

# **'SMART PAPERS' – TOOLS TO AID CLINICAL PRACTICE**

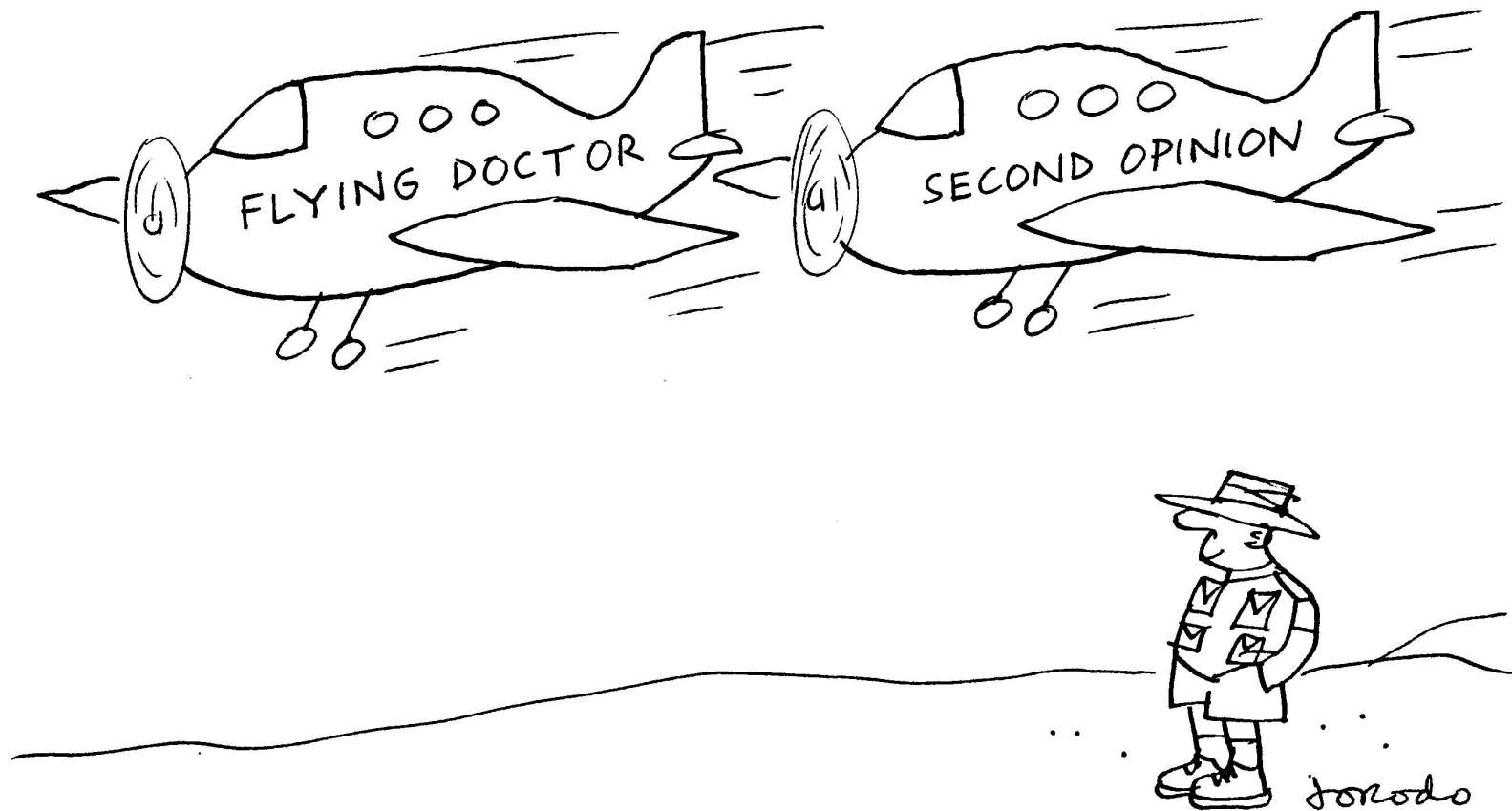
**Tuesday Oct 23, 2012**

**Clinical Human Factors Group. Addenbrooke's, Cambridge**

**Narinder Kapur**

**Consultant Neuropsychologist**

**University College London. [n.kapur@ucl.ac.uk](mailto:n.kapur@ucl.ac.uk). [www.abetternhs.com](http://www.abetternhs.com)**



# Diagnostic Errors—The Next Frontier for Patient Safety

---

David E. Newman-Toker, MD, PhD

---

Peter J. Pronovost, MD, PhD

---

**D**URING THE PAST DECADE, AWARENESS AND UNDERSTANDING of medical errors have expanded rapidly, with an energetic patient safety movement promoting safer health care through “systems” solutions. Efforts have focused on translating evidence into practice, mitigating hazards from therapies, and improving culture and communication. Diagnostic errors have received relatively little attention. Although the science of error measurement is underdeveloped, diagnostic errors are an important source of preventable harm.<sup>1,3</sup> In this Commentary, we offer definitions for diagnostic error and misdiagnosis-related harm, present an overview of the magnitude of diagnostic errors, and give suggestions for how research can mature.

## Distinguishing Errors From Harms

In considering diagnostic errors, it is important to distinguish between the error (a process) and the resulting harm (an outcome). *Diagnostic error* can be defined as a diagnosis that is missed, wrong, or delayed, as detected by some subsequent definitive test or finding.<sup>1</sup> However, not all misdiagnoses result in harm, and harm may be due to either disease or intervention. *Misdiagnosis-related harm* can be defined as preventable harm that results from the delay or failure to treat a condition actually present (when the working diagnosis was wrong or unknown) or from treatment provided for a condition not actually present.

An estimated 40 000 to 80 000 US hospital deaths result from misdiagnosis annually.<sup>4</sup> Roughly 5% of autopsies reveal lethal diagnostic errors for which a correct diagnosis coupled with treatment could have averted death.<sup>5</sup> In the Harvard Medical Practice Study, physician errors resulting in adverse events were more likely to be diagnostic than drug-related (14% vs 9%), and misdiagnoses were more likely to be considered negligent (75% vs 53%) and to result in serious disability (47% vs 14%).<sup>6</sup> Not surprisingly, tort claims for diagnostic errors are nearly twice as common as claims for medication errors and result in the largest payouts.<sup>7</sup> As with all types of medical error, the human toll of misdiagnosis on an individual or family can be tremendous, particularly when a healthy patient experiences an adverse event.

Diagnostic errors often are unrecognized or unreported, and the science of measuring these errors (and their effects) is underdeveloped.<sup>1,2</sup> Available statistics consider neither deaths due to misdiagnosis in outpatients nor misdiagnosis-related morbidity and associated costs. For example, stroke, the leading cause of serious, long-term disability in the United States, affects 780 000 Americans annually.<sup>8</sup> Opportunities to prevent disabling stroke are missed when patients experiencing mild or transient warning symptoms receive misdiagnoses. According to a recent systematic review, 9% of all cerebrovascular events are missed initially, and the odds of misdiagnosis increase at least 5-fold when symptoms are mild or transient.<sup>9</sup>

---

**Author Affiliations:** Departments of Neurology (Dr Newman-Toker) and Anesthesiology and Critical Care (Dr Pronovost), Johns Hopkins University School of Medicine, Baltimore, Maryland.

**Corresponding Author:** David E. Newman-Toker, MD, PhD, The Johns Hopkins Hospital, Pathology Bldg 2-210, 600 N Wolfe St, Baltimore, MD 21287 (toker@jhu.edu).

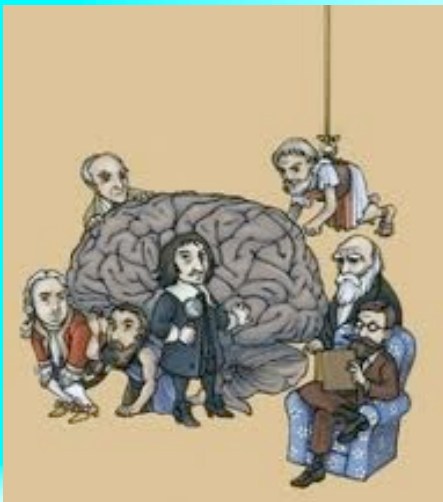
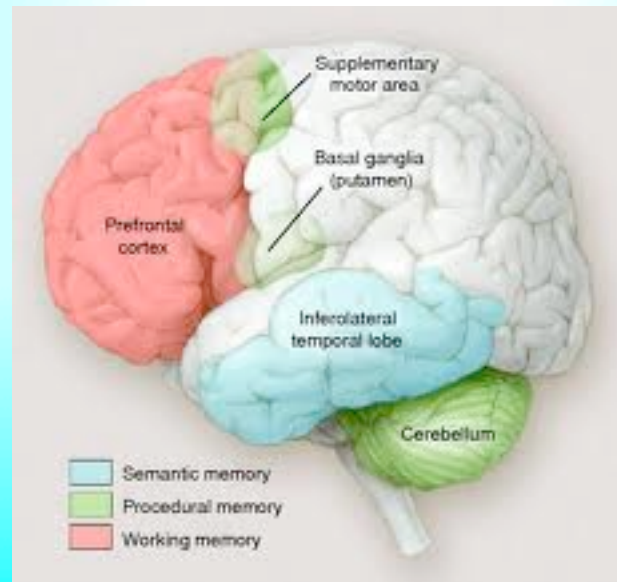
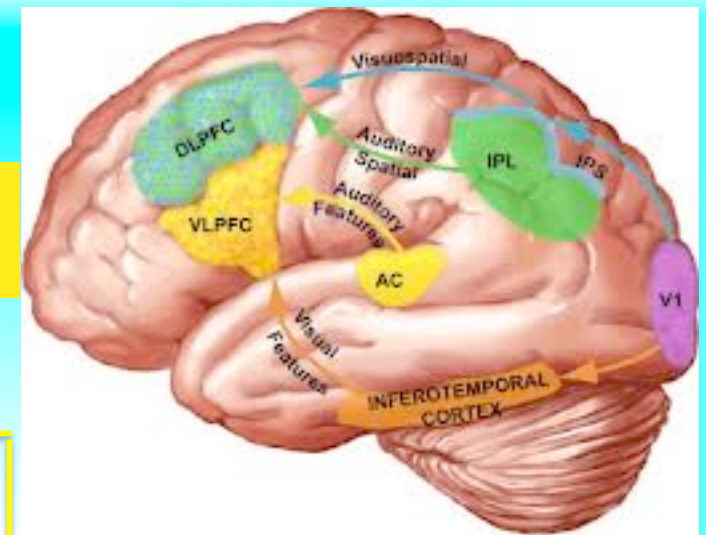
# **Diagnostic Errors in Clinical Practice**

**From – Croskerry 2009, *Patient Safety in Emergency Medicine***

1. 'Clinical decision making is the most important characteristic of a physician's performance in the Emergency Department
2. Two central biases – failure to adequately consider alternative options; favouritism towards initially selected possibilities
3. Cognitive and affective dispositions to respond may result in important departures from rationality and significantly impact patient safety'



## External Attentional System – see, hear, touch, smell



Internal Attentional System – Many patient safety cognitive errors are due to failures of the internal attentional system



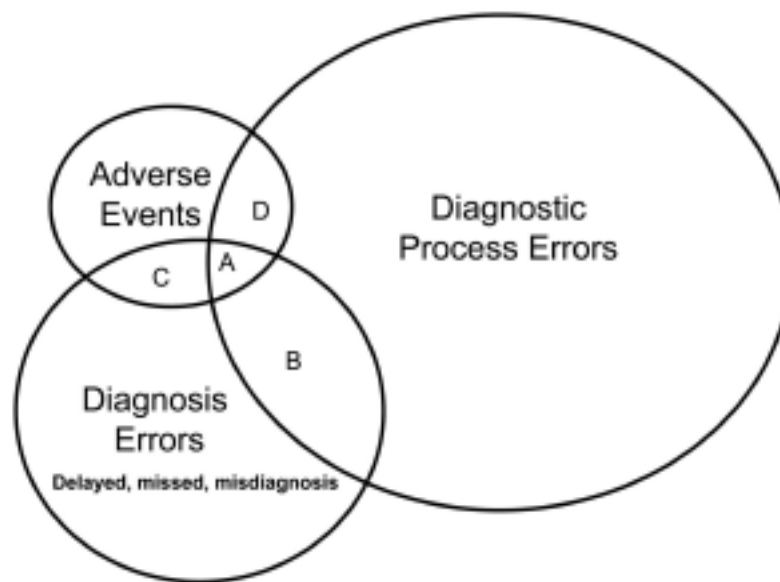
# How Neurologists Think

## A Cognitive Psychology Perspective on Missed Diagnoses

Barbara G. Vickrey, MD, MPH,<sup>1,2</sup> Martin A. Samuels, MD,<sup>3</sup> and  
Allan H. Ropper, MD<sup>3</sup>

Physicians use heuristics or shortcuts in their decision making to help them sort through complex clinical information and formulate diagnoses efficiently. Practice would come to a halt without them. However, there are pitfalls to the use of certain heuristics, the same ones to which humans are prone in everyday life. It may be possible to improve clinical decision making through techniques that minimize biases inherent in heuristics. Five common clinical heuristics or other sources of cognitive error are illustrated through neurological cases with missed diagnoses, and literature from cognitive psychology and medicine are presented to support the occurrence of these errors in diagnostic reasoning as general phenomena. Articulation of the errors inherent in certain common heuristics alerts clinicians to their weaknesses as diagnosticians and should be beneficial to practice. Analysis of cases with missed diagnoses in teaching conferences might proceed along formal lines that identify the type of heuristic used and of inherent potential cognitive errors. Addressing these cognitive errors by becoming conscious of them is a useful tool in neurologic education and should facilitate a career-long process of continuous self-improvement.

ANN NEUROL 2010;67:425–433



**Figure 1** Venn diagram illustrating relationships between diagnostic process errors, delayed diagnoses/misdiagnoses, and adverse outcomes. Group A: Adverse outcome resulting from error-related misdiagnosis (e.g., pathology specimens erroneously mixed up [diagnostic process error], resulting in wrong patient being given diagnosis of cancer [misdiagnosis], who then undergoes surgery with adverse outcome [adverse event]). Group B: Delayed diagnosis or misdiagnosis due to process error (e.g., positive urine culture overlooked, thus urinary tract infection not diagnosed, but patient has no symptoms or adverse consequences). Group C: Adverse event due to misdiagnosis, but no identifiable process error (e.g., death from acute myocardial infarction, but no chest pain or other symptoms that were missed). Group D: Harm from error in diagnostic process (e.g., colon perforation from colonoscopy done on wrong patient), but no misdiagnosis.

## Relating Faults in Diagnostic Reasoning With Diagnostic Errors and Patient Harm

Laura Zwaan, MSc, Abel Thijs, MD, PhD, Cordula Wagner, PhD, Gerrit van der Wal, MD, PhD, and Daniëlle R.M. Timmermans, PhD

---

### Abstract

#### Purpose

The relationship between faults in diagnostic reasoning, diagnostic errors, and patient harm has hardly been studied. This study examined suboptimal cognitive acts (SCAs; i.e., faults in diagnostic reasoning), related them to the occurrence of diagnostic errors and patient harm, and studied the causes.

#### Method

Four expert internists reviewed patient records of 247 dyspnea patients, using a specially developed questionnaire to detect SCAs. The patients were treated by 72 physicians between May 2007 and February 2008 in five Dutch hospitals.

The findings of the record review were discussed with the treating physicians, and the causes of SCAs were classified using Reason's taxonomy of unsafe acts. Statistical analyses were performed with descriptive statistics and independent *t* tests to compare groups. Furthermore, a reliability study was conducted to assess the interrater reliability.

#### Results

SCAs occurred in 163 of 247 cases reviewed (66%). In 34 (13.8%) of all cases, a diagnostic error occurred, and in 28 (11.3%) cases, the patient was harmed. Cases with diagnostic errors or patient harm had more SCAs. However,

in 10 (4.0%) of the cases, diagnostic errors or patient harm occurred, though there were no SCAs. The causes of SCAs were mostly mistakes (i.e., the planned action was incorrect).

#### Conclusions

In cases with more SCAs, diagnostic errors and patient harm occurred more often, suggesting that the number of SCAs per case was predictive of the occurrence of these events. The most common causes were mistakes, meaning that physicians did not realize their actions were incorrect.

---

## Checklists to Reduce Diagnostic Errors

John W. Ely, MD, Mark L. Graber, MD, and Pat Croskerry, MD, PhD

---

### Abstract

Diagnostic errors are common and can often be traced to physicians' cognitive biases and failed heuristics (mental shortcuts). A great deal is known about how these faulty thinking processes lead to error, but little is known about how to prevent them. Faulty thinking plagues other high-risk, high-reliability professions, such as airline pilots and nuclear plant operators, but these professions have reduced errors by using checklists. Recently, checklists have gained acceptance in medical settings, such as operating rooms and intensive

care units. This article extends the checklist concept to diagnosis and describes three types of checklists: (1) a general checklist that prompts physicians to optimize their cognitive approach, (2) a differential diagnosis checklist to help physicians avoid the most common cause of diagnostic error—failure to consider the correct diagnosis as a possibility, and (3) a checklist of common pitfalls and cognitive forcing functions to improve evaluation of selected diseases. These checklists were developed informally and have not been subjected to rigorous

evaluation. The purpose of this article is to argue for the further investigation and revision of these initial attempts to apply checklists to the diagnostic process. The basic idea behind checklists is to provide an alternative to reliance on intuition and memory in clinical problem solving. This kind of solution is demanded by the complexity of diagnostic reasoning, which often involves sense-making under conditions of great uncertainty and limited time.

---



SPECIAL ARTICLE

## A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

Implementation of the checklist was associated with concomitant reductions in the rates of death and complications among patients at least 16 years of age who were undergoing non-cardiac surgery in a diverse group of hospitals.

Haynes A et al. (2009). *New England Journal of Medicine*, **360**: 491-9.

# Surgical Safety Checklist



World Health  
Organization

Patient Safety

A World Alliance for Safer Health Care

## Before induction of anaesthesia

(with at least nurse and anaesthetist)

**Has the patient confirmed his/her identity, site, procedure, and consent?**

☐ Yes

**Is the site marked?**

☐ Yes

☐ Not applicable

**Is the anaesthesia machine and medication check complete?**

☐ Yes

**Is the pulse oximeter on the patient and functioning?**

☐ Yes

**Does the patient have a:**

**Known allergy?**

☐ No

☐ Yes

**Difficult airway or aspiration risk?**

☐ No

☐ Yes, and equipment/assistance available

**Risk of >500ml blood loss (7ml/kg in children)?**

☐ No

☐ Yes, and two IVs/central access and fluids planned

## Before skin incision

(with nurse, anaesthetist and surgeon)

☐ **Confirm all team members have introduced themselves by name and role.**

☐ **Confirm the patient's name, procedure, and where the incision will be made.**

**Has antibiotic prophylaxis been given within the last 60 minutes?**

☐ Yes

☐ Not applicable

**Anticipated Critical Events**

**To Surgeon:**

☐ What are the critical or non-routine steps?

☐ How long will the case take?

☐ What is the anticipated blood loss?

**To Anaesthetist:**

☐ Are there any patient-specific concerns?

**To Nursing Team:**

☐ Has sterility (including indicator results) been confirmed?

☐ Are there equipment issues or any concerns?

**Is essential imaging displayed?**

☐ Yes

☐ Not applicable

## Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

**Nurse Verbally Confirms:**

☐ The name of the procedure

☐ Completion of instrument, sponge and needle counts

☐ Specimen labelling (read specimen labels aloud, including patient name)

☐ Whether there are any equipment problems to be addressed

**To Surgeon, Anaesthetist and Nurse:**

☐ What are the key concerns for recovery and management of this patient?

# Evidence-Based Guidelines / Check-Lists

1. We need them because of the fallibility of the human mind, especially the frailties of our semantic memory / knowledge retrieval system, and also because of the fallibility of equipment and systems in health-care settings
2. Evidence itself needs to be sound and to relevant to clinical case in question
3. The judgement of the clinician in interpretation and use of evidence is a critical factor
4. The needs of the patient and his family, and relevant compliance factors, may influence how evidence-based guidelines are implemented

# Main Purpose of Smart Papers

1. Help you decide what questions to ask
2. Help you interpret the answers to questions
3. Help you decide what tests to carry out
4. Help you interpret the results of tests
5. Help you decide on how to treat the patient
6. Help you decide what to say to the patient and his/her family



<b>CLINICAL DETAILS</b>	Medical Screening cardiac, blood pressure cholesterol, arthritis		Neurological Screening birth/milestones, head injury, epilepsy, loss of consciousness, funny turns. Check for <del>ictal</del> /post- <del>ictal</del> amnesia.		<b>COGNITION, EMOTION &amp; MOTIVATION</b>		Concentration Gives up or is distracted easily. Daydreams. Difficulty driving & talking. Flips between tasks. Falls <del>asleep</del> watching TV. Mind wanders during reading, group conversation. Goes off at tangent in a conversation.		Speech <del>Word-finding</del> – high frequency words, getting stuck OR word substitutions, transient, effect of cues. Off on tangent. Articulation. Speech <del>comprehension</del> .		
	Sleep, Tiredness.		Psychiatric Screening Taken anti-depressants, seen psychiatrist. Recent stressful life events, family history.				Family History of Neurological Disease		Current medication –		
Change in food <del>prefs</del> , Alcohol abuse, illicit drugs	Memory <del>frequency</del> , <del>severity</del> , change, ADL		Repeatedly asks what day it is		Repeats self often – several times in an hour		Forgets where items are normally kept at home		Memory difficulties when reading books or watching TV		Other Language Reading Writing Spelling
	Forgets deaths of family/friends, pets, people in news. Forgets holidays.		<del>Uncharacteristic</del> , <del>difficulty in learning</del> , <del>new gadgets/pieces of</del> , <del>equipment</del>		<del>Frequent difficulty in</del> , <del>navigating in familiar</del> , <del>localities</del> . If wakes up at <del>night confuses rooms</del>		Frequent problems learning new routes, way back to or within hotel, where car parked		Due to memory, cannot now do things did before - ADL, job, hobbies, DIY.		
Headache, Backache, Tummy ache											
<b>INSTRUMENTAL ACTIVITIES OF DAILY LIVING &amp; EXECUTIVE FUNCTION</b>	Hobbies, interests, music, sports, achievements, holidays					Education – reading-writing problems, best subjects Media exposure (TV, radio, papers, internet)					
	Occupation (first, best, last) Premorbid Strengths / Weaknesses										Vision. Hearing. Acuity/glasses Neglect Read clock
	Medical & Psychiatric History. Happy childhood?			Family History			R-L Hand		Reading Glasses		
	Early Symptoms: _____ Duration: _____ Change over time: _____										Calculating Skill
Occupational Adjustment Technical, dealing with people, stressful events. Learning new routines, evidence from superiors or colleagues.	What would you like to get out of this appointment?					CARER - What would you like to get out of this appointment?					Motor – apraxia, <del>coordination</del> (bra, tie)
											Reality Distortion Hallucinations/confab Eyes or ears play tricks...(things, people, animals). Delusions.
Family setting & adjustment. Social – friends.											Depressed - Feels sad. Tired. Libido down. Slow, poor <del>concept</del> . Eating/drinking change Sleep disturbed, sleeps during day. Suicidal. Indecisive. <del>vs</del> about past, future. Tearful. <del>a.m.</del> worse. Lost interest in things.
Driving & related Accidents/near acid. Recall parked car. Navigating familiar & unfamiliar routes. Read map.											
Cooking & for several people. Leaves equipment on. Knows where things are kept.											Motivation Past hobbies/pastimes Hygiene, cleanliness Cooking, garden Arousal Level

Change in ability to use TV, DIY equipment, kitchen appliances						Tolerance level Verbal - anger Physical - aggression
Make/answer phone calls. Use all features of mobile phone.						Anxiety Panic Attacks Chronic Anxiety
Use of computer, <u>internet</u> , email						<del>Disinhibition</del> Verbal, social, financial, toilet, sexual.
Shopping – memory for what to get						
Shopping – knows where items are in supermarket						<del>Obsessionality/ Stereotyped Behaviour</del> Obsessional thinking/ruminations
Handling coins, bills, bank accounts						
Eating habits and preferences. Table manners.						Has v high standards
Bath, shower, <u>shave</u> , make-up.						Emotional <del>Lability</del> Spontaneous/cued
Dressing - ability, appropriate	THREE KEY POINTS FOR ORGANIC MEMORY LOSS – (1) Frequent repetition most days (2) Navigation problems (3) Can exclude poor concentration, sleep-fatigue, medical conditions, stress					Worried Well – What it is not. What it is. How symptoms arise. 'Good news is that because brain is physically intact, things can be done'...
Error of judgement when buying items, responding to offers, gambling	Which doctors seen before – names, when, content of <u>appt.</u> <u>Medication</u>	What time left home to come to <u>appt.</u> What had for supper yesterday <u>evening</u> . Scans, etc – when & am/pm, who else there.	Recent holidays/trips – when, incidents-events from episode or journey to/from.	Ages – self, spouse, children, grand-children (& names)	Day Month Year (Date)	
Solving DIY problems at home	Provide names of personalities who have died or places in news....ask if familiar, and for details -					Effects of fatigue, stress, <u>hypervigilance</u> , pain. How states of mind > physical <u>symp.</u>
Remembering birthdays, anniversaries	Reading books - ask for title, author, content of current book or last one read -					
Studying, if appl.	Details of TV programme watched in past few days (if <u>poss.</u> with carer) - Prime Minister, Leader of Opposition - Name Queen's children. Charles' partner & children -					Software-hardware, car / piano out of tune
Hobbies, sports, gardening, interact with children.	Plan/take holidays. Deal with flights, navigation, <u>hotels</u> , currency, etc.	After poor performance ask about concentration during testing	EMPATHY - I see you are worried about...I hear what you are saying...I understand how you are feeling...I myself have had symptoms like that.	Anger – S.T.O.P. Stop. Think. Other Perspectives. Other Possible actions.		Problem Solving – S.T.O.P. Stop Think Organize task into Parts
Send Xmas Cards (people knowledge)	Refrain, Reframe, Remove mentally/physic	'Done well' to be Patient, Positive, Persevere....continue like this. Encourage patient that they can control some key symptoms, praise for control in the past.				

# SmartPaper - Psychological v NEUROLOGICAL [- Background -, Concomitant, Cognitive, Scores]



Psychological - Clinical Features	Indifference to cognitive limitations (i.e. the absence of major frontal pathology).	Complaints of jumbled, speeded, or slowed thinking. Focused on minutiae of symptoms to an obsessional degree. Presents a written list of symptoms.	Patient is more concerned about cognitive symptoms than partner	Symptoms related to poor concentration - e.g. put milk in cupboard, not know what went into room for, wash clean plate, lose glasses, leave tap on, leave key in front door	Recalls well items such as drug regime, dates of past hospital appointments, names of clinical staff, journey to hospital, recent visit to restaurant, how spent last birthday/Xmas, etc (verify). Can give detailed medical history, including names of professionals seen; day, time, content and duration of appointment; details of medication; scans undergone.	Cognitive symptoms occur in parallel with mood state, tiredness, pain or other physical symptoms
Many 'don't know', hesitant, delayed answers during interview testing	Confabulations that consist of boasting. Refuses to do tests.	Anxiety-related behaviour during interview (e.g. poor eye contact)	Patient reports concentration worse than memory, or there is evidence that memory difficulties are due to poor concentration. Memory varies with interest in item. Cognitive symptoms variable with completely normal functioning on some days.			Cognitive decline parallels specific life events, with sudden onset related to specific emotional precipitant
Perfectionist/sets self very high standards	Evidence of depression/anxiety - e.g. early morning waking, negative self-image, tearfulness, night sweats, weight loss/gain, change in urinary/bowel habits. Feelings of worthlessness. Preoccupation with death. Reduction in libido. 'Life is a struggle'. Sleep disturbed. Change in eating/drinking habits due to mood. Fatigue. Apathy. Suicidal ideation.	Dense autobiographical amnesia that includes loss of childhood memories. Admits to 'blanks' in past memories. Selective loss of emotionally traumatic memories.	Complains of memory problems but - understands and follows films/plays/ soap operas; can easily learn tasks that involve assimilating new information/new instructions or rules.			Loss of personal semantic memory (e.g. name, <del>C.O.B.</del> , signature, name of spouse, long-standing facts - e.g. address)
Slow and lacking confidence when making decisions						
Multiple somatic symptoms - <del>tiredness</del> , syncope, headache, backache, <del>tummy</del> ache, dizziness	Hysteria v Malingering - Personal more than public memories affected in hysteria - <del>e.g.</del> <del>personally</del> familiar faces, personal rather than matched public events. In malingering, more contrast with ADL adjustment. Lower cognitive test scores in malingering. If low test scores in hysteria, due to poor attention secondary to preoccupation with symptoms. Hysterics more cooperative in interview/testing. Somatoform hysterics have thicker case note files!			Cognitive symptoms worse in the morning in depression	Cannot recognise as familiar faces of family members	Loss of ability to perform well-established 'everyday skills' - e.g. brushing teeth, 'forgets how to breathe'.
Easily suggestible to plausible symptoms - e.g. Flashing coloured shapes on awakening						<b>Psychological - Test Performance</b>
Psychotic symptoms - intrusive thoughts, people know what you are thinking/doing, auditory hallucinations						Shows discrepancy between performance <del>on</del> cognitively similar tests.
Anxiety due to family history of brain illness. Become more introspective or self-critical recently						Chance or below-chance performance <del>on</del> recognition memory tests. Impaired on implicit memory tests. Test performance discordant with clinical history and ADL.
Sensitive to noise and crowds. Overwhelmed by visitors.						Performs well on difficult memory tests, and on timed perceptual-motor tests (Digit-Symbol, Trail-Making Test, etc).
- Stress in marriage or relationship with children. Recent bereavement -						Poor immediate recall with <del>better</del> <del>better</del> delayed recall
- Secondary gain for neuropsychological disability. Family history of psychiatric illness -						Better at recall than recognition memory tests
- < 50 years of age -						Discrepancy between test profile and brain imaging findings
- Excessive work-load/multi-tasking since onset of cognitive symptoms -						Unwilling to persist, but if encouraged succeeds in particular test.
- History of psychiatric consultations, psychotropic medication, stressful life events, crime, drug/alcohol abuse -						



NEUROLOGICAL - Clinical Features					NEUROLOGICAL - Test Performance
Concern from family/work-colleagues.					<u>Cannot give correct day, month, year, age, PM.</u>
Difficulty in following plots in films/soaps.					<u>Hayling, Backward span, Trails A, Fluency down more in ETD-E cfd to psy.</u>
Difficulty in assimilating what is read – keeping track of characters, plot. Cannot name title/author of book currently being read.					<u>Evidence of aphasia, apraxia or agnosia.</u>
Difficulty navigating familiar routes. <u>Has recently had car accidents.</u>					<u>Impaired on 'stress free' cognitive tasks (e.g. draw a clock, picture recognition memory)</u>
Difficulty learning new routes after several journeys.					<u>Shows impaired performance on several recognition memory tests.</u>
Cannot recollect major autobiographical events from the last few years (e.g. holidays, hospital treatments, deaths of family members), even after being provided with cues. May watch film twice with no earlier recall.					<u>Semantic category fluency worse than letter fluency.</u>
In hotel, <u>difficulty learning</u> location of dining room, way back to hotel. Cannot recall where items are kept in supermarket, where items belong at home – e.g. where things go in the kitchen.					<u>Marked drop from immediate to delayed recall. Recall not helped by cues. Zero immediate recall – giving a further presentation trial and test trial does little to improve performance.</u>
	If patient is unaccompanied to clinic, and partner is available on phone, get permission to ring partner, perhaps during break in testing. Slight atrophy on scan not helpful...in focal dementia, SPECT scan may be informative if other scans equivocal.				<u>Impaired on Luria 3-step command and alternating sequence command.</u>
	Six components of Cognitive Commitment/Cognitive Effort – [Encoding] 1. I can't pay attention. 2. I don't care about paying attention. 3. I will deliberately not pay attention/misinterpret. [Retrieval] 4. I can't concentrate on responding. 5. I don't care how I respond. 6. I am deliberately going to perform in a suboptimal fashion.				
No knowledge of <u>recent</u> deaths of <u>famous</u> personalities, or deaths of relatives/friends.	Assuming that there are no other reasons for so doing, repeats same story or frequently asks same question. May also apply to actions, such as buying things, eating a meal again.	Cooking for several people is more difficult than before, omits ingredients from recipes, leave kitchen equipment on, etc.	Utilisation behaviour, frontal lobe reflexes, perseveration, echolalia; visual hallucinations, incontinence, ataxia, <u>micrographia</u>	Impaired in organizing holidays, birthdays parties, sending Xmas cards.	
Perseveration & impulsivity. Difficulty in following / retaining test instructions.	Difficulty in following conversations, losing thread of own or others' comments. Remarks inappropriate to context of conversation. Impaired word/sentence comprehension.	Word substitution errors in speech. Significant drop in premorbid spelling ability.	Out-of-character behaviour - apathy; social/E/ sexual <u>disinhibition</u> ; loss of insight; marked change in eating habits; swearing; reduced empathy; stereotyped-repetitive behaviour.	Slow or makes mistakes in DIY tasks that were once easy. Accidents while driving a car.	
Difficulties in situations <u>that</u> involve learning to operate new gadgets or equipment.	Gets agitated/depressed due to frustrations at inability to do things that could do before. Family/spouse take over more and more responsibilities that the patient used to perform in the past.	Patient looks <u>bewildered</u> , and turns to partner for answers to questions.		Cognitive symptoms do not improve with anti-depressant medication, time off work, etc. Presence of apathy rather than depression more suggestive of neurological basis.	
	Cannot readily give names and ages of children or grandchildren, and may frequently confuse one with another.				



A.D. CLINICAL FEATURES	1-2 <del>yr</del> history of progressive cognitive deterioration with memory loss as the initial clinical feature	Difficulty in following conversations. May make remarks that are not appropriate to the context of the conversation. Loses track of what he/she or others have said.	Frequent difficulty in remembering names of children or grandchildren, compared to earlier intact ability. Cannot interact or play games with children / grandchildren as before.	Patient looks bewildered. Turns to partner for answers to questions.	Frequently repeats himself/herself (statement more than question) – several times a day rather than just occasionally.
Difficulties in <del>learning</del> that involves new instructions				Difficulty in planning events or activities that – e.g. holidays, parties	
Difficulty in following plots in films/soap operas - may see film again without realising having seen it before	Difficulty in finding parked car. Difficulty in navigating around familiar supermarket. Forgets where items are located in the house/kitchen.	Gets agitated/depressed due to frustrations at inability to do things that he/she could do before, rather than mood state occurring in isolation	Forgets that family members/close friends are no longer alive, have recently been married / divorced, had children, etc.	Impaired performance in work/domestic settings. If person is living alone, consider 'fridge test' – does fridge show signs of major memory lapses.	<b>A.D. COGNITIVE TEST PROFILE</b> Significant drop from immediate <del>to</del> delayed recall.
	<b>Alzheimer, <u>Frontotemporal</u> and Ischaemic Vascular Dementias</b>				Disoriented for time (day, month, year)
Forgets major personally experienced events from the last few years (e.g. holidays, hospital treatments)					Impaired semantic verbal fluency
					Impairment on some visual tests with a switching or problem-solving component.
Difficulty in assimilating what is read. May read something again without realising having read it before.					Impaired performance on recognition memory tests (not chance)
					Impairment on WAIS Block Design, copy of complex figure or Necker 'wire' cube. Clock drawing.
					Remote memory deficits on knowledge and autobiographical memory tests
Navigational difficulties in settings that were previously easy. Thus, difficulty in navigating to familiar places, or in learning a new route after several journeys.					<b>FTD-TEMPORAL</b> Left variant – word-finding, read/spell irregular words, comprehension, <del>agnosia</del> . Right variant has
Impoverished knowledge of recent news events such as deaths of leading personalities.					

<b>CEREBROVASC. DEMENTIA (CVD)</b> <b>Clinical -</b> Vascular risk factors (cardiac history, history of TIA, high BP) in CVD. Slowing down, variability, behavioural/mood disturbance more common in CVD than AD. News events, autobiographical memory & orientation for time/place better in CVD than AD.			variant has identification problems that may include prosopagnosia, and loss of knowledge of famous personalities. Later stages of FTD-temporal often see behavioural changes that include apathy, <del>disinhibition</del> , change in eating habits, <del>lack of empathy</del> , <del>obsessionality</del> .
<b>Cognitive -</b> Delayed recall worse, and silhouette naming better, in AD compared to subcortical vascular dementia. Cues help recall in CVD more than in AD. AD patients without language impairment better on verbal fluency and worse on recognition memory than CVD patients. Timed attention and executive dysfunction worse in subcortical CVD. More marked & more generalised anterograde memory impairment in AD.			<b>FTD-FRONTAL</b> Apathy, <del>disinhibition</del> , increased appetite, sweet tooth, poor eating habits, lack of empathy, poor insight, obsessional or ritualistic behaviour and distractibility.  <i>Test Scores –</i> Compared to AD, more impairment in executive function tests. Less impairment on anterograde memory tests & <del>visuospatial</del> deficits. Compared to <del>psychiatrically</del> similar cases, <del>Hayling</del> , Backward span, Trails & Fluency are low. Family history more likely in FTD than AD.
<b>CEREBRAL AMYLOID ANGIOPATHY</b> Usually presents with haemorrhagic strokes. Location of vascular lesions may contribute to profile, though reduced perceptual speed, and impaired episodic memory has been reported.	<b>Frontotemporal DEMENTIA (FTD) v ALZHEIMER (AD)</b> Perseverations & concrete responses more common in FTD-frontal. In drawing, spatial errors more in AD, organization errors more in FTD-frontal. Everyday memory and recent autobiographical memory better in FTD than in AD. Navigation skills better in FTD.		
<b>POSTERIOR CEREBRAL ATROPHY</b> Usually presents with visual symptoms, such as in reading, driving, going up/down stairs, dressing, locating items in array, etc. <del>Simultanagnosia</del> common. On testing, alexia, <del>agraphia</del> , poor performance on <del>Navon</del> letters (large letters made from different small letters), and in describing a complex scene. Memory relatively preserved.	<b>FTD and PROGRESSIVE NONFLUENT APHASIA (left inferior frontal/<del>perisylvian</del> fissure)</b> Laboured, <del>telegrammatic</del> speech. Single word comprehension intact, but syntax comprehension impaired. Impaired repetition. Memory intact, apart from complex verbal material. Executive deficits. <del>Buccofacial</del> apraxia. <del>Visuoperceptual</del> functions intact. More common in women. May be presenting feature of CBD, Alzheimer's, PSP, <del>MND</del> .		
© Narinder <del>Kapur</del> & Veronica Bradley, October 22, 2011 These guidelines need to be considered in the context of clinical, imaging and laboratory findings			