

(Image 31) **S** = Sensorium – Ben was disoriented for date and place; so, unless transferred immediately to ICU or no other medical emergency presents, examine the Head for signs of trauma, such as tenderness, bruises, blood in the ears or Raccoon Signs of blackened eyes. Any such signs, with suspicion of incremental deterioration, immediately call for Neurosurgical Consultation for Subdural Hematoma. Check his pupils for equal size and reactivity. They will be unequal in case of an intracranial mass like Subdural hematoma, whereas in the equally urgent cases of DTs, Thyrotoxicosis and Atropine Psychosis, patients will have equal and large pupils. Atropine will restrict reactivity to both light and accommodation.

(Image 32) **O** = Output – Affect and Psychomotor Activity can be considered Connative Output and can be

(Image 33) too high in Manic State of Psychosis,

(Image 34) too low with apathy of metabolic encephalopathy or Abulia of Frontal Lobe damage, or

(Image 35) disorganized with fluctuations of delirium or labile mood states of Organic Affective Syndrome.

Ben presented with the disorganized Connative Output of Agitation; it was also too High, as in the Mania and Overactivity, NOS of

(Image 36)Hyperthyroidism. He also had a history of having Too Low an output – that both of the Somnolence and aesthenic weakness seen in (Image 37) Myxedema, (Image 38) Hyperglycemia and (Image 39) Uremia. Examination of the neck is necessary in the workup of the CD(D)DC patient in order to rule out both Thyromegaly and nodules. Was his Connative Output disorganized, as in Liver Flap commonly associated with (Image 40) Hepatocellular Degneration? Or did the police intervene just in time to reduce the mortality and morbidity of (Image 41) Delirium Tremens?

Physiological abnormalities, such as headache, circadian abnormality of sleep-wake cycle or disruptions of the Autonomic Nervous System may, in the case of either (Image 42) Uremia or (Image 43) Hepatocellular Degneration, be the only telltale diagnostic sign to direct specific life-saving treatment. Diaphoresis and Mydriasis with adrenergic states, as in DT's, or dry skin with either (Image 44) Atropine Psychosis and (45) Myxedema all support the search for Organic Etiologies assumed to be lethal in one hour without correct clinical intervention.

(Image 46) **A** = Apperception – Perceptions can be altered in all of these diseases, but Micro Visual Hallucinations should direct your treatment to DTs. Ben seemed Paranoid when getting to close to him, particularly when speaking in a loud voice. He must, therefore, be assumed to have abnormal perceptions, including hallucinations and paranoia.

(Image 47) **P** = Psychosis – One cannot differentiate Acute Brain Syndrome from Psychosis at this point, but one better proceed with an operational diagnosis of Psychosis NOS, because he is Paranoid.. Confusion may be the only sign of either (Image 48) Septicemia or (Image 49) Subacute Bacterial Endocarditis, although these patients are usually febrile, tachycardic and appear very ill with abnormal breathing patterns. Alcohol and Drug history are important for either (Image 50) Atropine Psychosis or ((51) DTs, but you might not be able to get a history. Then one must infer infer from examination in order to clinically judge, and, Ben was brought in by police for suspected intoxication.

The mnemonic, (Image 52) **MAS TACO SALAD,** is useful in screening for acute impulse dyscontrol. It is not useful to invest resources at this point in differentiating Harm to Self from Harm to Others; clinically that is splitting hairs. "DTO" and "DTS" are medico legal constructs that more often than not do not apply in the acute-care clinical setting; patients like Ben are more likely to be both dangerous to themselves as well as others. Would trying to rip a halo off to use it as a weapon, whether volitionally or not, be considered DTO or DTS? Better assume that Ben is both dangerous to self and dangerous to others until more is known about him.

Nonetheless, quickly run through the mnemonic;

(Image 53) ***M*** = Medical;

He is medically ill.

(Image 54) **A** = Previous Suicide Attempts.

If you can get that information and it is positive (Image 55), then stop there and place on highest level of suicide precautions. That information is not available with Ben, so proce (Image 56) **S** = Support. If supportive family present, you can have them help to avoid highest level precautions; if no reliable support immediately evident, assume the worse and place on highest level of suicide precautions until sucidality is cleared (Image 55).

(Image 57) **T** = Triad of Firesetting, Cruelty to Animals and Enuresis in Childhood; with the complete triad, the risk of impulse dyscontrol is extremely high, requiring Forensic precautions to prevent elopement. There is no childhood history yet in Ben's case.

(Image 58) **A** = Affect appears to be mixed state; his Agitation places him in a high output state, but he cries also, evidencing depression.

(Image 59) **C =** Culture of Violence. One must suspect that he has a police record, because he was bib police; so, make certain that Security is present. (Image 60)

(Image 61) **O** = Organized Mentally. Ben is extremely disorganized mentally.

(Image 62) **S** = Separating? We don't know

(Image 63) **A** – Alone? We suspect it, as he was found wandering without current contact with any friends or family yet.

(Image 64) **L** = Loss – Yes, at least his health

(Image 65) **A** = Alcohol – Suspect acute alcohol intoxication.

(Image 66) **D** = Drugs – Must have high level of suspicion for drug intoxication also.

Ben's profile for imminent and acute impulse dyscontrol is high, so, absent reliable supportive family at bedside, he needs at least One-to-One care, and perhaps

security, until adequately restrained. This should be documented along with first impressions re Sensorium, Output, Apperception and Psychosis.

"***Middle aged male with history of acute cervical spine injury. Disoriented, agitated and probably paranoid. High Output Psychomotor Activity. Cannot r/o Psychosis. Medically ill, bib by police with no obvious support system. High probability of drug and alcohol abuse. High Risk of DTO and DTS. So needs close observation in acute medical bed. Emergency cleared and ready for transfer from ER."***

Ben was admitted to a surgical bed at Northern in order to stabilize him for possible Neurosurgery or transfer in the morning to Southern Hospital. Dr Jones was the lone Hospitalist on duty for his Internal Medicine Group that night. He discussed the patient with the Attending ER physician, the ward Charge Nurse, and Ben's inpatient nurse on the surgical ward. After receiving the ER report and assurances from the Charge Nurse that the patient could be safely managed with one-to-one bedside care on the Surgical Unit, Dr Jones accepted the patient in transfer. So far everything was working well. Ben was being moved out of the ER in timely fashion to satisfy administrative Throughput. Finally, "Emergency" had been properly cleared in a way that spared both The Golden Hour for Ben and life and limb of staff and other patients.

The dual Neurological and Neurosurgical emergencies were cleared and stabilized, respectively, and the Very Urgent CD(D)DC etiologies were systematically ruled out in Ben's case. At this time frequent MSE checks must be ordered to detect both changes from baseline and fluctuations of Altered Mental Status. In this way, the Medical/surgical pathophysiology of an Organic Brain Syndrome can be verified.

With proper procedures in place for both monitoring the Delirium and managing Ben's Agitation and high connative output states of excitement and hyperkinesis, Ben could be safely managed on a medical/surgical unit. Psychiatric Consultation is oftentimes helpful in cases like this, if available, but inpatient Psychiatric treatment is rarely necessary. First of all, as with the real Ben, a psychiatric milieu is ambulatory, rendering fall risk for all patients, as seen in the real case of Ben, as elevated by his admission. Ben's halo was displaced, either during or early on in his Psyche admission. Secondly, the bar goes even higher for ordering emergency restraint in an inpatient psychiatric bed – even to the details of restricting with elevated bedrails against his consent!

What should Dr Jones do until either the Neurosurgeon and Anesthesiologist arrive or the patient is accepted for transfer to his own Neurosurgeon at Southern Hospital in the morning? Dr Jones wrote admitting orders to include a one-to-one sitter, Nursing Assessment to include efforts to attain collateral history from friends or family and medical records from Ben's attending Neurosurgeon across town at Southern Hospital.

What if Ben's level of consciousness descends into Stupor and Coma? One must continuously monitor and reassess mental status, because how often do we have it right the first time in clinical encounters with the unknown patient? Remain flexible, avoiding premature diagnostic closure via systematically following evidence-based rules of triage, but always be ready to reassess if or when the clinical presentation changes. (Image 67) Reassess button always returns user to the **Red Zone.**

In any encounter with a patient with Altered Mental Status, one can work smart and trap Organic Brain Syndromes before potentially lethal transfers to Inpatient Psychiatry. This requires working off edemiologically-informed statistics known for presentations of coma. This epidemiology transfers well enough to CD(D)DC spectrum disorders to work smart in triaging all Altered Mental Status.

I. Supratentorial causes of coma	20%,
A. Supratentorial Hemorrhages	15%
B. Other	5%
II. Subtentorial causes of coma	12%
A. Brain Stem Infarcts	8%
B. Other	4%
III. Diffuse and/or Metabolic Encephalopathy	66%
A. Drug Poisoning	35%
IV. Psychiatric Pseudodementias	2%
A. Conversion:	1%
B. Depression:	0.5%
Catatonia:	0.5%

Knowing the Likelihood for diseases in any acute presentation reduces the risk of working dangerously on the margins of this spectrum. To do otherwise risks missing the core pathologies that need to be identified right away in order to spare both function - and oftentimes life. In the case of the real Ben, the least likely etiology informed the definitive ER decision before other causes were ruled out.

(Image 68) Orange Zone: Connative Output, Disorganized.

Ben was hyper-reactive to sensory stimuli; Dr Jones's admitting diagnosis was **D**elirium, Etiology Unknown. Delirium is a disturbance of consciousness with inattention; it is accompanied by a very high acuity change in cognition or perceptual disturbance. Delirium develops over a short period of time with marked fluctuation in both intensity and mental production. It can be defined and understood operationally within the context of newly developed bedside testing criteria. These criteria are developed for purposes of diagnostic validity to both predict outcome in the ICU and inform treatment intervention. The **CAM-ICU** is a bedside test that is highly valid in directing clinical management of acute confusional states in nonverbal patients. These include the Geriatric, severely ill and demented patient.

"ICU Psychosis" or "ICU Syndrome" in Ventilator Patients had a traditional rate of false negative diagnosis for Organic Brain Syndrome – or CDDC – of 66 to 84%. The incidence is actually 80%. Post hospital morbidity and mortality rates are also very high. It is imperative, therefore, to detect, diagnose and treat Delirium. High inter-rater reliability and validity of the CAM-ICU identifies Delirium in the vast majority of ICU syndromes previously missed, and it is highly valid diagnostically for a syndrome whose high morbidity and mortality outcomes is only recently coming to light. Unfortunately, there are no long-term studies that demonstrate best practices in reducing mortality and morbidity.

Delirium is best defined by fulfilling all of the criteria of the **CAM-ICU** serial assessment that includes the following: 1. Either the Acute onset of Altered or fluctuations of Mental Status. 2. Associated Inattention and 3. Either Disorganized Thinking or Altered Level of Consciousness. The CAM-ICU requires minimal training and takes only two minutes to administer. With this tool, Intensivists can operationally define Delirium based on diagnostic validity that supports prediction of outcome. Inter-rater reliability of serial patient assessments by different staff is also high, thus supporting diagnostic reliability.

The four elements examined and serially documented are as follow:

1. ***Either Change in Mental Status from Baseline*** **or** a ***Fluctuating Course***. Mental Status is quantified by Mini Mental Status Exam.

2. ***Inattention***

3. ***Disorganized Thinking***

4. ***Altered Level of Consciousness.***

Level of Consciousness, #4, is based on **The Richmond Agitation-Sedation Scale (RASS)** and provides the lower default for Delirium.

0 = alert and calm

- 1 = drowsy

- 2 = light sedation

- 3 = Moderate Sedation

- 4 = Stupor; (Deep Sedation) -Unresponsive to voice but eye movements spared with physical stimulation

- 5 = **Coma**; **Unarrousable and Unresponsive to voice and physical stimulation.**

Determination that there is "no response to verbal stimulus" concludes the exam, as patient is diagnosed with either **Coma** or Stupor.

Element #1 is determined by comparison to admission baseline from either patient's history, his admitting documentation or collateral sources, like family. ***Any change in level of sedation from baseline within 24 hours fulfills criteria #1 for both Change or Fluctuation in Mental Status.*** And the criterion for ***Altered State of Consciousness - or, CD(D)DC and OBS - is defined operationally as any number less than zero on scale 0 to -5.***

To identify abnormality of **Attention**, the patient must be unable to pass simple tests for attention of either the Visual or Auditory versions of The Attention Screening Exam (ASE)*. Neither test requires verbal interaction with the patient.

If Delirium cannot either be specifically ruled in or out by now, then element #3, **Disorganized Thinking**, must be examined by most simple questions. **Disorganized Thinking** is present, if patient is unable to answer three very simple questions – i.e. Will a stone float on water? - or patient cannot follow the simple commands –i.e. "Hold up this many fingers. Repeat with other hand" (Show the patient two fingers on the first trial but none on second.) By doing this, both the verbal and nonverbal patient can be tested.

The IM Olanzapine was initially effective; so, Dr Jones ordered 7.5 mgs q-6-h prn, IM or po in the alternative form of Zydis. A one-one sitter trained in management of Agitation and Aggression was at bedside before Ben arrived. She was fully briefed by Ben's nurse, and was ordered to monitor her patient's mental status and behavior via both ratings on **CAM-ICU and Richmond Agitation Scale.** Security was alerted for potential backup in event combativeness emerged; the medical swat team was alerted in the event of rapid CNS depression approaching stupor or coma. **Availability of rapid response from both well-trained medical swat and security teams are essential in reducing fatalities and injuries to both patients and staff in hospital settings.**

The transfer did aggravate Ben's agitation; so, Dr Jones was paged to speak with Ben's nurse. A stat IM dose of Zyprexa was ordered 4 hours after his first injection. The additional IM Zyprexa reduced his agitation once again, allowing nursing assessment. Ben's CAM-ICU score showed fluctuating levels of consciousness and attention consistent with the diagnosis of **D**elirium.

Nobody was available to sign a release of information to obtain medical records from another institution, and Ben was not mentally competent to do so. For now, barring an emergency, Dr Jones or his partner would have to wait until Medical Records alerted them to their arrival; that could be hours, if ever.

So, Dr Jones must start from scratch with an Acute Care Workup tonight. Ben's nurse was able to contact the patient's wife, a reliable historian. There was even a lucid interval when Ben was able to give some history of his own; the nurse's aide was able to generate a Chief Complaint to direct investigation.

(Image 69) **Go through the Green Zone Chief Complaint**

"I can't do anything anymore. It's like being in a fog most the time. I'd be better off dead. Better for my family"

The history within this two hour time period is going to be limited by Ben's mental status. His wife's knowledge and ability to communicate, as well as the skills and **Positive responses to questions should be bulleted as critical items on the nursing assessment to** provide a busy attending with an initial template off of which to work:

(Image 70) The Green Screen and Demographics from Nursing report, including significant social and occupational history.

Occupation: Salesman
Religion: Lutheran, active in church until this year
Hobbies: Fishing and hunting; no interest for first time in life until this year

According to Ben's nurse, he was in and out of consciousness during her interview and had to be periodically awakened. His history, therefore, was of marginal reliability, but his wife did provide the following:

"Ben had been active until about one year ago, when he complained of gradually increasing fatigue. This was out of character for him, and he forced himself to go to work. He traveled a lot and missed his plane for the first time a year ago. A few months ago he did not come home, but he answered his cell phone. He was way on the other side of the city and didn't know how he got there. She and his brother went to get him, and he seemed dazed. His doctor was very concerned but thought he needed to see a psychiatrist, because he could find nothing new on physical examination. Ben

didn't want to do that; so, his doctor started him on Celexa for his depression. That made him feel better, but his fatigue persisted. She was still concerned about his depression, and his brother took Ben's weapons to his house for safe keeping. That made Ben even more depressed and sometimes explosive to point she was afraid of him. She worked and could not keep close track of him, but he started staying out late at nights. Then he hurt his neck with tingling in his fingers. The doctor told him he had slipped a disk and had some arthritis too. That is when he was fitted with a halo to immobilize his cervical spine in anticipation of a fusion to spare nerve function to his hands - critical to his work.. She thought he was drinking; tonight he did not come home. He prided himself on a photographic memory but couldn't even remember short shopping lists anymore."

(Image 71 from Green Zone) Critical Items

Onset 1 y/a with Fatigue followed by episode of Confusion
Period of Amnesia and got lost driving few months ago
Diagnosed as Depression and started by PMD on antidepressant
Mood improved on Celexa but fatigue persisted
Considered suicidal and guns removed from home
Losing his guns made him angry and he then became cxplosive at home
Started staying out late at nights for first time two months ago – drinking?
Neck pain with tingling in fingers started then too.
Neurosurgeon diagnosed arthritis of neck and slipped disk
Immobilized with halo with expected fusion of cervical spine to spare hand fct
His hands were necessary for his work
Severe memory loss in last months
Suspected he was out drinking tonight
Sometimes he would completely normal except for neck pain
Sister is Bipolar
Mother died of Alzheimer's Disease

At this point Dr Jones had to start the search for etiology to both stabilize and ultimately clear Ben's Organic Brain Syndrome. Working smart in a busy city hospital requires working methodically. His examination, therefore, had to be directed selectively by the presenting symptomatology. In that way he could quickly develop a valid differential diagnosis to inform either further testing or definitive clinical intervention.

When Dr Jones saw Ben, his wife was already at bedside talking with the sitter. He was in a light sleep but easily aroused verbally, unshaved and poorly groomed.

(Image 72) **Mental Status Examination in the Green Zone**

Ben's wife said that he was an impeccably neat dresser. Since installation of the halo, he really became sloppy with his dressing and hygiene. A neurologist and neurosurgeon had been trying to work with Ben since the onset of his neck and shoulder pain without having to perform surgery, but the pain had become worse and he couldn't use his hands either. Neck symptoms were all that she recalled being constantly present since this all started; prior to that he had been healthy. Except for persistent neck pain, he would seem normal for days at a time.

Dr Jones was already directing his selective examination by repeating the Review of Systems while simultaneously examining Ben. She had brought his medicines too; Ben was on Inderal and Chlorthiazide for Hypertension; Tramadol for Head and Neck Pain; Wellbutrin for depression and fatique; Haldol for Schizoaffective Disorder and Cogentin for Dystonia of the neck. "He wasn't reliable in taking medications when he was like this", she said. "Like this" meant confused, where he wandered, got lost driving his car and became very frustrated for not remembering names. As a top salesman, he had prided himself for having a photographic memory for people's faces, names and customers' likes or dislikes in life.

Dr Jones already knew that Ben had been moving through periods of **C**onfusion, lucidity with **D**epression for months. He was now in **D**elirium, and Dr Jones could not rule out a dementing process. Nor could he discharge the patient home, because he wasn't certain that Ben would not slide into stupor, **C**oma and death. He was, therefore, confronted with the workup of the CD(D)DC syndrome and hoped to reduce morbidity and costs by finding a reversible or curable etiology. He hoped to find a disease or psychiatric disorder that he could either treat medically or surgically or safely transfer to Inpatient Psychiatry for further assessment of suspected Pseudodementia. Past medical history and emergency workup so far was not revealing of specific etiology. And, assuming that Ben was not overmedicating, there was nothing so far to narrow diagnostic priorities. Alcohol and Drugs were an unknown at this point, although drug and alcohol screen was negative.

No precipitating event stood out to adequately explain such severe deterioration. A glaring lack of specificity of history with a waxing and waning course of multiple system involvement pointed more towards complex pathogenesis. This was not the history of cerebral vascular disease with telltale signs of stepwise progression following acute onset. Dr Jones would be negligent at this point to be working off the primary diagnostic hypothesis of Psychosis or Depression; this would be tempting for early diagnostic closure, due to history of depression related to neck injury and diagnosis of Schizoaffective Disorder. Such premature differential diagnostic closure based on collateral history is called "Diagnostic Anchoring", **a major fault in High Risk Medicine.**

In Ben's case, Dr Jones had to work up the presentation of **Cervical Spine injury and Delirium.** Unless he is the rare Hospitalist Neuropsychiatrist accustomed to working

such patients up every day, then another mnemonic, ***VINDICTIVE MAD*** can prevent common errors of omission.

VINDICTIVE MAD.

\`= Vascular Disease of the Brain
Example: Vascular Dementia with Delirium 290.41

I = Intraventricular
Example: Dementia ĉ Underlying Condition, Normal Pressure Hydrocephalus (331.3) This is believed to occur when there is obstruction of flow of CSF over convexities of the brain and absorption is impaired in the Superior Sagital Sulcus. Pathognomonic Gait disturbance is usually the first sign. Incontinence and mild to moderate dementia occurs in the late stage. Patients can have problems of aggression, withdrawal and depression. Primary NPH is idiopathic, whereas Secondary NPH most commonly has history of Subarachnoid Hemorrhage or Head Trauma, while Infection; tumor and neurosurgery are less common. The Idiopathic 1/3rd are often associated with Alzheimer's Disease, Hypertension or Parkinsons, but there is no evidence of selective comorbidity. These are most likely coincidental findings. Cerebrospinal Fluid is not regulated by pressure. If it is not absorbed in the Centeral Sagital Sulcus due to obstruction of flow, it can build up in the ventricles until the endymal lining absorbs it. Thus ventricular enlargement occurs with stasis of fluid. There is a return to normal pressure with alternative route of absorption.

N = Neoplasm
Example: Primary, Secondary or Remote Effect from such cancers as Bronchogenic CA.

D = Degenerative
Example: Dementia ĉ Underlying Condition, Multiple Sclerosis 340.00
Behavioral Disturbance
I = Infection
Example: Dementia ĉ Underlying Condition, HIV
With Behavioral Disturbance,
C = Congenital
Example: Epileptic Confusional State,
Partial with Impairment of Consciousness, Intractable
T = Trauma:
Example: Confusional State, Subacute
Postconcussion Syndrome
I = Intoxication
Example: Poisoning by Adrenal Cortical Steroids:
V = Vitamins
Example: Wernicke-Korsakoff Syndrome:
E = Endocrine/Metabolic

Example: Diabetes Mellitus, Type One, Uncontrolled, with Coma:

M = Metals
Example: Confusional State, Subacute:
Poisoning by Mercury:
A = Anoxia
Example: Anoxic Brain Damage:
D – Drugs
Example: Confusional State, Acute:
Drug Withdrawal:
Diazepam Dependence, Continuous:

History, Physical, Choice of Labs and Imaging must all be based on diagnostic hypothesis for Time-determined Clinical Decision-making - in this case two hours of safe time for an Acute Care presentation. The common practice in such cases of getting a CAT Scan to rule out organicity in the mentally disorganized and agitated patient falls way short of what has to be done. There simply are no silver bullets in Dr Jones's armamentarium to make the diagnosis that will save Ben's life, cure him or reduce future morbidity. At this point, any outcome remains possible.

Ben's wife provided a copy of Ben's Social Security Disability exam. It was performed by a local psychiatrist who originally diagnosed Schizoaffective Disorder. Ben never returned to this psychiatrist, but his Primary Care Doctor followed the Psychiatrist's advice and started Ben on the Haldol and Cogentin. As is commonly the case in outpatient Psychiatry with the Seriously Mentally Ill, Ben was only partially adherent. He took the tranquilizers mainly for either anxiety or during periods of time when his wife noticed his mood to be labile and his behavior impulsive with irritability. Haldol helped these symptoms.

The Psychiatrist properly noted that Ben had been a high functioning businessman with a college education. He appropriately suspected the defense of intellectualization. "The patient avoided speaking of his real feelings and continued addressing them as 'my disability with a guarded prognosis'. The Psychiatrist noted that such manner of speaking about the terrible loss in his life was inappropriate relative to his suffering and decided this to be either the classical denial of Manic Depressive Disease or avoidance of affect. He described Ben's affect depressed. Picking up on his self assessed loss, the Psychiatrist then followed up by asking him what he couldn't do anymore that he thought he should do?

"I could do things. I'm disabled", Ben replied. "The patient had rather quickly crashed in the prime of his life from a business he loved to being head of household to seek meager SSI payments and food stamps for survival. His wife could not conceal that they were literally watching their savings decline." The Psychiatrist was so impressed with Ben's pressured efforts to convince him of his "disability" and "guarded prognosis" that he even commented, "the patient is obviously so overwhelmed by his losses and fears for

the future that it is difficult to get him off the subject of his disabling illness and doubts for his future. His emotions are actually so close to the surface that the more I share my sadness with his plight, the sadder he gets and the more he cries." The consultant was satisfied enough with this response to state that his comprehension was adequate and that he was pseudodemented.

Pseudodementia is a presentation with cognitive deficits caused by a psychiatric disorder that clears with psychotropic medication. Folstein evaluated depressed patients while developing the Mini Mental Status Examination. He found so much overlap that he coined the term "demented syndrome of depression". In fact, most researchers find a negative correlation between acuity of memory and severity of depression; many patients suffer both depression and structurally based intellectual impairment. Pseudodementia is still a favored diagnostic term for this significant, but puzzling and heterogenous cohort of patients.

The preface, "Pseudo", is very misleading, because the cognitive symptoms and signs of Pseudodementia are real – not false, as inferred by the term. They are usually associated with a depressed patients' lack of effort, increased dependency, indecisiveness, and avoidance of responsibility caused by impaired motivation. The term, Pseudodementia, lacks specificity, implying mimicry of organic brain syndromes, absent a progressive course. None of these features, however, are proven; depression and dementia are common final pathways of pathogenesis, neither of which are well understood.

Heterogeneity, perhaps, is the most defining feature Pseudodementia. Are the cognitive abnormalities of psychiatric disorders that do not ultimately show neurodegenerative changes on autopsy really signals of abnormal neurocircuitry imbalance, or are they really "organic" noise deafening clinicians to the pure psychological impairment of an affective disorder?

We are usually talking about depression with Pseudodementia, because of its prevalence in the highest risk cohort for dementia. In fact, MAO increases with aging and particularly in the Alzheimer's patient. Remember that 2% of patients admitted in that previously cited study of Coma were Depressed, Catatonic or Conversion Disordered. In retrospective studies of inpatient admissions for Organic Brain Syndrome that included approximately 350 patients, nearly 10% ultimately showed no clinical findings of neurodegenerative disease. One study of 20 Pseudodemented patients found

1. Depression in 3/20
2. Anxiety in 3/20
3. Somatoform in 6/20
4. Hysterical Reaction in 1/20
5. Others in 6/20

The Maudsley study of 31% of erroneous dementia diagnoses found that most had Functional Psychiatric illness - many with depression. Thus the **(D)** in the CD(D)DC Syndrome. But more than one-quarter had a non-progressive organic brain syndrome

course, the majority having a profound affective component. Rothschild postulated an "X" Factor for this inexplicable clinical course that was neither medical nor psychiatric. **Caveat:** Most elderly patients referred for dementia and found not to have it, improve with psychiatric treatment, but later turn out to be demented within a few years of workup. In retrospect, it was found that many of these false negative workups ignored subtle neurological findings present at initial workup.

Highest alerting signs for subtle dementias in the depressed geriatric population are:
1. Cerebrovascular Disease
2. Spinocerebellar signs
3. Extrapyramidal Syndrome
4. Hachinki Scale greater than 4
5. Mini Mental Status Exam score under 8
6. Iatrogenic confusion from the anticholinergics effects of homeopathic doses of psychotropic medications.

Bottom line: it is very hard to isolate these cases in large populations referred for organicity. In fact, Wells finally settled on clinical course. He thought that the most distinguishing factor was the inconsistency of testing results from session to session that best identified the pseudodemented.

The Rochester Study performed a customized Neuropsychological Screening Test (NST) to initially assess and follow a large cohort of depressed patients earlier suspected of being demented in order to identify those patients who did **not** have a Neurodegenerative process. It was found that these patients can learn new information, even though their immediate memory is impaired. Alzheimer's patients, in particular, cannot recall either prior learned information or the people with them at events like birthdays. The NST uncovered Cognitive impairment that masked psychomotor retardation of depression. The Rochester study showed that Pseudodemented patients more frequently mimicked patients with Subcortical dementias, such as Huntingtons. These cases usually present with abnormal attention; obvious verbal elaborations and slowed mental processing, all pathogenetic markers for abnormality at this level of brain neurocircuitry.

But Dr Jones found a lot on exam:

(Image 73 from Green Zone) **Selective Directed Examination**

HEENT: Although there was a history of headaches and neck injury, Ben showed no signs of head injury other than his halo, which was not displaced. When Dr Jones attempted to awaken Ben to check his eyes, he spoke loudly into the patient's ear. "Ben, I'm going to look into your ear".

Ben startled and closed his eyes tight, trying to turn his head. His wife confirmed that he startled so much that he couldn't sit at the dinner table when like this. He would become furious when the TV was on. Ben had Hyperacousis.

In a far softer voice Dr Jones set Ben at ease and was able to get him to open his eyes. He elected not to do an ophthalmoscopic exam at this time, because of reported photophobia; it was late autumn and Ben had sunglasses on his nightstand. "He always wears those when he's like this", his wife said.

Far more cautiously and softly he asked Ben to look at his finger and follow it. Ben had nystagmus, but otherwise his Eyes were normal.

Cardiovascular/Respiratory. Pulse 100, strong and regular. BP was 150/100. He had been diagnosed with Hypertension before all this started but was put on Inderal when the EKG was abnormal six months ago. Auscultation of the Heart and Lungs were normal.

Abdomen; Examination was normal except for palpating and percussing the edge of the liver one inch below the ribcage; Ben winced on inspiration.

His wife could not verify his drinking because of his erratic behavior recently, but he was a only a social drinker in the past. He would get bouts of severe nausea and vomiting along with the headaches, all of which were new for him.

GU: No history here, although desire for sex was either way up when he was excited like this past week and nil when down and tired all the time. Rectal was deferred because of reported paranoia. Ben wasn't paranoid all the time, according to the wife, but would get to the point at home where he actually accused the kids of turning up the TV just to get back at him for one thing or the other.

Muskuloskeletal. Dr Jones was particularly concerned about that because of the apparent association of Neuropsychiatric symptoms with neck and shoulder pain. His neck and right shoulder were guarded, but otherwise exam was normal.

Integumentary: No lesions, other than Left Pretibial Excoriation over a faintly reddened area. It appeared to be an old lesion. His wife noticed Dr Jones's interest in this and commented, "When this all started, he would be itching all the time. He caused

that himself. Not out of the blue or anything like that. He thought that he had a spider bite. But that all went away."

Neurological: Ben showed normal strength by holding his arms straight up without drift, but he missed Dr Jones repeatedly on past pointing and had an intention tremor on his Right.

"That is what really bothers Ben; he is an expert archer."

He did have weakness of grip with hand and glove hypaesthesia bilaterally.

"It's the numbness and tingling in his fingers that makes Dr Corbett at Southside Hospital want to operate."

Reflexes were hyper and symmetrical. Ben's Gait was reported to be ataxic at times when excited or lethargic. It was not like the persistent and progressive pathognomonic gait abnormality that is the tell-tale sign of NPH.

Sensory exam showed signs of Radiculopathy, but also absence of two point discrimination across trunk, lower extremities and face, but Right was greater than Left.

Dr Jones ordered an EKG which did show a bundle branch block. Ben was being monitored for pain. So far there were no complaints; so, Tramadol was held – as was Inderal. His blood pressure was returning to normotensive without Inderal – probably due to reduced stimulation and pharmacotherapy measures for Delirium. He ordered a liver panel, endocrine panel, chest x'ray and MRI of the Head and Neck. One hour later, Dr Jones was paged; Ben just had a Grand Mal Seizure. Dr Jones ordered Dilantin and decided to get an emergency MRI and EEG. The MRI was performed and by then the EEG technician had showed up. Dr Jones was paged by Imaging to receive the initial reading; "Small White Matter Periventricular Hyperintensity consistent with Multiple Sclerosis." Asked whether Gadolinium Enhancement could be done right away to support the diagnosis, Dr Jones, somewhat shocked with a bittersweet sense of relief, ordered that. It was negative. The EEG showed diffuse cerebral slowing without focal lesion.

Dr Jones now had the labs. Complete Metabolic Profile and TSH were all normal except for elevated Total Protein, Alkaline Phosphatase and GTP, all of which were elevated with an AST to ALT ratio of 2.5. Blood Alchohol was zero. CAT Scan was initially read as normal, but when Dr Jones brought it up on his notebook, he thought that he saw some spotty, homogenous areas of decreased density in the cerebellum and prefrontal cortex. Following selective and directed examination, these were brain regions about which Dr Jones was particularly concerned.

At this point, then, how far along was he in his search? He could not rule out **V**ascular Disease of the Brain; in fact, he was worried about Multi-infarct Dementia, but Ben's course was not one of stepwise deterioration. It was, in fact, relapsing. His Ataxia

was described as that consistent with Cerebellar Disease, supported by finding of past pointing and dysadiochokinesis; gait disturbance in **I**ntraventricular abnormailites seen with NPH is far more complex than that described in ER.

Although the CAT Scan made a **N**eoplasm extremely unlikely, remote effects of a malignancy could not be ruled out. A **D**egenerative Disease process, such as MS, certainly could not be ruled out, even though Ben was a native of Southern California and lived there all his life. None of the dementias could be ruled out, particularly because he had a positive family history of Alzheimer's Disease. Although afebrile with normal WBC, an **I**nfectious Disease process could not be ruled out.

There was no history from a reliable informant to support a **C**ongenital disease or Idiopathic Epilepsy. The evidence for **T**rauma was more counterintuitive, because his wife could not remember anything happening to him to cause the cervical strain. Ben himself said that he simply felt brain dead – "couldn't recall much of anything happening". He did, however, think that he must have injured his neck, and the doctors at Southern agreed. **I**ntoxication, although apparently likely and supported by Hepatic findings consistent with Alcoholism could not be ruled out. Ben was gone a lot, and that was when problems occurred. Still, a previously religious man going on a bender at 49? Unlikely. No evidence of a **V**itamin deficiency. **E**ndocrine/Metabolic was still not ruled out; nor was an autoimmune process causing shoulder pain and radiculopathy. Exposure to toxic compounds like Mercury **M**etals seemed unlikely, because Ben was a salesman and did not work around toxic materials. He reportedly did have heart problems and was therefore put on Inderal as cardioprotective for Hypertension. His Oxygen Saturation was normal throughout hospitalization; so, he was unlikely to have been **A**noxic. There was no history of Barbiturate or Benzo use; nonetheless, **D**rug and Alcohol Withdrawal could not as yet be ruled out. Still, there was a robust affective component to this illness, with strong family history of Bipolar Disorder. And, despite his Delirious state, his facies was markedly depressed. His own chief complaint was **D**epression and **C**onfusion. Dr Jones rightly considered this patient unlikely to complain of being brain dead and depressed at the same time. If this were a stage of dementing illness, denial, rather than self concern would be the norm.

Dr Jones discontinued the Haldol due to concern regarding dystnonia and the fact that Olanzapine was working well. He then could also discontinue Cogentin and get rid of either a potential culprit or aggravating factor of anticholinergics toxicity, particularly if this were to be an idiopathic dementing illness with impairment of cholinergic neurotransmission. Neurology, Neurosurgical, Cardiology, Neuropsychology and Psychiatric Consultations were requested first thing that morning.

Dr Roberts, the Neuropsychologist happened to stop by first. **Diagnostic Specificity and Validity approach 90% in Dementias when utilizing Neuropsychological testing that specifically identify DSM IV criteria in well-selected patients.** As a Neuropsychologist, Dr Roberts knew that her testing in and of itself was incapable of either ruling in or ruling out Organicity. It had to be graded within a context of history and previous education. The patient also had to be at ease to obtain valid findings. Ben's Delirium had cleared on 10 mgs of Olanzapine bid, and he was at ease for testing less than 4 hours after admission. Dr Roberts interviewed Ben's wife and reviewed the Psychiatric Social Security report. Dr Roberts thought that the dementia of Ben's mother was more of a loss and stressor than a familial transmitter for Ben. That was a tough call, however, because of the early onset of Ben's cognitive decline. Ben's wife supported her impression, saying the Alzheimer's was a terrible stress for Ben. But, he spoke very little about his family. His wife told Dr Roberts that Ben was both the trustee for his mother and the replacement for a doting father in his sister's life. Ben always made certain that his sister stayed on her Lithium, but could not seem to understand what that had to do with his complying with his psychotropic medication.

Dr Roberts knew from experience that both initial symptoms and symptom profiles developed in courses of various dementias, even when supported by reliable collateral sources like Ben's wife, are oftentimes unreliable. In fact, Ben's youngest son, aged 15, was convinced that his Dad "had a stroke and wasn't psycho at all". It is always important to interview both the spouses and younger family members, because Dr Roberts had seen many times that the patient's spouse could easily share in the patient's denial. In fact, the son had been closer than anyone in making the diagnosis. Ben was far, far sicker than his wife revealed in her somewhat understated manner. She had learned through the months to "keep it together", as the marriage flip flopped back and forth through role reversals and periods of seeming normalcy. This was truly an episodic course, consistent with Bipolar Disorder. There was a family history of that and Bipolar Disorder robustly familial.

Dr Roberts observed a similar portrait to that documented in the Social Security Report. Ben seemed cool, calm and collective while stating his concern about 'disability" and "guarded prognosis". Having interviewed many demented patients, Dr Roberts detected a paucity of emotional words, rather than Intellectualization. Ben, she said, was filling a semantic void for literal loss of words, and he was educated enough to do so. She thought that he merely used the words he read in his disability reports while struggling to get through clinical interviews. It was not that he tried to avoid intense emotions; rather, he lacked the capacity to find words to describe his feelings.

Dr Roberts then asked the same question asked by the Social Security Psychiatrist, but she asked it in the present tense. "What can't you do that you used to do"? Ben's answer was, "Can do? Can do? I'm disabled". Dr Roberts noted that Ben seemed more pulled to the words of her question than actually answering it. Ben's apparent preoccupation turned out to be Perseveration. In fact, he was unable to suppress intrusion of previous words into other contexts. "I can. You can. Can it". Dr Robert's

query had merely interjected a word that stimulated its reuse. If a word or phrase is repeated within different contexts like this, the clinician must make certain that the patient can define it. "Your disability. Your guarded prognosis. What are these?"

Ben could not define any of these words, although superficially their repetition signaled preoccupation. To differentiate Affective Responses from Suggestibility and Pull, the interviewer must ask empathic questions with both cool objectivity and considerable show of emotion. "Ben, how do you deal with disability and guarded prognosis?"

When Dr Roberts asked this question in a neutral manner, Ben answered, "I can. I can."

When, however, she deliberately showed sadness on verge of crying herself, "But, I still can't see how you can deal with disability and guarded prognosis". He became emotionally incontinent with sobbing and tears that only stopped when Dr Roberts looked away and turned her back to him briefly. The crying stopped. Here the patient's sadness and crying mirrored the interviewer's attitude. Thus asking the same question with considerable empathy will either elicit strong affect or not, depending on whether the interviewer frames these perseverated words in an objective neutral manner or with considerable show of affect of her own.

Dr Roberts's clinical impression was that of Anomia, inconsistent with other findings more typical of very early Alzheimer's Disease and a relatively high MSE score of 25/30 on her Mini Mental Status Examination. This surprisingly high score demonstrates why attempts to correlate Neuropsychiatric findings with the Mini Mental Status Examination are only 61 to 86% accurate for specificity, depending on age. The exception is Major Depression **(D),** which occurs early in both Alzheimer's and Vascular Dementia. The statistical chances of depression showing in presentations of Alzheimer's approaches 90%; in Vascular Dementias, approximately 25% of presentations. And, these two diseases account for 90% of dementias. She herself had earlier in her career been lured into the patient's "case and story", and like Ben's wife, wished for the lesser of evils – namely, the Manic Depression of a sister, rather than the devastation of mother's Dementia, the worst news a family can have. As clinicians, our countertransference can mislead our line of inquiry to support what we want to know – rather than what we should know.

The clinician still cannot identify the stage of dementia by behavior manifestations due to its wide variability, but behavioral problems like Ben's Agitation and Impulsive Anger are twice as likely in late versus early stages of Alzheimer's. Ben was unlikely to be Alzheimer's, because of strong behavioral profile so early in the disease course. And, there is no correlation between level of cognition and variance in behavioral factors and insomnia. Dementia can precede motor signs in Parkinson's Disease. Trapping the pathogenic process of Alzheimer's Disease at the critically early stage of the disease, therefore, is confounded by lack of knowledge and ability to nail anything pathognomonic before its course reveals signature identity. By then the whole

portrait of wandering, delusions, anger, agitation, insomnia, personality changes - particularly in the older non-white psychotic patient who wanders – give it away. By then it's too late to anything at all to arrest its course with modern Cognitive Enhancing Pharmaceuticals.

So with this in mind, Dr Roberts obtained baseline Neuropsychological Testing

Executive Function

Although **C**onfusional State and **D**elirium have the same ICD9 code, they should not be considered synonymous. With the RASS we have operationally defined **C**oma/Stupor, and, with the CAM-ICU, **D**elirium. But, we know that people are confused, without being delirious for as many reasons as there are disease etiologies and mental disorders. Like defining Delirium and Dementia within the contexts of bedside tests, let's try to deconstruct "Confusional State" by first isolating the core elements of Executive Function:

Working Memory = being able to complete a task without forgetting where you are in it, where you have been and where you intended to go from the beginning.

Attention = Ability to focus in order to recognize important stimuli and stay focused on a particular task or stimulus.

Self Aware = Being able to reference self within the environment and an operation.

Initiation = Ability to act volitionally

Flexibility = Behavior that is autonomous of external and internal stimuli

Interference Control = Ability to shut out irrelevant stimuli and impulses

Planning = Ability to think ahead

Organization = Ability to structure one's operational field for necessary function.

For those desiring or needing mnemonics to remember syndromic criteria, particularly those who are business minded, try to remember **WAS IF IPO**. This mnemonic traps all necessary elements of normal Executive Function to register either acute and subacute change that can be a subtle - or a profound change of Altered Mental Status without either full blown Dementia or Delirium.

An example would be Acute Confusional State: 293.0
Jet Lag: 307.45

Remember Ben's missing his plane early on in the course of his deterioration and ultimately having to go on disability as a traveling salesman. He needed assistance boarding a later flight. His working memory was impaired. In this case the person might be so inattentive that he doesn't notice that a stranger took his passport from the counter. Or, he might pick up someone else's passport without checking name, country and photo. He might feel overwhelmed by all the novel stimuli of a foreign airport, where nothing appears familiar; so, he simply inflexibly follows the pack and misses his next flight. He may find himself unmotivated to either check his calendar to figure out what time it is now and when he has to show for a meeting – then be unable to prepare for it with proper materials to draft an agenda. Disorganized, he might inadvertently have checked through critical documents needed for preparation for a meeting, rather than transfer them to carry on luggage. Out of frustration, he may lose control of his anger at the customer service desk and be arrested for Disruptive Behavior.

Any one, more than one or all elements could be present. And, most importantly, the change in executive functionality is out of character. He is acutely confused, therefore, with Psychogenic Confusion, Reactive Confusion or Confusional State, Acute due to Disruption of the 24-Hour Sleep/Wake Cycle. If his confusional state does not clear with proper discipline for maintaining sleep-wake cycle, this change could be the harbinger, as with Ben, of more ominous Dementia with Acute Confusional State, Delirium or an Adverse Effect of Antigastric Secretion Drugs due to Misuse of Drugs, NOS

Set Formation means the establishment of an idea based on a concrete example – i.e. apples and oranges can define abstract concept of categorical similarities and differences. Ben was at the Honolulu Airport and catching a return flight home; this was something he had done over one-hundred times. It was a set of both time, place and processing information, such as checking flight schedules. He could nearly do this half asleep two years ago in Honolulu, even after a hard sales trip with Jet Lag. A hallmark of Alzheimer's Disease is a uniquely paired loss of set shifting and information storage for delayed memory. And, Neuropsychological testing is most sensitive in trapping abnormalities of Set Shifting in early Alzheimer's Disease. Inability to form an idea based on concrete examples – or, abstraction - is an ominous finding of later stage Alzheimer's, less likely to be responsive to pharmacotherapy. His failures across the spectrum of Executive Function were too early in a dementing process to be truly Alzheimer's. He **flunked testing of Visual Abstractions, Similarities, Proverbs and Trail Making.**

Language: Naming, Reading, Writing, Repetition, Comprehension

Providing a simple definition of "Disabled" was impossible for Ben. Naming is considered the most important franchise for healthy and sick brains in early Alzheimer's Disease. Anomia was the key finding distinguishing Pseudodepression from

Pseudodementia in Ben's case. Except for the vascular dementias that cause numerous language problems, Naming is fairly specific and isolated in early Alzheimer's Disease. It then gets progressively worse with the "mirroring", "pull", "echoing" and "intrusive perseveration" observed in Ben's examination. In the **Boston Naming Test** and more detailed Boston **Diagnostic Aphasia Test,** Ben named objects by their parts, a language problem seen in moderately severe Alzheimer's. Instead of saying, that's a 'Hand gun?' he said, "That's the trigger." Instead of saying, that's a Car, he said "There are the wheels". Again, his testing was demonstrating dementing abnormalities too early for the usual course of Alzheimer's.

Memory: Memory function is an excellent franchise for both the variability and sequential declines of aging. The critical clinical problem in Alzheimer's is the demand to identify dementing illnesses early enough to spare memory, despite the fact that it is not that robust a sign of early dementing illness! Yet, despite the fact that delayed recall does deteriorate after 50, **what is well learned is not forgotten in people with normal brain function**. A story with pictures, for example, can be learned with trials and is thus well learned; delayed recall of this story should be accurate in the normal aging brain. If not, the clinician must first correct for other factors, particularly attention. In this way, the clinician should be able to pick out Alzheimer's from other Frontal Dementias or Pseudodementias where learning is impaired on Mental Status Examination. Likewise, Recognition, such as recalling being with a certain person at a certain place, doesn't show decline with aging until after 70.

Dr Roberts needed to assess different known memory functions that both normally change at different stages of life and are most vulnerable to environmental stressors. Anterograde Memory is the most important known memory function. It slows with age, but data storage generally does not deteriorate when memories actually "stick well". Implicit Memory is the learning of new information without conscious effort to do so. This is one of the first visible signs of dementing illness, because a person might not be able to find a new way to work when the street is blocked on his usual route. Oftentimes, as in Ben's case, this will be the crisis leading to the first assessment for Dementia. Retrograde Memory means recall of things learned - usually in the remote past. The Clock Test, requiring memory of the details of a clock's face, can be an early sign of dementing illness. It should always be performed if suspected, because it is easy to do and nearly always tells the truth. The patient will oftentimes seem well organized but is unable to remember where the numbers and hands go after drawing a circle.

Ben's performance on the **CERAD Figure Copying Exam** was revealing. It demonstrated abnormalities more compatible with Left Frontal lobe language impairment than impairment for design replication. Dr Roberts was impressed with this differential, because his ability to replicate detail in designs was far less impaired than she expected. Loss of this ability to replicate detail is more typically the manifestation of Right Frontal Lobe pathology. Ben's Attention was just within the normal range on CPT. Ben's WAIS-R had declined from a reported 118 in High School to 100, mainly due to Anomia. It was clear to Dr Roberts that his Retrograde Memory and fund of Knowledge were

within normal limits. **Ironically, Korsakoff's Syndrome shows up as normal on the WAIS-R.** Dr Roberts was struck by the fact that Ben failed the **Delayed Recognition Span Test** for Picks Disease. In this Fronto-temporal Dementia, there is significantly disproportionate loss of Personality and Language than Retained Memory. **The CERAD Word List learning Test** and **California Verbal Learning Test** were in the Moderately Severe Range for Alzheimer's Disease in Ben's case, while his **Wechsler Memory Scale** was in the Mildly Severe Range, still manifesting mainly attention problems.
With this package, Dr Roberts was eliciting a portrait of chronic neurocognitive decline more typical of Fronto-temporal Dementia rather than Alzheimer's Disease.

Although there is no current substitute for careful history and examination, some other tests can help support either ruling in or ruling out a dementing process. One new test, The SLUMS, has been found to be particularly sensitive to mild cognitive disorders. This provides earlier default to search more intensively for a dementing process. When positive, it can select out the case whose course can be arrested for a significant period of months. And, we can reasonably improve such a result as both new drugs come to market and new combination pharmacotherapies are tried.

The Blessed Dementia Test is one I have found helpful in confirming the Diagnosis of a dementing illness, because it forces the necessary dual disciplines of:

#1. Carefully examining course of reported cognitive decline by

#2. Using reliable collaterals, rather than just the patient, for history. The patient we want to diagnose to begin treatment early usually only has mood-disordered symptoms. It is also best to get information from older and younger members of the patient's family, because their interpretations of cognitive change can oftentimes be significantly different.

It is said that the brain will deny the brain of another. Perhaps Alzheimer's Disease is so threatening, there is a human tendency, as in Ben's case, to look for the best news to give patient and family. Now, and likely even more importantly in the future, however, such subjectivity risks loss of an opportunity to intervene to arrest illness course. So, it is essential now to either rule in or rule out Dementia in Ben's case.

Charles Wells defined Dementia as a "chronic brain disease, generally regarded as degenerative and primarily affecting diffusely and symmetrically, the cerebral hemispheres." In a classic pre-MRI paper on "Chronic Brain Syndrome" in 1978, he emphasized the importance of diagnostic specificity in both identifying the syndrome of dementia and its differential diagnosis to determine etiology. "My current view is that the clinical diagnosis of dementia should be seriously questioned when thorough morphologic study does not account for the clinical picture. Pseudodementias are too common and too accurate in the mimicry of true dementia to permit diagnostic complacency. Also, Delirium may easily be misdiagnosed as Dementia, especially in the elderly, in whom the diagnosis of Dementia is often accepted too quickly and uncritically".

Both false negative and positive diagnoses are still all too common, both in primary care, as well as Psychiatry. In large scale studies of people over 65, upwards of a quarter of them suffered from Dementia; only a fraction of them were diagnosed. This high rate of false negatives cannot definitively point the finger at misdiagnosis; many of these patients were not in treatment – thus never worked up.

The more serious problem of false positive diagnosis has equally disturbing statistics, exceeding 40% in primary care. Even with screening by a Neurologist and Psychiatrist, the risk of false positive diagnosis approaches 20%! According to Wells, "the conclusion is inescapable that diagnostic errors of omission and commission are not rare, even when patients are evaluated carefully by psychiatrists and neurologists".

What causes such a high risk of error for both false positive and negative diagnoses in the patient presenting with cognitive symptoms and signs? False negatives are most susceptible to error, usually due to failure to even consider asking The Question. Caveat! The demented patient does not complain of cognitive problems. Early on, chief complaints are frequently those pointing to mood or somatization disorders; high functioning people can conceal their deterioration well into the moderate stages of the disease. These patients are notoriously unreliable informants, requiring either a complete Mini Mental Status Examination or anamaneses from friends and relatives to make the diagnosis. But, the diagnosis too often awaits a major functional crisis at home or work, oftentimes in the most dangerous situation of driving a car.

False Positives, on the other hand, occur from a very different source of error. The Pseudodemented patient flunks the Mini Mental Status Examination, while cognitive impairment mimicking organicity is oftentimes concomitantly supported by friends and relatives. In these cases, clinicians sacrifice a longitudinal history of behavior for the snapshot of a first clinical encounter. This cross sectional snapshot, particularly in the first encounter with an unknown patient, oftentimes includes excessive diagnostic sensitivity via ancillary testing, such as Psychological and Imaging Evaluations. No testing has diagnostic specificity early in the dementing course, the most critical time requiring specific clinical interventions.

Or, the clinician does not deliberately compare the cross sectional findings at first clinical encounter with longitudinal behavioral functions of potential disease course. The depressed patient, for example, may flunk an exam but maintain an impeccable driving record – i.e. gets back and forth to your office without any problems. This behavior is simply not compatible with Dementia. Neurosurgeons specializing in treatment of Normal Pressure Hydrocephalus will always say that they can select good surgical candidates better on the street by watching them walk than from thousands of dollars of imaging studies. The NPH patients' mentation on exam may not give them away, but the unique peculiarity of their gait does - "spastic, ataxic, spastic-ataxic, or apraxic". Such multiform presentation of gait is more often than not pathognomonic of Normal Pressure Hydrocephalus – ironically, far more so than neuroimaging, which can never be specific enough to inform neurosurgical intervention. "Dementia remains a clinical syndrome

that must be established by clinical evaluation", Wells stated. And, his words remain true today.

Geschwind realized decades ago the growing importance in identification of dementia when estimating a prevalence of 40% unrecognized "physical" brain disease in the chronically institutionalized population. There can be no justification anymore for failing to accurately diagnose Dementia with either its specific etiology, as in AIDS, or pathogenesis, as in Alzheimer's Disease.

Three series of 222 well diagnosed Dementia patients allow us to be epidemiologically-informed by knowing the Likelihood of degenerative neuropathology when encountering the apparently demented patient. Adjusting to higher risk for AIDs and Drug Toxicity - both Iatrogenic and Abuse - this epidemiology is probably still valid. Both the correctible and reversible causes that follow demonstrate the importance of both accurately ruling in Dementia and correctly diagnosing its etiology and/or pathogenesis.

The cognitively impaired patient with robust dementing clinical features, therefore, is no longer syndromic. This patient either has a disease under ICD9 or a Psychiatric Disorder under DSM coding. Correctible causes requiring intervention were found in 21% of these Dementias and Non-correctible causes requiring clinical interventions – i.e. malignant brain tumors – were found in 76%. The latter cohort must now include Alzheimer's Disease. In Ben's actual ER presentation, this Epidemiologically-informed clinical decision-making was neglected; Ben was not a Psyche patient. There are way too many real Ben's initially admitted or transferred to Psychiatry. "The search for etiology in dementia can no longer be considered a luxury", stated Wells in 1978. And he did not as yet even know of Tacrine!

Working Smart by knowing Likelihood of confronting a Dementing illness during an encounter with CD(D)DC syndrome requires general knowledge of the following epidemiology:

Alzheimers Disease or Fronto-temporal Dementia (Picks Disease)	51%
Vascular Disease	8%
Normal Pressure Hydrocephalus (NPH)	6%
Dementia in Alcoholics	6%
Intracranial Masses	5%
Huntington's Chorea	5%
(D)epression	4%
Drug Toxicity	3%
(People who are over 65 use 25% of all meds; only 5% use none)	
Well known suspects:	
Propranalol, Anticholinergics, Haldol	
Dementia Uncertain	3%
Other (Each less than 1%)	9%

Creutzfeld-Jakob Disease (Dementing Disease of the 5th and 6th decades is associated with progressive neuro abnormalities, particularly Myoclonus. Ten per cent of these cases are familial with a rapid course of less than one year to death. This disease is suspected of being infectious, because it has been transmitted between husband and wife via a Corneal Graft. Creutzfeld-Jakob Disease can also be transmitted - with long latency period - to animals from humans. These extremely rare cases of apparent contagiousness in a rare, genetically determined dementing disease infer a potential etiological relationship between heredity and contagious infection. As such, they have profound research ramifications for finding causation in all dementias.

Head Trauma
Metabolic- Electrolytes, hepatic, renal
Inflammatory - Lupus
Endocrine – Hyper and Hypothyroid, adrenal and parathyroid
Trauma – Subdural Hematoma
Post-encephalitic, such as Herpes Simplex Encephalitis with acute onset and little evidence of cerebral inflammation. This disease can mimic Schizophrenia in acute onset of psychosis.
Subacute sclerosing Enceephalitis (SSPE). a dementing disease preceded by Measels before age of 2 with 2-10 year latency until onset of dementia and associated myoclonus. Progressive Rubella Encephalitis is rarer and follows very late after General Measles. Progressive Multifocal Leukoencephalopathy (PML) occurs by infection in immunologically compromised patients and leads leading to death in 3 months;
Saccoid, lymphoproliferative disease,
TB,
Neoplasms
Direct CNS invasion
Remote effect. Usually it is Brochogenic CA, but less often ovarian, prostate, rectal and breast cancers can cause remote dementing CNS impairment.
Immunosuppressive Therapy.
Kuru, a cerebellar disease with similarities to Scrapi in Sheep can be transmitted from patient to animal and, as in Creutzfeld-Jakob Disease, Scrapi in Sheep is caused by a unique viral transmissible agent.
Neurosyphillis
Amytotrophic Lateral Sclerosis
Post-subarachnoid Hemorrhage
Parkinson's Diseease where Dementia can precede motor deficits.
Perniciious Anemia, in which Dementia can precede anemia
Folate Deficiency
Pellagra
Wernicke-Korsakoff's where IQ can remain normal.
Liver Failure
,
The first rule/out in Ben's case will ordinarily be Alzheimer's Disease, particularly because of positive family history. Neuropsychological Testing profiled

Frontal Temporal Dementia because of findings incompatible with an Alzheimer's disease course. But, exceptions can rarely occur, wherein specific Neuropsychiatric deficits show up early in the course of the disease – i.e. his severe problems in abstractions and language deficits within only a one-year course of episodic cognitive impairment. Dr Jones had to know that the Likelihood of this presentation being that of Alzheimer's Disease was close to nil; so, he had to press on and Work Smart.

There is no silver bullet to relieve Dr Jones of studying the course of the disease to determine whether Ben's history conforms to recognized stages of disease. Although symptom profiles have been developed in courses of various dementias, it is not clear yet that history, particularly collaterals, are specific. Nonetheless, interviewing the family is necessary, because of the unreliability of the patient's history and denial. And here is what they initially report about the patient:

Forgetfulness 90%
Confusion 50%
Depression 44%
Agitation 36%
Inattentiveness 32%
Getting Lost 30%
Language Problems 26%
Motor Problems 18%

The mean number of symptoms reported was 3.26 +/- 1.95, with multiple signs initially reported in 74% of cases. Caveat: Spouses and younger relatives report differently; so, it is advisable to interview different members of the family to get a valid history of the onset of disease. Older patients are more likely to show wandering and psychosis. Non-white patients are more likely to present as psychotic. Gender is only associated with anger and aggression - males presenting with it more than females. But, behavioral problems of anger and agitation are twice as likely to present in late versus early stages of the disease.

Due, to the wide variability of Alzheimer's disease course, the stage of dementia cannot be identified by behavior manifestations alone; they can be early. Nor is the level of cognition responsible for variance in behavioral factors, such as sleep/wake disturbances. Again, as Rothschild stated, there is likely an X factor early in the pathogenesis of the disease that derails progressive elements within our current template for disease progression. This unknown dimension prevents uniform categorization into traditional stages. And, this "X" factor is the most prominent feature in Ben's presentation. Neuropsychological testing showed Frontal Temporal Dementia, rather than the Alzheimer's diagnosis dreaded due to his mother's fate. Pseudodementia was supported diagnostically by both robust family history of Bipolar Disorder and his response to psychotropics. And Ben's disease course was episodic with apparently lucid intervals.

Etiology was of utmost importance now, because time was of the essence to find a treatment intervention. Only the emergence of a rare dementing illness without any known treatments reduced the risk for Dr Jones and North Hospital; Ben's history and clinical course simply did not evidence anything of that kind.

Rothschild hypothesized that certain individuals – specifically personality types – were at higher risk for having the factor X of necessary final common pathway of Dementia. Neuropsychological Testing has provided robust evidence to support the pathogenesis of Dementia causing "excessive" morphological neuropathological changes – namely "excessive" loss of brain tissue. He found that the greater the loss of tissue, the more profound the failure elicited in Neuropsychological Testing. Similarly, Demented patients coming to autopsy show more senile plaques and neurofibrillary tangles than non-demented patients.

Refining Validity of Diagnosis in Chronic Cognitive Impairment to Inform Pharmacotherapy. (Image 74 Go ot End of Green Zone for Neuropsychiatric and Neurological Testing)

Dr Jones was about to finish his duty, but he returned to see Ben one more time. The patient was sleeping now. His wife reported that Ben had bitten his tongue and been incontinent; this was a true Grand Mal Seizure. There was no previous history of this in either childhood or as an adult. The Wellbutrin was discontinued and entered as contraindicated in this patient. "He looks so sad, even when he's asleep".

His wife responded that he had been unable to smile most of the time since having Bells' Palsy. "Both sides so his mouth droop that way?"

She confirmed that –"both sides simultaneously. That was about his last day of work."

"What kind of a salesman?"

"Ben sold Archery Equipment. His region was Los Angeles County and Hawaii. He got this Bells Palsy a month or two after his last hunting trip."

"Where was that?"

"Northern Minnesota. He goes up there during their bow hunting season and has a video crew with him. They said he was fine up there."

"And the bug bite?"

"He had that when he got home. He thought it happened up there,"

Although the skin biopsy was consistent with an insect bite, the Neurologist diagnosed Lymes Disease based on the course of the illness, the findings and failure of Gadolinium enhancement to confirm MS, an imaging finding highly specific for MS. The diagnosis of bilateral Bells Palsy was almost as pathognomonic for Lymes Disease as were the MRI results.

Because Ben met the criteria indicating antibiotic treatment for being in a high risk zone – the long days and weeks in the Minnesota woods – it was decided to start him on IV Ceftriaxone. Ben had an 80% chance of responding, and a 60% chance of not relapsing. Because the infection was systemic with Neuropsychiatric, Musculoskeletal, Hepatic, Dermatologic and Cardiac manifestations, the standard immunoassays to confirm Lymes Disease were ordered fpr the Lymes antigens specific for Spirochete, Borrelia Burgdorferi.

Comparing Bp specific Antibody in the CSF and the same Antibody in Serum provides an Intrathecal Index. A ratio above 1 is strong evidence that the pathogenic spirochete is primarily active in the Central Nervous System, supporting the diagnosis when presentation is purely Neurological and Neuropsychiatric – which it was.

Ben recovered completely and has returned to his occupation, including archery. He no longer leaves his sales territory, but there is no contraindication for his doing so.

In Ben's case, there was no significant history prior to the onset of symptoms one year prior to presentation in the Northern ER. There was both a robust family history of well diagnosed Affective Disorder and Alzheimer's Disease, as well as a presenting complaint of suicidal ideation and Confusion. Due to the episodic nature of the illness and wide swings of Connative Output, Ben's denial and a negative CAT scan faked clinicians into a Pseudodementia diagnosis of Bipolar Disorder. His affect was contagious enough to warrant psychiatric diagnosis overweighted the mood disorder first observed in Pseudodemented patients by Wells. Pseudodmenetia was mistaken for Pseudodepression, because Ben's language deficit was misinterpreted as emotional distress.

Mental Status Exam showed mild impairment, but it did not correlate with any clinical profile during the early stage of Familial Alzheimer's; Psychological Testing elicited signs more compatible with Picks Fronto-temporal Dementia. His EEG showed diffuse slow waves, and an MRI of the head was a red herring until repeated with Galladiminium. He said his confusion was "like being in a fog". Then, he slipped from Confusion to Depression and transited through Delirium to suspected Dementia. Nothing but the classical initial complaint of "brain fog" and his social and clinical history was pathognomonic of a curable infectious disease.

Even in this era of Psychopharmacology and high tech diagnosis, listening with the Third Ear of clinical experience is still imperative;. Ben fooled some skilled clinicians in some high powered institutions in this mythical, yet most possible presentation. Despite an ability to engage the staff as if he were mood disordered, his

CNS, Hepatic, Cardiac and Cervical Spine pathology had already threatened to maim and kill him just one week before he both threatened to kill himself and descend into lethal Coma.

Lymes, as we can see in the case of Ben, is known as the Great Imitator. Dr Jones had never seen Lymes Disease before, but he worked smart. He did not know at the time that Lymes Disease had been reported in 49 of 50 states- Hawaii, where Ben usually hunted was the only one never reporting it. It would therefore be high on the list for premature closure of differential diagnosis in Southern Californian hunters only going to Hawaii on regular basis, particularly for both patients and doctors who are native and longtime residents there. Likewise the Cardiologist was able to rule out atherosclerotic heart disease and reduce Ben's medicine to only a diuretic.

Ben was well diagnosed in less than 24 hours, but in the real world, the pressure is on for premature diagnostic closure and least restrictive disposition. Such cost-determined haste invites diagnostic anchoring based on invalid ICD9 codes – in Ben's case, an affective disordered Pseudodementia. Ben's case is the catastrophe waiting to happen with every case of CD(D)DC presenting at every point of care every day and every night of the year. Only because the Intrathecal Ratio was above 1 did immunoassay support the diagnosis of Lymes Disease in the ideal world of both Northern and Southern's best practices. Special attention paid to ordering proper imaging, consultation questions and lab tests resulted in less common but specific proof of the spirochete within Ben's serum. And, the Intrathecal Index placed the pathogenic Spirochete in Ben's central nervous system, thereby explaining his primary Neuropsychiatric presentation.

The Neuropsychologist would have had little to offer in this case with positive findings for an early dementing illness had the Neurologist not narrowed the field of focus with both "course of illness" and "hard findings to date". The Neurologist could immediately zero in on Ben's pathology, because Dr Jones kept his differential open, returning to bedside to re-examine Ben's depressed facies. That is when Dr Jones described the nearly pathognomonic findings of bilateral Bells Palsy. The Psychiatrist had relatively little to do in this case; familial history of mood disorder and Alzheimer's, although of significance, was outweighed by epidemiologically-informed clinical decision-making in this case. The Psychiatrist could manage Ben's organic Affective and Psychotic Disorder with supportive psychotherapy and titrating the already effective Olanzapine. He advised a trial on minimum dosage of Effexor at 18.75 mgs bid to get lift in mood without eliciting the side effect profile for that combination. Ben had to be monitored for weight increase and potential aggravation of his hypertension. But, in Ben's case, the primary drug for his remission would be an antibiotic, promising recovery – or at least significant response or remission.

This case is not presented as a study of Lymes Disease, but as a keystone case for clinical decision-making in all clinical encounters with the CD(D)DC Syndrome. One disease can manifest across all parts of the spectrum, seducing the unsuspecting clinician

into either premature closure or even clinical blindness. In this case it was the early diagnosis of Bipolar Disorder due to his affective presentation and family history. Anchoring, on the other hand, with diagnoses of either Idiopathic or Alcholic Dementia could have led to an early death for Ben, if treated with Anticholinesterase Inhibitors. Whether establishing specific diagnosis by trapping either one presentation of CD(D)DC or its flow through some or all 5 sub-syndromes, clinicians risk missing serious morbidity, and even mortality in almost all underlying diseases.

When valid diagnosis is made in early stages of Alzheimer's, the serious morbidity is now only delayed by at most several months. Such delay should be considered serious morbidity, because it robs golden time for both emotional and administrative preparation for the suffering and complex bereavement lying ahead for families. The Great Imitator of Lymes Disease should be a constant reminder to Work Smart. That means being both Epidemiologically-informed and proceeding in first encounters with unknown patients via the evidence-based rules and knowledge base of Time-determined Clinical Decision-making.

Certainly, in Ben's case, Dr Jones could not be expected to know much about Lymes Disease. He was native to an area where neither he nor any one he knew had ever encountered it. He was, however, counterintuitive enough to quickly determine that Ben's case was more likely than not very low in Likelihood for Southern California, California cases more likely eminating from the Redwood country of Marin County. Lymes Disease is usually contracted in the northern woodlands, but it has been diagnosed in 49 out of 50 states – oftentimes, as with Ben, without history of contacting the pathogen. And, Dr Jones's counterintuition for being Epidemiologically-informed and Working Smart prevented premature diagnostic closure. It was the way he worked – following triaging rules that prevented potentially fatal diagnostic anchoring in invalid diagnoses of both Pseudodementias and Pseudodepressions.

We know that Ben is the last type of patient that should be expediently dumped internally on the ward that resists his admission the least – oftentimes "Psyche". Any potential EMTALA fine or loss of DRG reimbursement that is caused by thorough assessment of the CD(D)DC Syndrome is peanuts compared to the medical and legal risks of negligent practices so endemic with Altered Mental Status. Berkeley Rice, while Editor of Medical Economics, spoke the most disturbing truth in an article, "Doctors Bringing Attention to Safety Problems in Hospitals more often than not are Disciplined for Disruptive Behavior". A deadly silence, therefore, is often the practice within too many healthcare systems. They "run so lean" that they don't allow true "lean engineering" to improve quality by reducing internal hazards to best practices. Nowhere is this more true than in first clinical encounters with the CD(D)DC complex.

So much of this High Risk Medicine is associated with aging that Medical Negligence has been somewhat underrated as potential malpractice. The lifetime incidence is 100%, but clinicians must judge when definitive care is required and when palliative is. The fix could be as simple as going back to the Chief Complaint for the tell

tale symptom; Ben's "Brain Fog" is nearly pathognomonic for Lymes Disease. Also, in documentation for Time-determined Clinical Decision-making, all questions should have value or are not worth asking and writing. How much time and suffering could have been saved by clarifying the routine demographic entry, "Salesman". What kind of salesman? Selling archery equipment will raise the eyebrows of almost any clinician, the majority of whom will connect working in the woods with something perhaps esoteric for them. And, most of those clinicians, even in Los Angeles, who are already getting counterintuitive and searching their brain hard drives, will remember Lymes Disease.

The hypothetically happy ending for Ben, of course, is not the usual stuff of our daily work in acute, chronic and emergency care settings, particularly for Lymes Disease, suspected of being missed most of the time! Dr Jones was on the fly that night when encountering Ben for the first time; no way could he have known from history, labs and imaging, what disease could present this way. He needed Radiology, preferably Neuroradiology; Clinical Pathology: Pharmacy; Nursing: Emergency Medicine's initial report and Neurology. Neuropsychology was supportive, but the last thing he needed that day was a Psychosomatic Medicine consult. He eventually needed them to support the operating diagnosis for treatment planning.

The tell-tale for counterintuitive Epidemiologically-informed Clinical Decision-making turned out to be disease onset and course and not a silver bullet diagnostic for any disease. When the records finally did arrive days later, Dr Jones discovered during dictation that both Northern and Southern were getting to the same diagnostic place almost to the same day. Usually, such convergence of system knowledge is not known when patients are diverted to different healthcare systems during nights and weekends.

Finally, Ben's case brings fresh light to complex disease models, rather than reductionistic diagnostic anchoring in such terms as, "This 75 year old Schizophrenic male". Ironically, the onslaught of Autoimmune Deficiency Disease has forced clinicians to think in terms of multiform causation – Rothschild's "X" factor suspected long ago for Alzheimer's. Whether Schizophrenia, Dementing Diseases or the neat unitary model of Lymes Disease, multiple host-environmental interactions are key to both current treatment and success for future treatment; bypassing both time-determined and epidemiologically-informed clinical decision-making via expedient Psyche diagnosis is malpractice, whether or not it is ever discovered. We are still bound by nosology; perhaps way upstream in Ben's pathogenesis, everyone was right with the wrong labels for final common pathway.