An Older Patient
with an Old Disease

Inter-Hospital Geriatrics Meeting
27th April, 2012

Dr CY Ting
Dr MF Ng
Tuen Mun Hospital
• Geriatric Consultation:
  • “I’ve got a patient admitted for some **Behavioural Problem**, can you take him over to Geri Bed? *You know, beds are tight in our ward...*”

  • “Sure, but can you tell me more about him?”
Brief History from Case Notes

• Mr Chan, 91 year-old
• Lives with wife
• ADL independent, walk unaided

Past Medical History
• Hypertension
• Atrial Fibrillation (aspirin)
• Diabetes Mellitus (diet control)
• BPH (TURP 2009)
• Admitted for Right Pneumothorax
  • 10/2011 – 15/12/2011 (Prolonged stay)

• Date of this admission: 21/12/2012 (Day 6 post discharge)
Brief History from Case Notes

• Clinically admitted for carer breakdown
  • Drug refusal
  • Nocturnal wandering

• Deny any symptoms by patient
Current Medications

- Aspirin 80 mg daily
- Pepcidine 20 mg bd
- Zestril 15 mg daily
- Terazosin 2 mg daily
Fu GDH
clinical admission because caring problem
due to persistent confusion

Early FU / refused drug taking at home
Noted by wife to have taking bath for 2 hrs yesterday
nocturnal wandering +ve
carer breakdown +ve

P/E:
urine ++ for WCC neg for nitrate
Disorientated in time
Person & place OK

- Augmentin added for sepsis
  WCC 13.6 ->9

TFT N

(Week 1)

Progress
MMSE 20/30
MBI 100
still in persistent confusional state with disorganised behaviour

Not a very low score for MMSE and especially BI, for a patient in confusion.
Dementia Work Up (1)

• MMSE 20/30 (P6 Education) (week 1)
• BI 100/100

• CT brain
  • Old lacunar infarct

• B12: normal
• TSH: normal

• VDRL: positive
• TPPA, EIA: positive
Dementia Work Up (2)

• Lumbar Puncture attempted
  • Dry tap

• Treat as Neurosyphilis
  • Benzyl Penicillin G
    (Intravenous, 3 million units Q4H, IVI, for 2 weeks)

(Dose for Neurosyphilis)
Progress (Week3)

- Persistent confusion and behavioural problem at night
  - Added Haloperidol 0.5 mg Nocte
  - Consulted Geriatrics Team
And then, patient was transferred to Geriatrics Ward.

...Anything we would have done differently?
And we start again from...

HPI (Informant: Son)

• Asymptomatic all along
• Handled all his activities of daily living well
• No memory or behavioural problem before

• Before retirement: Manager in a Company of Construction Material.
• Handled selling and buying.
• Good at numbers and calculations.
• ADL:
  • Independent
  • Cook food sometimes, go out to buy ingredients himself

• Finance: handled by son all along

• Hobbies:
  • Newspaper reading everyday
  • Going out to chinese restaurant to “yum cha”
• Admission for Pneumothorax (Oct 2011)

• Persistent confusional state after discharge (Dec 2011)

• No documentation about mental state during the admission

• Clinically re-admitted on Day 6 post discharge
More History

- **Drugs refusal** (not persecutory, he thinks he does not have any problem with his health)

- **Nocturnal wandering** (fair sleep, getting up in mid-night, doing his daytime usual activities)

- **Taking shower for 2 hours** (patient forgot how to and just stood there, figuring how)

- **Stays in restaurant for whole day, telling others that he was waiting for his son, who will be picking him up, while his son is not**
• No disinhibition
• No change in personality
• No stereotyped or ritual behaviors

• No history of fall
• No hallucinations
Physical Examination

• Speech: fluent
• CN intact
• Power 5/5
• Tone normal
• Reflexes normal
• Bilateral plantar down going
• No cerebellar signs
• No resting tremors

• Primitive reflex negative

• No Argyll Robertson pupils
• Romberg's Test: negative
• Proprioception normal
• Gait (video)
• CT brain
• No old film for comparison
- MMSE 20/30 (week1)
  - Time: 2/5
  - Place: 3/5
  - Serial 7: 2/5
  - Recall: 2/3

Orientation
Attention
Calculation
Short term memory
<table>
<thead>
<tr>
<th>Status</th>
<th>Date</th>
<th>A/D/S/C</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>A-Alert D-Drowsy S-Stupor C-Coma</td>
<td>28/12</td>
<td>A/D/S/C</td>
<td>follow</td>
</tr>
<tr>
<td>1. Year/season/month/date/day</td>
<td>012345</td>
<td>2/3</td>
<td></td>
</tr>
<tr>
<td>2. Where are we?</td>
<td>012345</td>
<td>3/3</td>
<td>Man</td>
</tr>
<tr>
<td>3. Name 3 objects (Apple, Key, Train)</td>
<td>0123</td>
<td>2/2</td>
<td>Repeat</td>
</tr>
<tr>
<td>4. Serial 7</td>
<td>012345</td>
<td>2/2</td>
<td>Must</td>
</tr>
<tr>
<td>5. Ask for 3 objects: (In Q3)</td>
<td>0123</td>
<td>2/2</td>
<td>Repeat</td>
</tr>
<tr>
<td>6. Name a watch &amp; pencil</td>
<td>012</td>
<td>1/1</td>
<td>Must</td>
</tr>
<tr>
<td>7. Repeat a sentence</td>
<td>0123</td>
<td>2/2</td>
<td>Ready to repeat</td>
</tr>
<tr>
<td>8. Follow a 3 stage command</td>
<td>0123</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>9. Read &amp; obey instruction</td>
<td>01</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>10. Say a sentence</td>
<td>01</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>11. Copy design</td>
<td>Total / 30</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td>Secondary level</td>
<td>Tertiary level</td>
<td></td>
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</tbody>
</table>

Premarke: case ok, similar attitude
• Video
  • What is your age?
  • Animal naming
Delirium
- A sudden fluctuating and usually reversible disturbance of mental function
Confusional Assessment Method (CAM)

• 1: Acute Onset or Fluctuating Course
  • Acute change in mental status from baseline
  • Fluctuates during the day

• 2: Inattention
  • Easily distractible

• 3: Disorganized thinking
  • Unpredictable switching from subject to subject

• 4: Altered Level of consciousness
  
The diagnosis of delirium requires presence of 1 and 2 and either 3 or 4.
No documentation concerning mental state

MMSE: 20

Augmentin

Previous Adm x PTx

Index Adm

UTI

Day 6 post d/c

Oct 15th Dec 21st Dec
• ... Vascular Dementia?
  • Cardiovascular risk factors
  • Acute onset
  • Stepwise-progression
  • CT brain: Lacunar infarct
• Impression
  • Delirium ? on top of background Vascular Dementia

• DDx: ...Neurosyphilis?
  (VDRL: +ve, TPPA & EIA +ve )
History

• No known history of STDs / Previous Treatment
• Sexually inactive > 20 years
Physical Examination

- Speech: fluent
- CN intact
- Power 5/5
- Tone normal
- Reflexes normal
- Bilateral plantar down going
- No cerebellar signs
- No resting tremors

- Primitive reflex negative

- No Argyll Robertson pupils
- Romberg's Test: negative
- Proprioception normal
<table>
<thead>
<tr>
<th>Test Type</th>
<th>Specimen Type</th>
<th>Result</th>
<th>Validated By</th>
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<tbody>
<tr>
<td>Syphilis Serology</td>
<td>Specimen Type: EIA</td>
<td>Positive</td>
<td>Dr LAM Tin Keung, Edman</td>
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<td>Treponema pallidum</td>
<td></td>
<td></td>
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<td></td>
<td>Specimen Type: VDRL</td>
<td>Weakly reactive</td>
<td>Dr LAM Tin Keung, Edman</td>
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<td></td>
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<tr>
<td></td>
<td>Specimen Type: TPPA</td>
<td>Reactive 1+</td>
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Syphilis, Neurosyphilis, and the Olders
Syphilis

• A sexually transmitted disease
• *Treponema pallidum* (a spirochete)
History of Syphilis

- Unknown origins
  - ? New World - classic lesions in Aztec, Mississippian and Inca bones from 1000 to 3000 years ago
  - ? Carried from the New World to Europe after Columbus' voyages

- First recognized outbreak
  - 1494, in Naples, Italy - ravaged the army of Charles VIII of France

- Epidemic throughout Europe
- Five million deaths

- Early treatments: mercury, iodides, arsenical, suspension therapy, fever therapy induced from malaria...

- Until the introduction of penicillin in the 1950s
• Acquired Syphilis
  1) Primary
  2) Secondary
  3) Latent
  4) Tertiary
1) **Primary**: Chancre, Local LN

2) **Secondary**: Rash, Generalized LN, Ulcers, Alopecia, Systemic symptoms

3) **Latent**: Asymptomatic
   - Diagnosis based on *positive serological tests*

4) **Tertiary**
   1) Cardiovascular syphilis
   2) **Neurosyphilis**
   3) Gummatous syphilis *(benign tertiary syphilis)*

**Our Patient:**

Asymptomatic
Natural History of Syphilis

- Primary syphilis
  - 10 to 90 days (mean 21 days) after infected
  - Spontaneously subsided within 2-3 weeks

- Secondary syphilis
  - 4 to 10 weeks after onset of primary syphilis
  - Without treatment; may subside 3 to 12 weeks

- Latent Syphilis
  - Early latent
    - Arbitrary division of 1 year
  - Late latent
    - Asymptomatic, only seen in serology

- Tertiary
  - Neurosyphilis

- Neurosyphilis
  - meningovascular
  - general paralysis
  - tabes dorsalis
Neurosyphilis

a) Acute Syphilitic Meningitis

b) Meningovascular neurosyphilis

c) General paresis of insane (GPI)

d) Tabes dorsalis

e) Ocular syphilis
Meningovascular neurosyphilis

• 3-7 years after infection

• Stroke syndrome in a young adult
  • Middle cerebral artery (most common)
  • Branches of the basilar artery (second most common)

• Prodromes:
  • Headache, dizziness, or personality changes (days or weeks before the onset of ischemia or stroke)
General paresis of insane

• “Dementia paralytica”
• 20 - 30 years after infection

• A chronic progressive frontotemporal meningoencephalitis

• Forgetfulness
• Personality change
• Judgment problem
• Psychiatric symptoms: depression, mania, or psychosis.

PARESIS

- *Personality*
- *Affect*
- *Reflexes* (hyperactive)
- *Eye* (eg, Argyll Robertson pupils)
- *Sensorium* (eg, illusions, delusions, hallucinations)
- *Intellect* (eg, decreased recent memory, orientation, calculations, judgment, insight)
- *Speech*
- Typical Changes on MRI
  - Brain atrophy involving bilateral frontal and temporal lobes
  - Enlargement of bilateral ventricles
  - Multiple patchy lesions in the subcortical white matter, with long T-1 and T-2 signal intensity, more easily seen on FLAIR MRI

Tabes dorsalis

• 10-20 years or more after infection

• A disease of posterior columns and dorsal roots

  • Sensory ataxia (positive romberg’s, ataxic gait)
  • Lancinating pains (limbs, back or face)

• Paraesthesia
• Overflow incontinence
• Argyll Robertson pupils
• Optic atrophy
• Charcot's joints
Diagnosis of Neurosyphilis

- Clinical suspicion
- Serology + CSF
Syphilis Serology

• Serology
  • Non-treponemal antibody test (nonspecific)
    • VDRL (Venereal Disease Research Laboratory)
    • RPR (Rapid Plasma Reagin)
  • Treponemal test (specific, for diagnostic confirmation)
    • TP-PA (Treponema pallidum particle agglutination assay)
    • TP-EIA (Treponema pallidum enzyme immunoassay)
    • FTA-ABS (Fluorescent treponemal antibody absorption)

*False Positivity!*
False-positivity of VDRL

• Acute (< 6 months)
  • Pregnancy, other spirochaetal infections (leptospirosis, relapsing fever), viral infections (infectious mononucleosis, measles, chickenpox) or vaccinations (yellow fever, typhoid)

• Chronic (> 6 months)
  • Old age, chronic infection (leprosy, tuberculosis, malaria), autoimmune diseases (esp. SLE), intravenous abuser, malignancy
<table>
<thead>
<tr>
<th>Detect</th>
<th>Non-treponemal tests</th>
<th>Treponemal tests</th>
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</thead>
<tbody>
<tr>
<td>Non-specific treponemal antibody</td>
<td>VDRL, RPR</td>
<td>TPPA, EIA</td>
</tr>
<tr>
<td>Specific treponemal antibody</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titre</td>
<td>Titres usually <strong>correlate</strong> with <strong>disease activity</strong> (Semi-quantitative)</td>
<td>Titres <strong>not correlate</strong> with disease activity</td>
</tr>
<tr>
<td></td>
<td>Usually become <strong>nonreactive</strong> with <strong>time / after treatment</strong></td>
<td>** Remain reactive** regardless of treatment or disease activity</td>
</tr>
</tbody>
</table>
- VDRL: positive
  - Past or present infection with a *T. pallidum*

### Specimen Type

<table>
<thead>
<tr>
<th>VDRL</th>
<th>Clotted Blood</th>
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</thead>
<tbody>
<tr>
<td>Weakly reactive</td>
<td>= Titre ~ 1:1 – 1:2</td>
</tr>
</tbody>
</table>

#### Titre Ranges

<table>
<thead>
<tr>
<th>Titre</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1</td>
<td>Weakly Reactive: Antigen detected <em>only</em> in a more concentrated sample</td>
</tr>
<tr>
<td>1:2</td>
<td></td>
</tr>
<tr>
<td>1:16</td>
<td>“Strongly” Reactive: Antigen detected even in a <em>diluted</em> sample</td>
</tr>
<tr>
<td>1:32</td>
<td></td>
</tr>
</tbody>
</table>
• A VDRL titre of **1:16** and indicate **active disease** and the need for treatment

• Serology must be interpreted in the light of the treatment history and clinical findings

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Mr Chan:
- Latent Syphilis (? past infection, inactive disease)
• Neurosyphilis is unlikely in patients with late latent syphilis
• A negative serum VDRL rules out neurosyphilis

Wohrl S, Geusau A. Neurosyphilis is unlikely in patients with late latent syphilis and a negative blood VDRL Test. Acta Derm Venereol 2006;86:335–9

• A serum RPR $\geq 1:32$ has been demonstrated to predict Neurosyphilis (by CSF abnormalities)

When to do Lumbar Puncture

• CDC guideline 2010
  • LP to be performed in the clinical settings of:

  a) Development of **neurological** or **ophthalmic** findings (e.g. uveitis) in patients with primary or secondary syphilis
  b) Evidence of **active tertiary** syphilis
  c) Treatment failure
  d) Concurrent **HIV** infection with late latent syphilis (or syphilis of unknown duration)
  e) Newborns with syphilis
# Symptoms

<table>
<thead>
<tr>
<th>Neurological</th>
<th>Ophthalmic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive dysfunction</td>
<td>Syphilitic uveitis</td>
</tr>
<tr>
<td>Motor / Sensory Deficit</td>
<td></td>
</tr>
<tr>
<td>Cranial nerve palsies</td>
<td></td>
</tr>
<tr>
<td>Symptoms / signs of Meningitis</td>
<td></td>
</tr>
</tbody>
</table>
Findings of CSF in Neurosyphilis

- Lymphocytes > 5/mm3
- Protein > 0.4 gm/l
- CSF serology:
  - VDRL (negative in > 1/4 neurosyphilis)
  - FTA or TPHA (negative test excludes neurosyphilis)
Treatment

• **Parenteral penicillin** is the drug of choice in all stages of syphilis

• Documented efficacy in **neurosyphilis**, syphilis during pregnancy and congenital syphilis.

• Different dosage and regime for different stages of disease
Our patient

• Vascular Dementia vs Neurosyphilis?
<table>
<thead>
<tr>
<th></th>
<th>Vascular Dementia</th>
<th>General Paresis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
<td>Abrupt</td>
<td>Insidious</td>
</tr>
<tr>
<td><strong>Deterioration</strong></td>
<td>Stepwise</td>
<td>Progressive</td>
</tr>
<tr>
<td><strong>Physical Examination</strong></td>
<td>e.g. Localizing signs, Gait</td>
<td>e.g. Argyll R Pupils</td>
</tr>
<tr>
<td><strong>Imaging</strong></td>
<td>SVD Infarcts</td>
<td>Frontal- Temporal involvement</td>
</tr>
</tbody>
</table>

Infarcts: Frontal- Temporal involvement
Things have changed...

Preantibiotic era

• **Neurosyphilis WAS** common
  • 25 - 35% of patients with syphilis has neurosyphilis
    (1/3: tabes dorsalis, 1/10 GPI, 1/10 meningovascular)
  • GPI accounted for **10%** admissions to psychiatric hospitals
Things have changed...

**Current era**
- Early >>> Late neurosyphilis
- Most frequently seen in patients with human immunodeficiency virus (HIV) infection

• Frequency of general paresis and tabes dorsalis has markedly declined in the antibiotic era

• Partly due to the widespread use of antibiotics for unrelated illnesses

• Time between infection and neurosyphilis is around 20 years or more

• Widespread use of antibiotics (i.e. exposure to penicillin)
VDRL in older patient

**VRDL**

- **Sensitivity:**
  - Becomes nonreactive in 25% of late syphilis

- **Specificity:**
  - 16% of positive VDRL are patients with other diseases

VDRL in older patient

- Age: 10% older patient of age 70 or older have a low titer false-positive VDRL test. 

Neurosyphilis and Dementia

• Neurosyphilis is a rare complication of syphilis that occurs in about 7% of patients with untreated syphilis\(^1\)

• Even among patients with neurosyphilis, dementia is an uncommon manifestation\(^2\)

• A demented patient with abnormal VDRL results having dementia due to neurosyphilis is 2%.

Christopher Frank, Dementia workup - Deciding on laboratory testing for the elderly, *Can Fam Physician* 1998;44:1489-1495.
Benefits and Risks (1)

- Early detection and treatment
- Prevents complications
- Reduces transmission risk
- Antibiotic treatment for syphilis is effective and inexpensive.

- Benefits of screening persons at increased risk for syphilis infection substantially outweigh the potential harms.

Benefits and Risks (2)

Potential ones:
- Partner discord
- Stigma
- Unnecessary anxiety or treatment (false-positive result)
- Opportunity costs (time and resources of clinician and patient)

- Allergic reaction to penicillin
- Side effects: e.g. Jarisch-Herxheimer reaction

Interview with Son, Verbatim

• 很錯愕... 我們幾兄弟姐妹有意識以來這麼多年，都不知道爸爸有這樣的事（指梅毒）。

（母親反應如何？）

• 她也年事已高，我們沒有多作特別的解釋，因為不知道她會如何反應，也不知能理解得多少。不過無論如何，已安排她和爸爸到衛生科（意指SHC）繼續跟進。
When to Check?
1.4.2 Investigation

1.4.2.1 A basic dementia screen should be performed at the time of presentation, usually within primary care. It should include:
- routine haematology
- biochemistry tests (including electrolytes, calcium, glucose, and renal

Testing for syphilis serology or HIV should not be routinely undertaken in the investigation of people with suspected dementia. These tests should be considered only in those with histories suggesting they are at risk or if the clinical picture dictates.

1.4.2.3 A midstream urine test should always be carried out if delirium is a possibility.

1.4.2.4 Clinical presentation should determine whether investigations such as chest X-ray or electrocardiogram are needed.

1.4.2.5 Cerebrospinal fluid examination should not be performed as a routine investigation for dementia.
2.3 SCREENING FOR COMORBID CONDITIONS

It is good practice to screen for coexisting medical conditions that are common in older people and for potential causes of dementia at first presentation.

Reversible causes of dementia, for example, due to hypothyroidism and vitamin B₁₂ deficiency are very rare (less than 1%) and very few cases of reversible or partially reversible dementia have been reported in the literature to date.

There is no evidence that routine batteries of laboratory tests improve the accuracy of the clinical diagnosis of dementia, nor is there evidence for the routine use of genetic markers or syphilis serology to increase the predictive value of a diagnosis.⁷,¹³,¹⁴

Physical investigations including laboratory tests should be selected on clinical grounds according to history and clinical circumstances.

People with depression and cognitive impairment are highly likely to have dementia diagnosed during longitudinal follow up and that 12% of people with dementia were also depressed.⁷ A cohort study found that depression is often part of a dementia prodrome.¹⁷

As part of the assessment for suspected dementia, the presence of comorbid depression should be considered.
American Geriatrics Society

• **Laboratory Testing**
  
  – Complete blood cell count, thyroid-stimulating hormone, B₁₂, folate, serum calcium, liver and kidney function tests, electrolytes
  
  – Serologic test for syphilis (selectively)
  
  – Glucose and HIV for patients at risk
  
  – Genetic testing and “Alzheimer blood tests” are not currently recommended for clinical use.

  – **Seroologic test for syphilis (selectively)**

  – Glucose and HIV for patients at risk

  – Genetic testing and “Alzheimer blood tests” are not currently recommended for clinical use.
Our Patient

- **Problem List**
  - Prolonged Delirious state
  - Background of Vascular Dementia, BPSD+
  - Latent syphilis

- Caring problem
• Progress (After haldol)
  • Still cannot take shower, brush teeth
  • Time and place disorientention
  • More settled in ward
- Another delirious period
  - Hospital Acquired Pneumonia
  - SIADH with hyponatraemia (Na ~ 120)

- Out of delirium when physical condition stabilized

- Functional status remains static

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<td>Sodium</td>
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<tr>
<td>Potassium</td>
<td>4.4</td>
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<tr>
<td>Urea</td>
<td>5.3</td>
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<tr>
<td>Creatinine</td>
<td>89</td>
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No documentation concerning mental state

MMSE: 20
MoCA: 15
Augmentin
Haldol
Tazocin

Oct 15th Dec

Previous Adm x PTx

21st Dec  Wk 3

Index Adm

UTI

Wk 6

Pneumonia Hyponatriaema
• Video:
  • Judgement:

  “What would you do if you saw a boy screaming for help in the pond?”

• Newspaper reading
• MoCA 15/30 (<= 11/30)
Naming

- Lion
- Rhino
- Camel
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<th>讀出詞語再由病者重複</th>
<th>面孔</th>
<th>絲絨</th>
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<td></td>
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<td>第二次嘗試</td>
<td>[ ]</td>
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<td>專注</td>
<td>讀出數字 (每秒一個)</td>
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<td></td>
<td></td>
<td>病者須把數字向後重複 [ ] 7 4 2</td>
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<td>讀數字: 當數字 '1' 出現時病者必須用手指敲打桌面 (如≥2錯誤便不給予分數)</td>
<td></td>
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<td></td>
<td>[ ] 5 2 1 3 7 4 1 8 0 6 2 1 5 1 7 4 5 1 1 1 4 1 7 0 5 1 1 2</td>
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<tr>
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<td>一分鐘內能說出的動物名稱的數目</td>
<td>[ ] (N ≥ 11 個名稱)</td>
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</table>

<table>
<thead>
<tr>
<th>抽象</th>
<th>相似點: 例如: 香蕉 - 橙 = 生果</th>
<th>[ ] 火車 - 單車</th>
<th>[ ] 手錶 - 間尺</th>
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<table>
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<tr>
<th>延遲記憶</th>
<th>須回憶詞語不可給提示</th>
<th>面孔</th>
<th>絲絨</th>
<th>教堂</th>
<th>雛菊</th>
<th>紅色</th>
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<tbody>
<tr>
<td></td>
<td>分數只授予沒有提示的正確回憶</td>
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<th>定向</th>
<th>[ ] 日</th>
<th>[ ] 月</th>
<th>[ ] 年</th>
<th>[ ] 星期</th>
<th>[ ] 地點</th>
<th>[ ] 地區</th>
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</tbody>
</table>

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Hong Kong version 26 May 2008
Translated by Wong A and Mok V
• Pending MRI (2014)

• Discharged to OAH (temporarily)
  • Wife’s recent accidental head injury in China

• Long term care plan
  • Home care
  • Pending maid in a few months
Bring Home Message

• Treat the patient, not the laboratory results

• Think twice before ordering a test
The End