

Ali A Marvasti - Iran

ELECTIVE REPORT:

Iranian Centre of Neurological Research (ICNR)

Imam Khomeini Hospital

Tehran, Iran

1. THE LOCATION: Tehran, Iran

Tehran is a huge city of 10-14 million residents making up about 1/7th of the country's population. The national language is Farsi (aka Persian) and the official religion is Islam.

Tehran is extremely sunny and hot in the summer, average temperature during my stay was 37°C with a peak of 40°C.



Costs

Tehran is a relatively cheap destination. Each pound is worth approx. 2'000 tomans (20'000rials). For comparison, a standard restaurant meal costs ~2pounds and a 45mins taxi ride from the airport is about 6 pounds, an extremely expensive meal at a luxury restaurant costs the equivalent of 6pounds for a single person.

Most transactions are made by cash, but increasingly more locations are accepting Iranian cheque-money and Iranian debit cards.

Travel

The metro (underground) is newly built and clean, with air conditioned trains and costs a mere ~5pence return journey. However, there are at the moment only 3 functioning lines with the others still under construction.

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The best means of travel still remains by taxi, whether hitchhiking from the streets or calling a cab. The average taxi fare half way across the city is 3 pounds.

Tourism

In addition to being extremely affordable, Tehran has a vast and rich history from King's Palaces (Shah's of Persia) and old city gates to modern museums.

Tehran has beautiful mountains with telecabins to open-air restaurants overlooking the city. Mountaineering is a popular sport and a common excuse for socialising in the capital.

The city boasts a vibrant family night life with markets and shops and places of interest often open in the evening from about 3pm until late into the night. Iran boasts a rich cuisine with quality Persian dishes at restaurants ranging from Kebabs, Rice and unique Khoreshths to traditional starters and region specific deserts.

Tehran is surrounded by mountains, and except during winter (when there is lots of snow and rain) there is little rain and wind, and plenty of traffic all contributing to excess air pollution.

The heat of the summer requires air-conditioning 24/7 and this becomes a problem with the rationing of electricity to the city's 11million+ residents.

Some cheaper restaurants are a common cause of the high incidence of traveller's diarrhoea.

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2. THE HOSPITAL: Imam Khomeini Hospital Complex

Initial Points of Contact:

Dr. M. Ghaffarpour, Professor of Neurology and Head of Department (didn't reply to emails)

Dr. Zahedpour Anaraki, Professor of Respiratory Medicine (best source of initial contact)

The center comprises of more than 1000 hospital beds, 70 critical care beds and nearly 200 faculty staff members. In addition, the Cancer Institute for Research, Teaching and Health Services, the Center for Organ Transplant, the Research Center for Medical Technology, and many other research centers (neurosciences, reproductive medicine and cardiac) are fully active at this medical center

<http://medicine.tums.ac.ir/en/Message.aspx?lt=1&Li=52>

All patients must have medical insurance to cover costs or pay all fees before investigations and treatment are initiated. Exceptions are allowed and covered by state funds.

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3. THE WARD: Neurology/ICNR

ICNR is a 6 floor building hosting the neurological and neurosurgical patients on floors 3 and 6 respectively. The first floor hosts Genetics and all the Clinics; Level 2 is host to specialist investigations such as EEG, NCS and EMG. Floor 5 hosts the 'Drs Mess' and research offices which are currently inactive.

The Neurology Ward has 22 beds separated into male and female quarters to which family members have 24 hr access to.

Subspecialty clinics are held 3 days a week from 9:30am and include: Headache, Epilepsy, Motor Control Disorders and Memory Clinics. Upto six simultaneous consultations are held in one large room with a resident Professor of Neurology ('Consultant'). Picture Below: Students gather round the resident Consultant during a consultation.



Selection of interesting observed cases:

Rasmussen's Encephalitis
Progressive Supranuclear Palsy
Chronic TB Meningitis
Tropical Spastic Paraparesis (HTLV-1 positive)
Central Pontine Myelinolysis
Mitochondrial Cytopathy
Wilson's Disease
CADASIL
Fascio-Scapular Humeral Dystrophy
Cerebral Arteriovenous Malformation
Neuroleptic Malignant Syndrome
Tardive Dyskinesia
Pseudotumour Cerebri
Conversional gait abnormality

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Selection of cuts and wounds in A&E which I sutured:

1. 7 yr old boy had multiple cuts on his R hand and arm from broken window at home. R palm had 4 cm gaping wound from first dorsal web space extending to the palmar aspect above the base of the thumb. Another 2cm wound medial aspect of arm.



Intact neurovascular supply, very little pain and full range of motion.

A&E resident administered IM **Midazolam** for the procedure. I sutured the medial arm wound using 3 *simple interrupted* stitches under supervision of an intern (7th and final year medical student) using 3,0 *silk* (non-absorbable natural multifilament). Vaccinations were upto date. He was sent home on a 10 day course of **Cephalexin** and with instructions to return in 10 days to have the sutures removed. By the end of the procedure, the midazolam had just taken effect!

2. 20 year old RTA with multiple injuries from a motorcycle accident with total amnesia of the event came in a stable condition complaining about severe left tibial pain. Skeletal survey and radiography showed no fractures.

The wounds were dressed and two temporal wounds required stitching.



3. 23 yr old knife stab victim came in with fresh stab wounds on his scalp, arm, back and chest alongside old stab wounds. He was a suspected drug abuser and gang member.

Two scalp wounds each 2cm in length required 3,0 non-absorbable synthetic monofilament *nylon* sutures (3 x *interrupted* sutures).

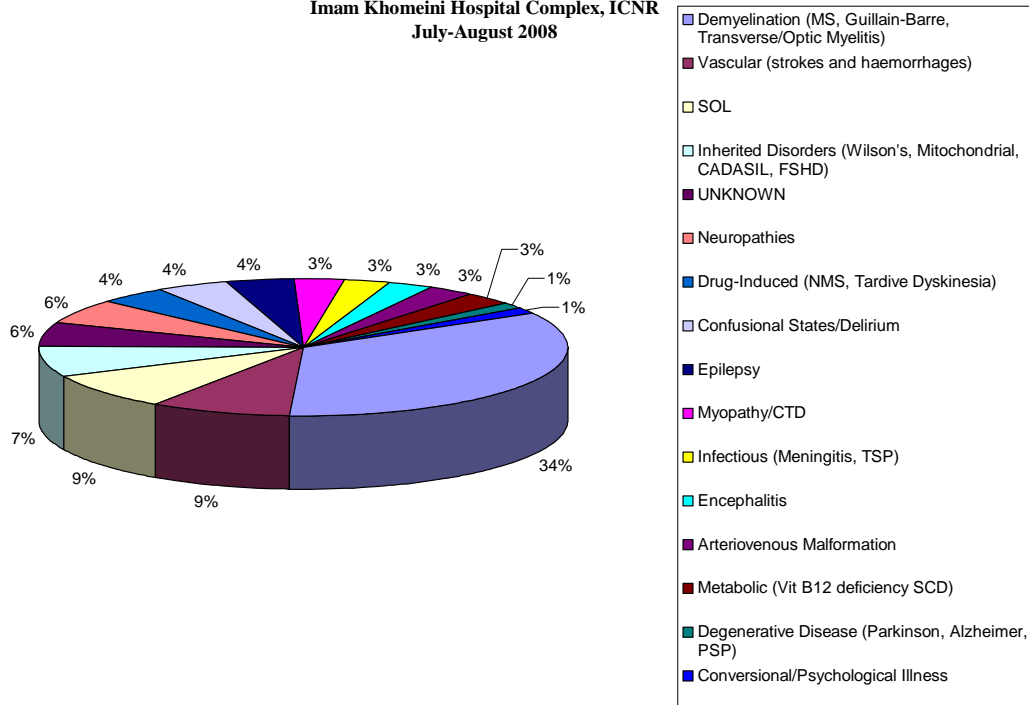
He had a large gaping wound on his back which I sutured with 2,0 non-absorbable natural multifilament *silk*, using *vertical mattress* and *simple interrupted* stitching.

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4. Research

During my stay at the ICNR, I conducted an audit of all admission to the neurological ward. The Abstract of my study follows. The full study is attached separately. (Any student going on a neurology elective and interesting in carrying out a similar audit please get in touch.)

**All Diagnoses on the Neurological Ward
Imam Khomeini Hospital Complex, ICNR
July-August 2008**



An Epidemiological Study of the Preventable Causes of Neurological Disease in a Tehran Hospital

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Abstract

Purpose: Primary care (G.P.) in Iran is not currently a specialty and is in the hands of 'generalists' who come straight out of medical school. Often neurological wards are over-subscribed and full. With a lack of previous such study, this study intends to quantify the percentage of admitted neurological illnesses that are preventable and/or iatrogenic - and thus help

1. raise awareness of the most common preventable neurological diseases, and
2. be a first step towards targeting the most common preventable neurological illnesses at the primary care level and ultimately help free up neurology ward beds.

Method: The diagnoses at all 22 beds at Imam Khomeini Hospital Complex's Neurology Ward (Iranian Center for Neurological Research, ICNR) were monitored in Tehran, Iran for 3 weeks from 20th July until 12th August 2008. History, Examination, patients' notes and direct contact with the residents on the ward were used to classify each patient's diagnosis as preventable or unpreventable and where appropriate a standard set of screening questions were used [Table 1] to further determine the possible causes of the neurological illness (e.g. infectious or drug-induced). All patients who had been formally admitted to the ward were eligible for the study.

Results: The three most common reasons for admission to the ICNR neurology ward were:

1. Demyelinating Disease 34%
(predominantly **MS**)

2. Vascular Disease 10%
(predominantly **stroke**)

3. Space-Occupying Lesions 9%
(predominantly **tumours**)

Preventable neurological illness made up 11% of the total patients admitted to the ward. The three most common preventable *diagnoses* of admitted patients were:

1. NMS, SCD and Stroke each 2.8%

2. Meningitis, TSP and Tardive Dyskinesia each with 1.4%.

The three most common distinguishable *causes* of preventable neurological illness were:

1. Drug-induced 4.4%

(NMS and Tardive Dyskinesia)

2. Vit B12 deficiency 2.9%

3. uncontrolled DM, HTN, and iatrogenic haemorrhages 2.9%

(Preventable Strokes) and

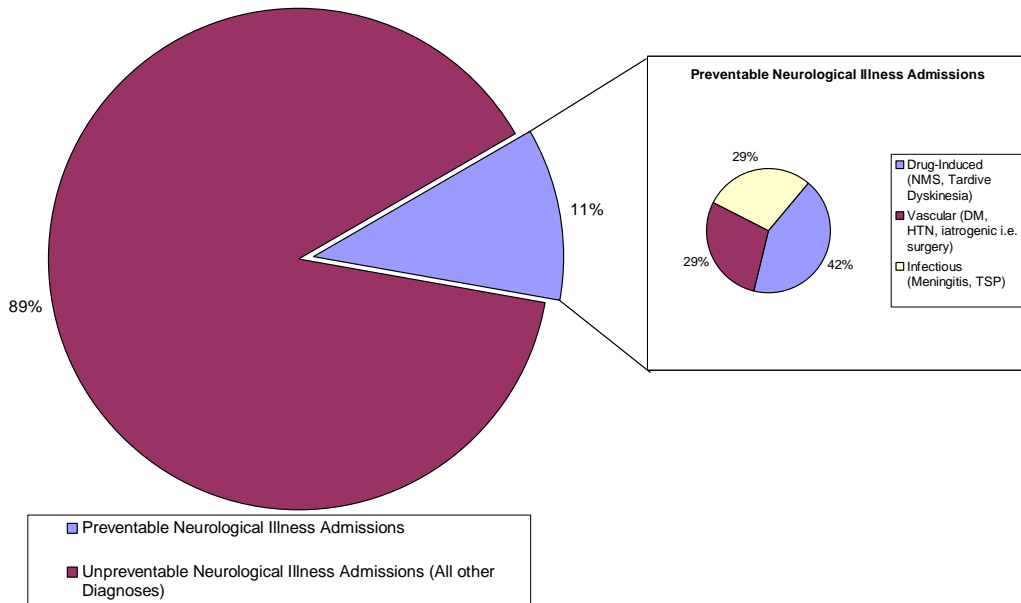
TB and HTLV-1 2.9%

(Infectious diseases).

Conclusion: The most common preventable cause of neurological illness was anti-psychotics followed closely by infections and uncontrolled diabetes. Closer monitoring of diabetic patients and those on neuroleptics by their prescribing physicians are recommended as well as increased use of atypical anti-psychotics which have less tardive side-effects.

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Preventable Neurological Illness



An Epidemiological Study of the Preventable Causes of Neurological Disease in a Tehran Hospital

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The three most common distinguishable *causes* of preventable neurological illness were:

1. **Drug-induced 4.4%** (NMS and Tardive Dyskinesia)
2. **Vit B12 deficiency 2.9%**
3. **uncontrolled DM, HTN, and iatrogenic haemorrhages 2.9%** (Preventable Strokes) and **TB and HTLV-1 2.9%** (Infectious diseases).

Conclusion: The most common preventable cause of neurological illness was anti-psychotics followed closely by infections and uncontrolled diabetes. Closer monitoring of diabetic patients and those on neuroleptics by their prescribing physicians are recommended as well as increased use of atypical anti-psychotics which have less tardive side-effects.

Table 1: Standard Screening Questions used to help determine possible causes of neurological illness.

DRUGS	Pills?	over the counter?	Injections?	Smoking?
	Herbal remedies?	Inhalers?	Allergies?	Alcohol?
INFECTIONS	Systemic illness/flu?	Nausea and Vomitting?	Pets/Animals?	Pregnancy?
	Fever?	Rash?	Travel?	Vaccinations?
TRAUMA	Falls?	RTA?		
	Fights?	Accidents?		
Systems Review	Diabetes?	Hyperlipidaemia?	Consanguinity?	
	Hypertension?	Obese?		

Introduction

The primary aim of this study is to audit patients on the neurology ward who have a secondary or *preventable* primary neurological illness as a result of known systemic disease, drug-induced neuropathy, infectious disease, or metabolic disorders (inherited e.g. PKU or acquired e.g. Vit B12 deficiency). This is in the hope that indicative results will be obtained in order to help the ranking of the most common preventable neurological diseases, so as to target their prevention effectively and efficiently in the Tehran, Iran region. A secondary goal of this study is to simply rank the most common illnesses (irrespective of whether they are preventable or not) at ICNR neurology ward in Tehran, Iran.

Method

Every morning patients' diagnoses on all 22 neuro beds at Imam Khomeini Hospital (ICNR) were recorded and progress on uncertain diagnoses on the ward was checked with the patients physicians and their notes. A confidential list of all beds and their occupants was kept and thus overnight discharges and new admissions were easily recognisable by comparison with the list from the previous day. New

patients were followed up and all diagnoses with their relevant history, examination and investigation results were recorded. In addition to the standard procedures for the hospital in history taking, examination and investigations, in order to clarify whether there may have been a clear precipitating event or cause for the illness, all patients were enquired about recent travel, any pets, new or self-prescribed medication, history of trauma and any systemic illness preceding the neurological admission [Table 1]. ICNR's standard protocols for investigation of suspected neurological disease is mentioned here for the sake of reproducibility as well as to highlight the extent of investigations carried out before a diagnosis was reached and recorded in our database.

1. Routine Investigations: FBC; U&E (BUN, Creatinine, $[Na^+]$, $[K^+]$, $[Ca^{2+}]$, $[PO_4^{3-}]$); PT; aPTT; LFT (AST, ALT, ALP); ESR; CRP; LDH

2. Investigations for suspected Multiple Sclerosis: RF; ANCA; FANA; anti-dsDNA; anti-phospholipid and anti-cardiolipin IgG and IgM; CRP; ESR; Wright; VDRL; Blood and CSF (IgG, Protein, OCB); CSF culture before corticosteroid administration (S/E.U/A.U./C.PPD)

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3. Investigations for suspected

Myasthenia Gravis: ABG; IgA; Ach-R antibody; T3; T4; TSH

4. Investigations for suspected Venous

Sinus Thrombosis: FANA; anti-ds DNA; anti-phospholipid and anti-cardiolipin antibodies; RF; ANPA; C3 and C4; CH50; Ham Test; CRP; APC-R; AT(G2021UA); Homocysteine; ESR; Factor VIII; Factor III; Protein C&S

5. Investigations for suspected

Mitochondrial Disease: ABG; serum and CSF (lactate:pyruvate)

6. Investigations for suspected

Dementia: ALT; AST; ALP; T3; T4; TSH; B12; Folic Acid

7. Investigations for suspected Guillain-Barre:

routine investigations + HIV.

8. Lumbar Puncture LP done for all suspected cases of raised ICP (after CT); all suspected sinus thromboses; some patients suspected of having demyelinating disease (Guillain-Barre or MS) or some suspected cases of

meningitis/encephalitis; and all suspected cases of pseudomotor cerebri (benign intracranial hypertension). All patients that were discharged without a clear diagnosis were recorded as having an “unknown” diagnosis. There was one case of an Arterio-Venous Malformation in a 15 yr old boy who went to neurosurgery and had to be re-admitted to the neurology ward with a right-occipito-parietal haemorrhagic stroke secondary to the operation. This patient was thus admitted for two different (but linked) reasons and was recorded as two separate cases (‘AVM’ and ‘Preventable Vascular’).

The diagnoses of all the admitted patients were entered into an Excel Spreadsheet at the end of each week and grouped according to common categories in Textbooks and according to similar pathophysiology and/or presentation (e.g. MS and Guillain-Barre under Demyelinating Disease).

Results

The preliminary results that follow are based on incomplete patient data obtained from the months of July-August 2008 at ICNR. The total number of diagnoses that have been entered into the database currently stands at 71.

Demyelinating disease was by far the most common diagnosis and Multiple Sclerosis was the major single diagnosis from all admitted patients. Vascular events and Space-Occupying Lesions

were the next most common diagnoses [Figure 1].

The auditing of admitted patients to the ward will be continued from September to October 2008 and combined with the current data set. Ultimately results obtained from Addenbrooke's Hospital, Cambridge, UK will be compared with those from ICNR, Iran and a complete paper comparing the results from the two teaching hospitals in Iran and England will be submitted at the end of 2008.

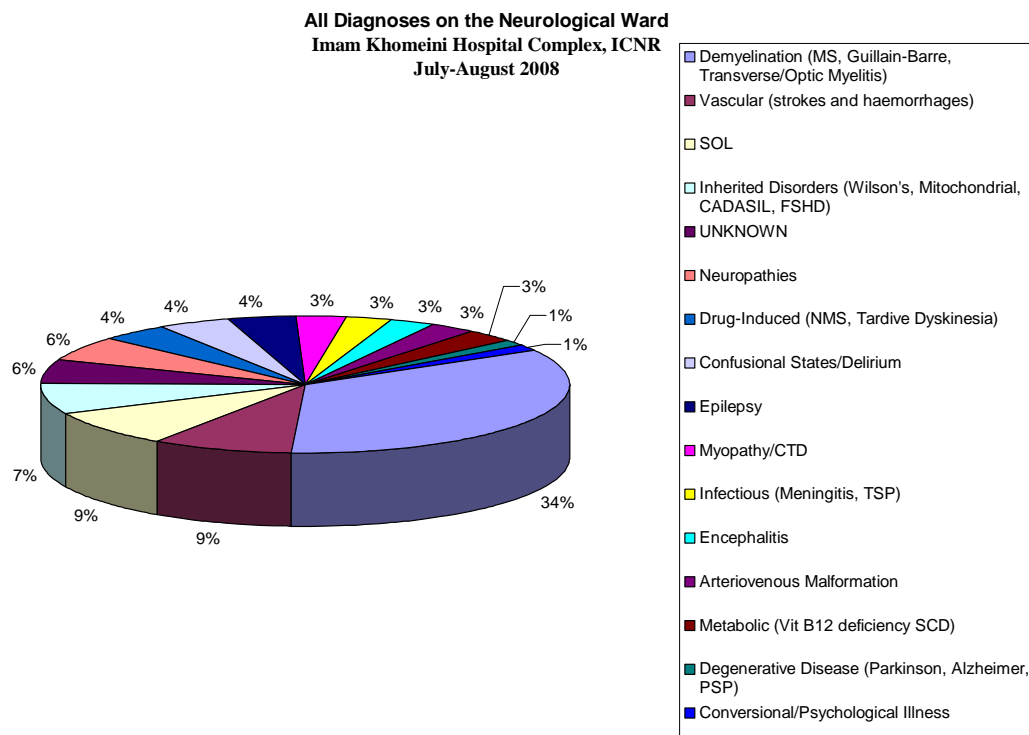


Figure 1: Breakdown of all admissions to the neurological ward by diagnosis. Demyelinating disease was by far the most common diagnosis from the 63 patients whose data are available ($p < 0.05$).

From the admitted patients, 11% of the diagnoses were considered to be preventable neurological illness; either iatrogenic (drug-induced, surgery) or infectious [Figure 2]. The commonest cause of preventable neurological illness

was neuroleptic anti-psychotic drug use and Vit B12 deficiency, followed by uncontrolled risk factors for stroke (hypertension and diabetes) and then followed by infectious causes of neurological illness (e.g. TB, HTLV-1).

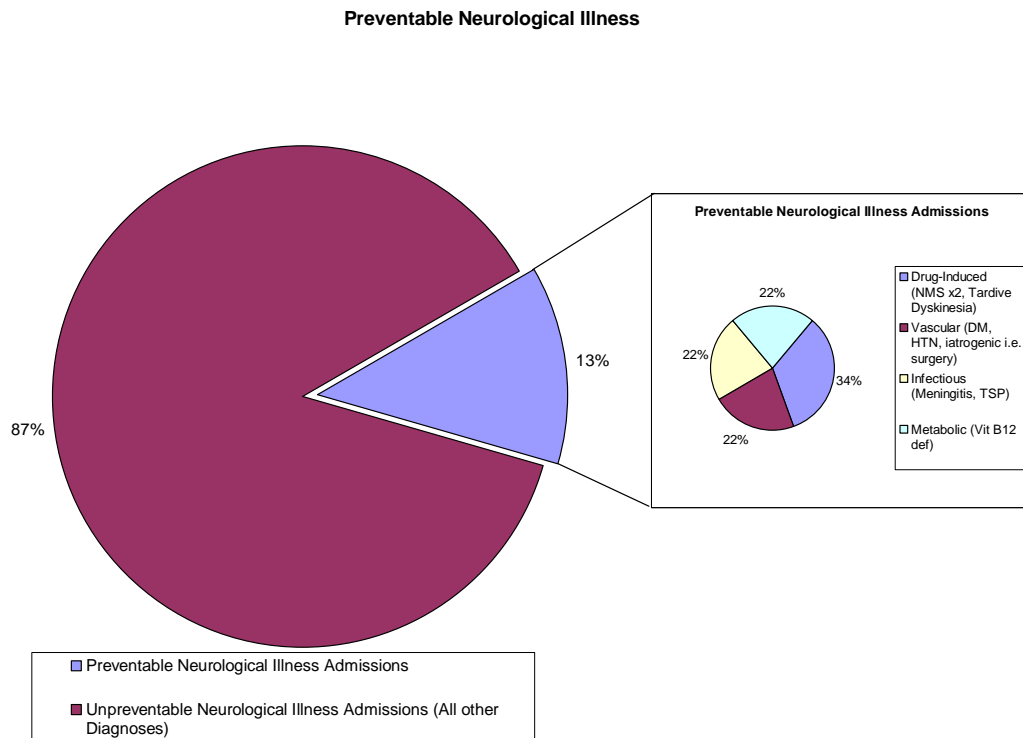


Figure 2: Preventable Neurological Illness of all patients admitted to the ICNR neurological ward. Preventable disease made up 11% of the main diagnosis resulting in admission.

Discussion

Atypical anti-psychotics (e.g. Quetiapine and Olanzapine) are less likely to cause tardive dyskinesias and NMS and should be substituted for the oft-prescribed Haloperidol to reduce drug-induced admissions to neurological wards. It must however be noted that tardive dyskinesias may also develop in the general population (1-2%) and in

patients with Schizophrenia (~5%) despite the lack of any neuroleptic medication¹. By targeting preventable causes of illness, 2-3 beds at ICNR from their total of 22 will become available to other patients. Currently there aren't enough patients to give a powerful statistical analysis but this should be resolved once further data becomes available – see below.

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Further Audits

A Medical Student from Tehran University will continue this audit from September – October 2008 in order to increase the number of diagnoses and allow enough power for statistical analysis. It is hoped that similar parallel data will be obtained from Addenbrooke's Hospital, Cambridge during my current 4 week Student Selected Component (SSC) running from August – September in order to be compared with these ICNR, Tehran results.

Appendix

For the Excel files, the final report comparing results to neurological admissions at Addenbrooke's Hospital and/or to highlight mistakes in this preliminary report please contact: am553@cam.ac.uk

¹ [A complete list of references will be made available in the final version of this study.]