

Journal Watch – The Webmaster

Changing your mind

Plasticity is the ability of the brain to be shaped by experience. Until recently this was difficult to demonstrate at an anatomical level. In a landmark (in my opinion) study, Keller and Just demonstrated positive changes in cortico-cortical white matter tracts due to a remedial intervention.

They examined whether 100 hours (6 months' worth) of intensive remedial instruction affected the white matter of eight to ten year old poor readers. They used a diffusion tensor imaging method which showed improved organisation (lower fractional anisotropy) after the reading programme. This correlated with increased myelination and improvement in phonological decoding ability.

They used three programs focusing on phonemic decoding and one which focused on sight word reading and all showed a positive effect. The intensity of delivery (50 minutes/day, 5 days a week) put it out of the reach of many children.

It will be interesting to see if the effects are long lasting.

Keller T.A., Just M.A. *Altering Cortical Connectivity: Remediation-Induced Changes in the White Matter of Poor Readers*. Neuron. Dec 2010; 64 (5): 624 – 631.

What is Normal?

The book *How Doctors Think* (Boston: Houghton Mifflin, 2007) by Jerome Groopman of Harvard Medical School, should be read by all practitioners. His thoughtful essay on the difficulty of diagnosing bipolar disorder in young children is also required reading, especially after the death of four year old Rebecca Riley, probably from a combination of anti-psychotics and clonidine.

He makes the point that it is very difficult to make the diagnosis in a child less than six years of age and only slightly less so in those younger than twelve, because of the constant environmental and interactional changes which can trigger rapid mood swings.

There seems to be a group of children with a primary diagnosis of ADHD who have very poor emotional regulation, but unless there is definite evidence of grandiosity, goal directed behaviour and decreased need for sleep, we should be wary of the diagnosis of bipolar disorder.

He also discussed the possibility that popular books, magazines and advertisements may let parents feel insecure about their children's behaviour and to look for an easy biological explanation and solution.

It is interesting that one new category proposed in the DSM V is temper regulation disorder with dysphoria, which may be a better temporary holding place for some of the young children now labelled as bipolar.

Groopman J. The New Yorker, April 9 2007: 28 – 33.

www.dsm5.org

And which one should you believe?

Two recent studies evaluating the use of hyperbaric oxygen in autism came to directly opposing conclusions. Evaluating them and reading commentaries about them has a lot to teach about the scientific process and the fact that the peer review system can have flaws, which usually will be corrected by further studies and critique. The study with the positive outcome was done by a group actively involved in treating children and essentially compared two placebos (hyperbaric oxygen at 1.3 atm, 24% oxygen vs. slightly pressurised room air). Their evaluation involved a within-group comparison and, if you analyse the final difference, both groups improved, without a statistical difference between them.

We should have a way to advise our patients on complementary and alternative medication, carefully monitoring those who may be effective, but with unknown side effects and dissuading them from using those which are probably ineffective and possibly dangerous (like hyperbaric oxygen therapy).

Rossignol D.A., Rossignol L.W., et al. *Hyperbaric treatment for children with autism: a multicenter, randomised double-blind, controlled trial*. BMC Pediatr. 2009. Mar 13; 9: 21

Granpeesheh D., Taibox J., et. al. *Randomised trial of hyperbaric oxygen therapy for children with autism*. Research in Autism Spectrum Disorders. 2010; 4 (2): 268-275

Dr Google and the needle in the haystack

Diagnosing rare diseases is always a challenge, especially when the tell-tale signs or “handles” are incomplete. There are now resources which can be searched e.g. rarediseases.info.nih.gov or www.rarediseases.org.

Surprisingly, merely googling your patients symptoms and signs may generate a sensible differential diagnosis. A recent article in Archives describe how two parents made the correct diagnosis of a lysosomal storage disorder. The parents of an eleven year old seen by many physicians entered just three terms namely unexplained recurrent fever, pain in feet and skin rash. They recognized the picture of a skin rash of a patient with Fabry disease to be similar to their child’s and so made the correct diagnosis!

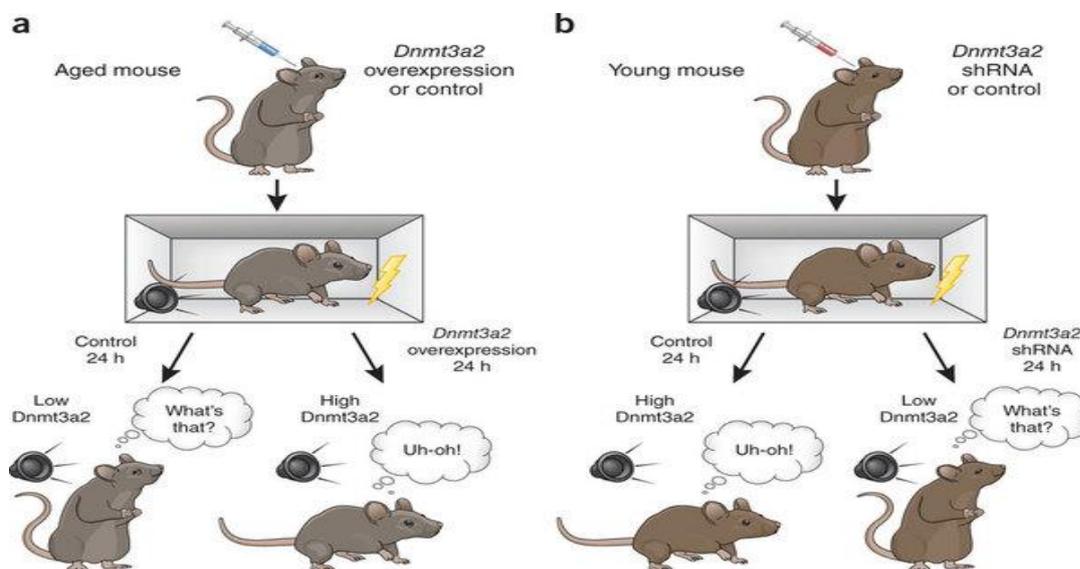
Bouwen MG, Teunissen QGA et.al., “*Doctor Google*” ending the diagnostic odyssey in lysosomal storage disorders. Arch Dis Child 2010; 95: 642-644

Jinnah, H.A . *Needles in haystacks: The challenges of rare diseases*. Developmental Medicine and Child Neurology, 2011, 53: 5-11

Teaching old mice new tricks

The adage “use it or lose it” is true for the prevention of age-related cognitive decline; physical activity, mental stimulation, diet and general health are all involved.

Obviously, the underlying molecular pathways, and especially epigenetic mechanisms, are of huge interest. Oliviera and colleagues found a DNA methyltransferase involved in age-associated mental decline in mice. Much more interestingly, they found that upregulating the enzyme restored cognitive function.



Oliviera, A.M.M. Et al. *Nature Neuroscience*. 15, 1111 – 1113 (2012).

For the inner geek: living in the cloud

Some smartphone applications to improve your practice

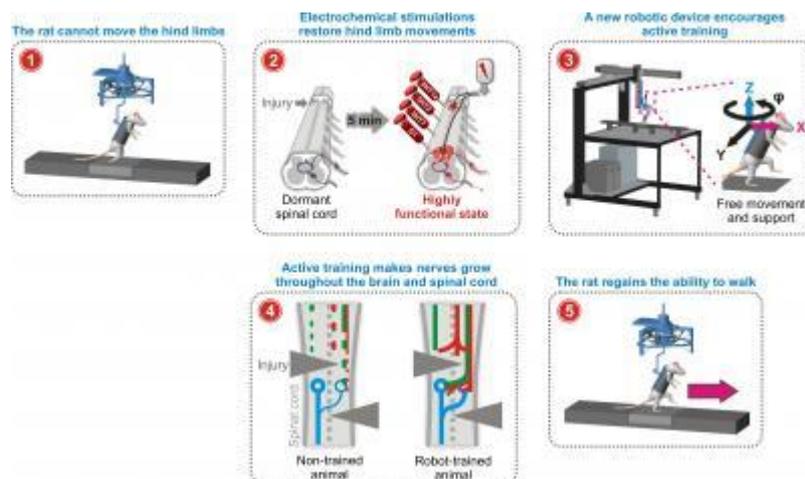
1. **File organisation:** Dropbox creates a folder on your electronic devices. Data you drop in this folder is synched with a server in the so-called “cloud” and can be accessed from different places.
 - 1.2 Users of Logmein can access work computers from home, which can be useful for working in different locations.

2. **Information capture:** Because ideas pop up unexpectedly, Evernote enables you to immediately archive things you see, hear or think. It is an especially useful companion during conferences.
3. **Time management:** This remains a challenge to a busy physician. The application called “Remember the milk” allows users to accomplish the main time management principles namely, collect, process, organise, review and do.
4. **Password management:** Remembering strong passwords for all our subscriptions is a challenge to the middle-aged mind. KeePass, ewallet, 1Password and Roboform are all applications which safely store passwords on laptops (but you must remember your master password!).
5. **Staying current with news and journals:** Reeder allows you to connect with Google Reader on i-devices. Instapaper is useful, as it allows you to save articles for future reading. Downcast does the same with podcasts.

Motivation is the key

We know the definition of a drug being that of something that produces a scientific paper when injected into a rat. There are, however, fascinating research done on rodents, which, if replicated and applied, may bring real hope for the afflicted. Gregoire Courtine and colleagues partially transected the spinal cords of rats, and then attached a stimulation device to the cord, giving electrical pulses or pulses of neurotransmitters.

This enabled their animals to run on treadmills, but when he involved the brain by motivating via food dangled in front of the rats, it caused a permanent recovery and showed that each rat grew new nerves, running from the brain via the break in the spinal cord to the legs. If this can be done in humans, many people's lives will be easier.



Science 336, (2012). *Restoring voluntary control of locomotion after paralyzing spinal cord injury.*

Science Translational Medicine (<http://scim.ag/skannan>)

Reading, writing, Ritalin

Whether stimulant-use has measurable long-term effects has always been a bone of contention. A new study shows that early consistent treatment seems to matter for longer-term academic progress in children with ADHD.

Dr. Helga Zoega linked data from the Icelandic medicines registry and the database of scholastic examinations for 11 872 children. Their key finding was that kids medicated for ADHD fare worse than typical peers over time (especially in mathematics), but children who started medication soonest after the fourth grade test showed a smaller decline in performance.

The bottom line may well be: "If you cannot reach the child, you cannot teach the child."

Pediatrics 2012; 130: e53-e62. A population-based study of stimulant drug treatment of ADHD and Academic Progress in Children.

Spare the Rod and Support the Child:

It is interesting to note that the chattering classes still debate the pros and cons of physical punishment. Professionals now have a summary of 20 years of research on physical punishment that shows that it harms children's long-term development.

Dr. J. Durrant summarised this research in the Canadian Medical Association Journal (online Feb 6 2012). The critical question is whether aggressive children tend to elicit more physical punishment, so the best studies control for the initial profile. There is no study that demonstrates a decrease in aggression, something which should be true if spanking was effective. Dr. Durrant feels physicians should be familiar with methods of positive discipline and she wrote a guidebook 'Positive Discipline: What it is and how to do it', available free of charge on the Internet.

There are enough studies showing the effects of toxic stress (that is, stress without the buffering of parental support) on the developing brain. A new study that focused on positive outcomes turned the issue on its head to show that hippocampal volume actually increases as a function of increases in maternal warmth.

