

## EDITOR'S CHOICE

**SPEECH: Reinventing the Arch**

A simplistic neural model of language consists of input at the superior temporal gyrus (Wernicke's area) and output at the inferior frontal gyrus (Broca's area) with a connecting tract, the arcuate fasciculus, arching from one to the other around the back of the Sylvian fissure. Receptive, expressive and conduction aphasia, respectively, by this model follow damage to Wernicke's, Broca's and the arcuate. Dejerine described the arcuate fasciculus itself in 1895 but even before this Lichtheim, on the basis of the myriad forms of conduction aphasia, had proposed an additional 'centre' in the network. Geschwind developed this argument and emphasised the role of the inferior parietal lobule (Brodmann areas 39 and 40). This beautifully illustrated paper describes the most interesting result yet from the technique of diffusion tensor magnetic resonance imaging. Diffusion tensor imaging (DTI) depends on the principle of anisotropy. In brief, water molecules diffuse more easily along myelin sheaths than across them and this property can be tracked from an initial 'seed' point, revealing the course of fibre bundles through white matter. Catani and colleagues use DTI in eleven healthy right-handed males to show the course of the arcuate fasciculus through the left hemisphere and also demonstrate the existence of two associated fibre bundles, one connecting Broca's area and the inferior parietal lobule and one connecting Wernicke's area to roughly the same location. They suggest, very plausibly, that relative damage to these tracts may correlate with the varied presentations of conduction aphasia. This study consolidates more than a century of work and shows the promise of DTI as complement to other imaging modalities. The spatial resolution of DTI will need to improve, however, if it is to reveal truly novel brain networks. - *RRD*

Catani M, Jones DK, ffytche DK and DH.

*Perisylvian language networks of the human brain.*

ANNALS OF NEUROLOGY

2005;57:8-16.

**NEUROINFLAMMATION: Antigen-presentation in EAE**

## ★★★ RECOMMENDED

Microglia, mysterious little mites at the best of times, are classically considered as the antigen-presenting cells of the brain, responsible for bringing together the nasty autoaggressive cells and myelin antigens (doing the job of the "dendritic cells" of the systemic compartment which supposedly do not get into the brain). And, certainly, microglia are critical for inflammation in the brain, because getting rid of them abolishes EAE. However a couple of recent studies in Nature Medicine have thrown doubt on their antigen-presenting role. Although seemingly trivial, this issue is of critical importance for those who muse on immunotherapies designed to intervene in the process of antigen presentation (not, I admit, a large group of people, but an interesting bunch). Stephen Miller's group in Chicago examined the classical immunological phenomenon of "epitope spreading" whereby an immune response elicited against one antigen leads, in time, to immune responses against other related antigens (a process which may lead to the chronicity of some inflammatory diseases). They are especially interested in epitope spreading in EAE and, specifically, where this happens – in the periphery or in the brain? They use a beautiful model: following the proliferation of CFSE-dye labelled CD4+ T cells that recognise one PLP peptide (139-151) in the context of EAE induced by another PLP peptide (178-191). They showed that the first sign of activation of the CFSE-dye labelled cells (indicating spread of the epitope to the 139-151 peptide) occurred in the CNS, before they become activated in the systemic compartment. This proves what many have long suggested: that naive cells can enter the intact brain, there to be activated locally by antigen presenting cells. But what antigen-presenting cells were doing this? Well, not microglia it turns out but some old-fashioned dendritic cells (CD11 positive for DC nerds), which, as I said, are not supposed to be in the brain... Burkhard Becher's team, from Zurich, follow this nicely with a study in MOG-induced EAE. They showed that encephalitogenic T cells could induce EAE when transferred to a naive host, even when that host was completely devoid of a lymphoreticular system and spleen! They then developed, using a complex blend of transgenics and radiation, host animals with Class II restricted antigen-presenting cells restricted either to the CNS or the systemic compartment. Only the latter animals developed EAE on transfer of encephalitogenic T cells, implying that systemic antigen presenting cells are obligatory for the development of the disease. They further narrowed down the culprit antigen-presenting cells. By expressing class II under the CD11 promoter in otherwise class II deficient mice, they generated animals with only a few dendritic cells in the meninges and CNS blood vessels; yet these animals expressed EAE on transfer of encephalitogenic T cells. So it seems that the microglia are not needed for antigen presentation in EAE after all; a group of hitherto poorly recognised "systemic" antigen presenting cells, lurking in the meninges and CNS blood vessels, do the job rather well without them. Fascinating! -*AJC*

McMahon EJ, Bailey SL, Castenada CV, Waldner H, Miller SD.

*Epitope spreading initiates in the CNS in two mouse models of multiple sclerosis.* NATURE MEDICINE

2005;Mar:11(3):335-9. Epub 2005 Feb 27.

Greter M, Heppner FL, Lemos MP, Odermatt BM, Goebels N, Laufer T, Noelle RJ, Becher B.

*Dendritic cells permit immune invasion of the CNS in an animal model of multiple sclerosis.*

NATURE MEDICINE

2005;Mar:11(3):328-34.

**REHABILITATION: Improving outcomes through teamwork**

One of the key factors in the benefit of stroke (and other rehabilitation) units has been identified as the multi-disciplinary (MDT) team-work, yet studies on what form this team-work should take are limited. This paper, though not a randomised controlled trial, does shed some light on how team-work can be improved to optimise patient care in a clinical setting. Perhaps not surprisingly, it showed that a MDT ward round (including a physician!) does significantly improve patient involvement and goal-setting over a standard MDT "chart round". The ward round also improved "team working" though did take twice as much staff time (and presumably, cost!). Though not "rocket science", it does add evidence to what many rehabilitation units practice on a routine basis and highlight how practical measures can improve patient care without scientific breakthrough. It also illustrates the type of practical studies that can be performed in the clinical setting to improve the evidence base for our practices. As the most expensive member of the MDT it does raise the question of how physician time should be best used? -*JMcF*

Monaghan J, Channell K, McDowell D and Sharma AK.

*Improving patient and carer communication, multidisciplinary team working and goal-setting in stroke rehabilitation.*

CLINICAL REHABILITATION

2005;19:194-9.

**Panel of Reviewers**

<b>Roger Barker</b>	Honorary Consultant in Neurology, Cambridge Centre of Brain Repair
<b>Richard Body</b>	Lecturer, Department of Human Communication Sciences, University of Sheffield
<b>Alasdair Coles</b>	Lecturer, Cambridge University
<b>Rhys Davis</b>	Research Registrar, Addenbrooke's Hospital, Cambridge
<b>Dan Healy</b>	Neurology SPR, National Hospital, Queens Square, London
<b>Lucy Anne Jones</b>	Research Associate (Cognitive Neuroscience)
<b>David Lythgoe,</b>	Centre for neuroimaging sciences, Institute of Psychiatry, London
<b>Mark Manford</b>	Consultant Neurologist, Addenbrooke's Hospital, Cambridge, and Bedford Hospital
<b>Andrew Michell</b>	Neurology Research Registrar, Addenbrooke's Hospital, Cambridge
<b>Wendy Phillips</b>	Research Registrar, Addenbrooke's Hospital, Cambridge
<b>Robert Redfern</b>	Consultant Neurosurgeon, Morriston Hospital, Swansea.
<b>Liza Sutton</b>	UCL PhD Student, Institute of Neurology
<b>Sarah J Tabrizi</b>	DoH Clinician Scientist and Clinical Senior Lecturer, Institute of Neurology
<b>Ailie Turton</b>	Research Fellow, Burden Neurological Institute, Bristol

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**PRION DISEASE: A meal fit for a monkey?**

★★★ RECOMMENDED

When does feeding two macaques a meal, and watching what happens, get you a letter in the *Lancet*? When you have fed them brain homogenate from a BSE-affected cow, of course. One of the animals got variant CJD at 60 months, the other remained well at 76 months. The rest of the article examined the oral dose of brain homogenate required to cause CJD in primates, cattle, mice... and extrapolated to humans. In particular, the authors considered the risk of humans getting CJD from meat declared non-infected with PrPSc using the standard EU-approved testing kit (for which the authors' institution handily holds a patent but I am sure that had nothing to do with their desire to publish these data). The authors conclude that "If people were to eat CNS tissues from a cow with preclinical BSE with a concentration of PrPres just below the test detection limit of 1 in 300, they would need to ingest at least 1.5 kg to reach the degree of exposure equivalent to that in the 5 g of brain used for oral transmission to the macaque in the present study". Anyone for a BigMac? -AJC

**Lasmezas CI, Comoy E, Hawkins S, Herzog C, Mouthon F, Konold T, Auvre F, Correia E, Lescoutra-Etchegaray N, Sales N, Wells G, Brown P, Deslys JP. Risk of oral infection with bovine spongiform encephalopathy agent in primates.**

LANCET

2005;Feb 26;365(9461):781-3.

**ALZHEIMER'S DISEASE: Environmental enrichment in AD – an exercise in amyloid clearance**

★★★ RECOMMENDED

The deposition of amyloid is a characteristic feature of Alzheimer's disease, the A $\beta$  amyloid peptide being cleaved from APP by the action of BACE1 and gamma-secretase. In this paper Lazarov et al propose the unusual hypothesis that A $\beta$  amyloidogenesis can be modulated by environmental experience, on the grounds that APP processing plus A $\beta$  production is modulated by synaptic activity which is known to be influenced by environmental factors. They therefore used a well established transgenic mouse model in which the familial Alzheimer disease linked APP Swedish mutation and the presenilin 1E9 polypeptide variants are crossed to give a mouse which is known to produce A $\beta$  deposition throughout the hippocampus and cortex. These mice were then split into groups. One was brought up in a standard environment whilst the other was housed in an enriched environment. They demonstrated that the enriched environment reduced the amount of A $\beta$  deposition whilst increasing the degrading protease, neprilysin. Furthermore using Affymetrix gene chips microarray they demonstrated there was selective upregulation in a range of intermediate early gene (IEG) transcripts encoding polypeptides involved in endothelial and phospholipid metabolism as well as neurogenesis and cell survival pathways. However no behavioural tests were undertaken so it is not clear whether these molecular changes map onto any significant behavioural improvements. Furthermore other studies have not found this relationship; indeed some have even reported the opposite (*Jankowsky JL et al 2003, Experimental Neurology 62 1220 – 1227*). So what this really means is debatable, especially given the controversy over the role of amyloid in Alzheimer's pathogenesis. Nevertheless this fascinating study once more emphasises that an enriched environment can be good for the brain even in disease, although exactly how this influences the clinical condition is unknown. - RAB

**Lazarov O, Robinson J, Tang YP, Hairston IS, Korade-Mirnic Z, Lee VM, Hersh LB, Sapolsky RM, Mirnic K, Sisodia SS.**

*Environmental enrichment reduces Abeta levels and amyloid deposition in transgenic mice.*

CELL

2005;Mar11;120(5):701-13.

**STEROID DEMENTIA: Can you remember the last time you took steroids?**

There is a well known action of steroids within the brain which involves changes in mood and behaviour as well as a role in modulating inflammatory disease processes. However two new papers suggest that steroids may have a more profound, but transient, effect on cognitive functioning. In their case report, Sax and Schulman describe a patient with a dementia induced by high dose oral steroids for polymyalgia rheumatica which reversed on stopping this treatment. Whilst Brunner et al in their study looked at the effects of steroids on cognitive function in the context of acute optic neuritis (9

patients) and MS (21 patients) and found changes in some forms of memory whilst leaving untouched a range of other neuropsychological tests. These changes were all reversible. These short papers are interesting and raise many questions. Firstly how frequent are these side effects of steroids and to what extent does it impact on the patient and his quality of life. Secondly how do steroids produce this effect? In answer to the first question, more detailed studies are needed in larger numbers of patients using a range of measures. In terms of mechanisms, there has recently been a great deal of interest in the role of steroids on adult endogenous precursor cell turnover and survival, especially in the hippocampus, which is interesting given the memory deficits highlighted in these studies. Thus once more we are looking at the possibility that well established drugs may have unusual effects which may be mediated through these mysterious, newly discovered, population of adult neural cells. - RAB

**Brunner R, Schaefer D, Hess K, Parzer P, Resch F, Schwab S.**

*Effect of corticosteroids on short-term and long-term memory.*

NEUROLOGY

2005;64:335-337.

Sacks O, Shulman M.

*Steroid dementia: An overlooked diagnosis?*

NEUROLOGY

2005;64:707-709.

**PARKINSON'S DISEASE: Microglia in PD – an inflammatory topic?**

The role of inflammation in the pathogenesis of neurodegenerative diseases is an area of intense interest, most notably in Alzheimer's disease. However in Parkinson's disease (PD) it has been known for over 20 years that there is increased microglia activity in post mortem tissue around the midbrain dopaminergic neurons. Furthermore a couple of years ago it was reported that the use of anti-inflammatory drugs may actually impact on the risk of developing Parkinson's disease. However the unresolved problem has always been the extent to which any inflammatory abnormalities are secondary to the cell loss rather than a primary mover in the disease process. Now Ouchi et al have shown, using PET-PK11195 PET, that there is microglia activation with dopamine loss in early Parkinson's disease. On the basis of temporal expression of microglial markers with dopaminergic terminal loss, the authors conclude causality. However this is not the strongest of arguments, especially as other groups using similar approaches have failed to replicate this relationship. The group did not attempt to intervene and assess the impact of modifying the inflammatory response. Nevertheless it does raise intriguing questions on PD pathogenesis as well as the role of inflammation in neurodegenerative disorders. In addition it may provide a useful biomarker of PD or at least serve as a surrogate marker for investigating neuroprotective therapies in this common condition. - RAB

**Ouchi Y, Yoshikawa E, Sekine Y et al.**

*Microglial activation and dopamine terminal loss in early Parkinson's disease.*

ANNALS OF NEUROLOGY

2005;57:168-175.

**ALZHEIMER'S DISEASE: Effects of cognitive-communication stimulation for AD patients treated with Donepezil**

This study is representative of a growing field of research in which drug treatments are investigated in combination with cognitive rehabilitation programmes (traumatic brain injury being another field undergoing this sort of investigation). The authors conclude that this study "adds to the growing evidence that active cognitive stimulation may slow the rate of verbal and functional decline in Alzheimer's Disease (AD) when combined with acetylcholinesterase inhibitors". The combination of cognitive stimulation and donepezil was administered to 26 participants with mild to moderate AD, while a further 28 received the drug treatment alone. The stimulation programme was delivered in groups, covered a period of 8 weeks and involved a total of 12 hours contact time for each participant. Performance was measured in terms of relevance of discourse, performance of functional activities, emotional symptoms, quality of life and global functioning. Follow-up measures were taken 4 and 8 months after intervention. Slower rates of decline in the areas of discourse, functional abilities, emotional wellbeing and global functioning were found for the group receiving both forms of treatment. Though the gains (or more accurately the slower rates of decline) were relatively modest, the authors point out that they were achieved with fairly short-

term (and low cost) group intervention and that they persisted until the end of the study. Having said this, they also acknowledge that the study design did not allow them to differentiate between specific cognitive therapy and the possible effects of general stimulation by increased contact between participants and professionals. - RB

Chapman SB, Weiner MF, Rackley A, Hynan LS & Zientz J.

*Effects of cognitive-communication stimulation for Alzheimer's Disease patients treated with Donepezil.*

JOURNAL OF SPEECH, LANGUAGE, AND HEARING RESEARCH  
2004;47:1149-63.

## ALZHEIMER'S DISEASE: Effects of Alzheimer's disease in a creative writer

★★★ RECOMMENDED

The novelist Dame Iris Murdoch is perhaps the most high profile individual to have suffered from Alzheimer's disease in the UK, largely as a consequence of her husband John Bayley's book about her illness and the subsequent film of the book. Her literary output over many years has provided the opportunity to undertake a retrospective examination of certain cognitive operations during the presymptomatic period of the disease. A systematic comparison of three of her novels was undertaken: *Under the net* (1954), her first published novel; *The sea, the sea* (1978) which won the Booker prize; and *Jackson's dilemma* (1995), her last published work, which received a lukewarm response from the critics. Retrospectively, it seems likely she was in the preclinical phase of AD when writing this. Texts were analysed using a variety of methods, both automated and manual. The final novel was found to have a more restricted vocabulary, implying greater repetition, than the earlier works. Although this was also the least syntactically complex of the three books, nonetheless syntactic structures were relatively unchanged. The fact that Iris Murdoch resisted all editorial suggestions to alter her submitted texts (imagine such a situation in neurology: referees and editors could be done away with entirely!) gives the analytical approach used here some validity. It is interesting to read AN Wilson's accompanying editorial (*Brain* 2005;128:237-8) suggesting that, as an author, Murdoch was "extremely careless and none of her books really contains a simple or perfectly organised plot". The paper is also testament to the fact that education and creativity per se are not necessarily guarantees against the development of AD (the author of Gulliver's travels, Dean Jonathan Swift, also developed dementia, probably AD, in later life). - AJL

Garrard P, Maloney LM, Hodges JR, Patterson K.

*The effects of very early Alzheimer's disease on the characteristics of writing by a renowned author.*

BRAIN

2005;128(2):250-60.

## EPILEPSY: Magnetoencephalography and surgery for seizures

Brain surgery is sometimes used to control seizures when people living with epilepsy do not respond sufficiently to medication. The idea is to remove the tissues prone to epileptic activity, thus controlling seizures, while preserving tissues most important for cognitive function. Presurgical evaluation involves physiological, functional and cognitive tests and integrating results to determine how to proceed. Magnetoencephalography (MEG) is a non-invasive method for measuring neuronal activity directly. Sophisticated analysis methods are able to detect small changes in magnetic fields that accompany neuronal activity. MEG has excellent temporal and spatial resolution. There is the potential for better localisation accuracy than EEG especially when using simplistic spherical models of the head. There is faster temporal resolution than fMRI because the technique is not dependent on comparatively slow changes in blood oxygenation levels. Patients (n=33) whose pre-surgical MEG registered epileptic activity were examined pre- and post-operatively to see whether surgical outcome related to their presurgical MEG findings. The authors developed a novel method of combining groups of individual MEG source localisations into an ellipsoidal volume. The position and size of this volume was then compared with the resection volume generated using pre- and post-operative MRI data. A small distance between the MEG localisation volume and the resection volume correlated with favourable outcome measured using Engel's classification scheme. A high coverage of the MEG results ellipsoid by the resection volume also correlated with a favourable outcome. It seems that MEG will help surgeons decide which tissues to remove and which to

preserve, but only when used in conjunction with other techniques. The authors highlight the need for further research into the clinical evaluation of this method. - LAJ & DJL

Fischer MJM, Scheler G and Stefan H.

*Utilization of magnetoencephalography results to obtain favourable outcomes in epilepsy surgery.*

BRAIN

2005;128:153-7.

## MULTIPLE SCLEROSIS: Winter sunshine to reduce risk of multiple sclerosis?

Patients with multiple sclerosis (MS) are more likely to be born in May, and less likely to be born in November, reported a large population based study earlier this year. The study compared the birth dates of individuals affected with MS with two control groups; a population-based control group and unaffected siblings. A total of 42,045 affected individuals from Canada, Denmark, Great Britain and Sweden, were used. The result was obtained by comparing the observed birth frequency for each month in the affected group with the expected frequency based on the two control groups. The May/November risk was seen in individual countries, and also increased in significance with the prevalence of MS in each country, suggesting both are dictated by the same factor. The significance increased further when unaffected sibs were used as controls, excluding ethnic differences in seasonal birth patterns or survival being influenced by month of birth as potential confounders. Among affected people with a family history of MS they found 16.2% fewer were born in November relative to population controls compared with 3.0% fewer in those with no family history of MS, suggesting that the as yet unidentified environmental factor interacts with genetic risk factors. The authors go on to speculate whether maternal vitamin D levels may be responsible for the observed results, particularly during the second and third trimesters of pregnancy. - ALC

Willer CJ, Dymant DA, Sadovnick AD, Rothwell PM, Murray TJ, Ebers GC; Canadian Collaborative Study Group.

*Timing of birth and risk of multiple sclerosis: population based study.*

BRITISH MEDICAL JOURNAL

2005;Jan15:330(7483):120.

## ALZHEIMER'S DISEASE: In vivo Imaging

★★★ RECOMMENDED

A novel brain scanning technique to detect amyloid in the living brain may eventually provide a safe, cost-effective way of screening patients for Alzheimer's disease. Senile plaques, composed of amyloid- $\beta$  peptide (A $\beta$ ), are a defining neuropathological feature of Alzheimer's disease and develop many years prior to disease onset. The magnetic resonance imaging (MRI)-based technology was developed at the RIKEN Brain Science Institute in Japan utilising the amyloid precursor protein (APP) transgenic mouse model of Alzheimer's disease. Saido and colleagues found that regular 1H MRI failed to detect the smaller diffuse amyloid- $\beta$  plaques in vivo. They enhanced the sensitivity of this technique using a modified amyloidophilic probe (FSB), which incorporated a fluorine atom (19F) that is not normally encountered in biological tissues. The probe was administered intravenously to the mice where it bound to A $\beta$ -plaques and allowed them to be captured by 19F and 1H MRI. Experimentally, this technique will be useful for assessing the effectiveness of novel therapeutic agents on halting disease progression and for the identification of potential biomarkers of A $\beta$ -pathology. For ante-mortem non-invasive imaging of A $\beta$ -plaques in Alzheimer's disease 19F and 1H MRI using FSB offers several advantages over positron emission tomography (PET), a technique which is currently in clinical trials: it is cheaper, safer and offers higher spatial resolution. This approach would allow much earlier pre-symptomatic diagnosis and preventative treatment of Alzheimer's disease. Before this technology can be of use in the clinic, probe design and safety issues need to be further investigated. - LMS & SJT

Higuchi M, Iwata N, Matsuba Y, Sato K, Sasamoto, Saido T.

*19F and 1H MRI detection of amyloid  $\beta$  plaques in vivo.*

NATURE NEUROSCIENCE

2005;online publication:doi:10.1038/nn1422

## EPILEPSY: Ethnic bias in surgery

The number of patients in ethnic minorities with epilepsy in the USA is what one would expect for their proportions in the community; around 26% of residents of Alabama are African Americans and they represent 25% of 432 patients with TLE seen at the University Hospital in Birmingham. 130 had mesial temporal sclerosis (MTS) based on MRI findings. But only 9% who

underwent surgery were African American. The difference remained between ethnic groups, even after adjustment for socio-economic factors. Possible reasons include a greater tendency for African Americans to decline invasive treatments, which has been documented in cardiology studies, differences in family support, and a poor relationship with health-care staff. The authors note that none of the treating clinicians was African American. Who knows how we perform in the UK? This study is easy to do where ethnic minorities are relatively large but in most UK population centres they are small and the confidence intervals of the statistics would be so wide as to be difficult to assess. - *MRAM*

**Burneo JG, Black L, Knowlton RC, Faught E, Morawetz R, Kuzniecky R.**  
*Racial disparities in the use of surgical treatment for intractable temporal lobe epilepsy.*

NEUROLOGY

2005;64:50-54.

### EPILEPSY: Does it damage the brain?

A central debate in epilepsy circles and a common question from patients is: "Does epilepsy damage the brain?" In this study, 103 patients were recruited from 1993-2000 with newly diagnosed focal epilepsy based on clinical pattern EEG or MRI. Patients' treatment was by inclusion into randomised drug trials of carbamazepine versus vigabatrin or tiagabine. There was a broad spectrum of causes of epilepsy. Volumetric studies of the hippocampus were obtained. In 8 cases there was some evidence of hippocampal asymmetry at diagnosis. In 13 patients hippocampal volume declined more than 12% over 2-3 years. All but one of these patients was seizure-free after starting medication but they tended to have had a longer seizure history with more attacks before the start of treatment. There was no control group in this study and there are well recognised changes in hippocampal volume from just ageing alone, so the significance of this finding, which is related to historical controls, is uncertain. In any event, for the majority of patients with newly diagnosed focal epilepsy in adulthood, there was no significant change in hippocampal volume in 2-3 years after diagnosis. There was no development of hippocampal sclerosis during follow-up. The question remains unanswered as longer follow-up may be needed; there may be different subgroups; and the effects of seizures in children remains to be established. - *MRAM*

**Könönen M, Roberts N, Vanninen R, Pitkänen A, Kälviäinen R.**  
*Hippocampal damage in newly diagnosed focal epilepsy. A prospective MRI study.* Salenperä T.

NEUROLOGY

2005;64:62-68.

### REHABILITATION: Non-invasive motor cortex stimulation improves hand function in stroke patients

★★★ RECOMMENDED

Interest in using cortical stimulation as a tool for rehabilitation after stroke is increasing. A successful outcome was reported in a stroke patient stimulated with implanted electrodes. Now results from a study using non-invasive cortical stimulation on six stroke patients shows that it may be used to improve recovery of hand function without surgery. In a double blind, sham controlled cross-over study, six chronic stroke patients with subcortical lesions, were treated with transcranial direct current (tDC) stimulation over the hand area of motor cortex. The stimulation site was found by co-registration with each individual's MRI. Performance on an ecologically valid hand function test (Jebson-Taylor hand function test) improved significantly after twenty minutes of tDC stimulation but not with sham stimulation. The effect lasted for as long as the 25 minute follow up period after stimulation, but had disappeared by the time of a subsequent test ~10 days later. All six patients showed a small improvement of ~12% associated with increased excitability in the affected hemisphere. The subjects were asked to rate discomfort from the procedure and their feelings of fatigue and attention during the experiment. They were unable to tell the difference between real and sham tDC stimulation and there were no significant differences in fatigue or attention. Reports of discomfort were low (level 1 on a scale of 1 to 10 for five subjects and level 2 in the remaining subject). The small beneficial effect on patients who were over one year post stroke together with the lack of discomfort holds promise that non-invasive stimulation may be a useful adjunct to hand function training in rehabilitation. - *AJT*

**Hummel F, Celnik P, Giraux P, Floel A, Wu W-H, Gerloff C, Cohen LG.**  
*Effects of non-invasive cortical stimulation on skilled motor function in chronic stroke.*

BRAIN

2005;128:490-99.

### DOCTOR-PATIENT RELATIONSHIP: Forensic Psychiatry for chronic illness?

Having come across this article in the BMJ recently it did strike me of how much I have focused my reading on the "specialist" journals, and am reminded of a Richard Asher quote "...a doctor should be a jack of all trades and a master of one". And no, not as the heading might suggest, forensic psychiatrists are not offering to involuntarily admit all patients with chronic illness (or their doctors for that matter!). These two forensic psychiatrists do however offer some useful insights from the vantage of their speciality that may well have relevance to all of us dealing with patients with chronic illness. How many of us actually regularly reflect on our own feelings and reactions to "chronic" patients? Yet, this can very much affect the therapeutic relationship with the patient and their cooperation and compliance with whatever treatments we may be offering. Do we discuss with our teams how we as a group react to certain patients? Although the article does focus on the importance of these issues in the wider context of undergraduate medical education, it does offer some gems to those of us at a later stage of medical education. It reminds me of the importance of the first part of that old cliché "...the art and science of medicine". - *JMcF*

**Campbell C, McGauley G.**

*Doctor-patient relationships in chronic illness: insights from forensic psychiatry.*

BRITISH MEDICAL JOURNAL

2005;330:667-70.

### NEUROSURGERY: Head injury: craniectomy for ICP reduction

Management of raised intracranial pressure (ICP) following severe head injuries continues to be of major concern for neurosurgeons and intensivists. Brain oedema may continue to progress for hours or days after the initial insult and various strategies have been explored in an endeavour to control the resultant rise in ICP. Head elevation, osmotic diuretics, CSF drainage and hyperventilation have been employed to reduce the volume of the intracranial contents; attempts have been made to reduce cerebral metabolism by inducing hypothermia or by barbiturate administration; in addition to removal of extra-cerebral or intra-parenchymal haematomas some surgeons have performed 'internal decompression' in which a significant volume of brain parenchyma is excised, thereby providing space which swollen brain may occupy. Despite these various attempts to influence the natural history of the condition the outcome from serious head injury remains a major cause of death and serious morbidity in children and young adults. With this background it is unsurprising that even more radical approaches to the management of raised ICP have been explored, including decompressive craniectomy, a procedure which is now gaining momentum in some centres. The procedure (both unilateral and bilateral craniectomy) is described in great detail and with clear illustrations in a recent issue of *Operative Techniques in Neurosurgery*. Careful description is made of the incisions required to preserve a good blood supply when resecting the scalp in order to expose large areas of cranium and of pitfalls to be avoided so as not to cause the swollen brain to sustain further injury on sharp craniectomy margins. The problem of postoperative hygroma formation is described, as is the method of storage of the bone flap in the anterior abdominal wall. The authors concede that evidence for the efficacy of the procedure is anecdotal and present no data of their own to justify its use but do provide a suggested list of indications which include "mechanisms of injury, age, degree of underlying cerebral swelling atrophy, or both; and the surgeon's estimation of the likelihood that the patient will develop severe intracranial hypertension" - and this is really the nub of the problem. Until such time as a properly controlled study is conducted we will remain in the dark as to whether or not this invasive procedure has any part to play in the management of severe head injuries. If, however, it does find a regular and justified place in the surgical repertoire I shall probably turn to this article to learn the tricks of the trade. - *RR*

**Holland M, Nakaji P.**

*Craniectomy: Surgical Indications and Technique.*

OPERATIVE TECHNIQUES IN NEUROSURGERY

2004;7(1):10-15.