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Kaleidoscope

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Mindfulness is certainly popular, a suggested panacea for many aspects of mental health, but how effective is it? Mindfulness-based cognitive therapy (MBCT) is a derivative of this, and Kuyken *et al*[1] undertook an individual patient data (IPD) meta-analysis from randomised trials evaluating *relapse prevention* in depression. Those receiving MBCT had a significantly reduced risk of depressive relapse over a 60-week follow-up period against both placebo and alternative active interventions. One strength of IPD analyses is that they allow evaluation of individual factors that can affect outcomes. In this study those with more severe illness showed greatest benefit, but interestingly neither gender nor any other sociodemographic or illness factor affected outcomes. MBCT combines mindfulness training with a cognitive approach, teaching skills to target psychological mechanisms involved in depressive relapse; these data support its efficacy in preventing relapse – including superiority over antidepressants.

Having a hot bath is a way many of us unwind and de-stress: a bit of DIY mindfulness, if you will. Might this be more effective than we imagine? Janssen and colleagues[2] have undertaken the first placebo-controlled trial of the very novel intervention *whole-body hyperthermia*. Using infrared heating coils, participants with depression had their core temperature raised to 38.5°C for a single session, and showed significant improvement over placebo (non-heating lights). What underpins this seemingly fantastical intervention? Cutaneous warmth feels good, and it does seem to increase activation in the dorsal raphe nucleus (which contains serotonergic neurons). As summer heats up, perhaps it is time for some field trials, but do apply sunscreen.

What alters prejudice? In the USA, some state legislative changes are repealing the rights of transgender individuals; will this adversely affect how they are treated by others? Broockman & Kallah highlight in *Science*[3] that intergroup prejudices are typically deeply ingrained from childhood, and mass media interventions tend to have temporary and limited effects. Might brief face-to-face interventions produce more effective and lasting change? A total of 1825 registered voters were recruited after an online survey; unannounced door-step canvassers, who said they were from an LGBT organisation (and those who were transgender stated this), used a short 10-minute intervention and followed up attitudes at 3 days, 3 and 6 weeks and 3 months. The intervention suggested to participants that they might face a vote on repealing laws protecting transgender rights, and solicited their views. The term transgender was explained, and participants were shown a video presenting two perspectives on this debate. Participants were then asked to talk about a time they were judged negatively because of a perceived difference from others; finally, they were asked whether the whole exercise had changed their original answers on the law and for tolerance of transgender identity. The placebo arm consisted of a conversation about recycling.

Just over 500 of those canvassed were followed-up in online surveys; the initial intervention had dramatic effects on attitudes, exceeding those shown for previous studies for interventions on attitudes to lesbian, gay and bisexual people; strikingly, the effect persisted at the 3-month survey. On the issue of legislature protecting transgender rights, initially there was no effect compared with placebo, but a definition of transgender identity was introduced at the 6-week survey, and at 3 months the intervention group were more likely to support laws protecting transgender rights. Direct face-to-face encounters where we challenge others to take the perspective of a stigmatised group appear to have a valuable role in changing attitudes; a reminder that it's the small everyday encounters that make a difference.

Early intervention psychosis (EIP) services are well established, with an evidenced rationale for rapidly targeting and engaging appropriate individuals. But what are the factors that might help or hinder this? Casey and colleagues[4] looked at sociodemographic factors and individual beliefs in just over 100 patients with first-episode illness. Ethnicity, gender, age and socioeconomic factors were *not* significantly correlated with engagement; however, patients with *no* qualifications were better engaged than those educated to a higher level. There is no obvious explanation for this somewhat counterintuitive finding, although patient 'compliance' and more assertive focus by teams on increasingly disadvantaged individuals are proposed as possibilities. Regarding illness factors, duration of untreated psychosis was also *not* a significant factor, but beliefs that mental ill-health was caused by social stress or 'thinking odd thoughts' predicted better engagement; the authors suggest that social attributions might be more destigmatising for people. Disengagement from psychosis services can have a high societal cost, and these latter clinical factors are suggested as targets for EIP services.

Thinking with your stomach? A plethora of television commercials about 'good' and 'bad' bacteria have raised awareness of gut microbes and boosted yoghurt sales. There is increasing interest in how the gut biome influences behaviour, though such an association has long been recognised. An expert review by Rogers and colleagues[5] explored the evidence on how modifications of this microbiome can induce psychopathological effects (including the – uncommon but established – link between antibiotic consumption and a range of psychiatric sequelae). Bacterial fermentation of dietary carbohydrates modulates intestinal neurotransmitters, immunomodulatory metabolites and short-chain fatty acids; these, in turn, impact upon autonomic tone and a range of cytokines that directly communicate with the brain. This gut–brain axis is bi-directional, with changes in behaviour and mental state able to change bacterial composition, suggesting a complex feedback loop in instances of so-called *dysbiosis*. Fascinatingly, increasing gut dysbiosis across the life-span may mediate some chronic low-grade inflammation that negatively impacts upon *cognition*, which potentially supports the vernacular of having s*** for brains.

So, special brainy yogurt for improved cognition or mental health? Evidence suggests not at present, and commercial hype often overtakes evidence in this arena. Several nutrients have established roles in neurobiological processes, although recently omega-3 supplements were not shown to be successful as pro-cognitive agents.[6] Sarris *et al*[7] carried out a meta-analysis of the best current evidence in depression. Positive results were found for augmentation with S-adenosylmethionine (SAMe), methylfolate, omega-3 and vitamin D, with mixed data on other agents, including vitamin C, zinc and folic acid. A broader unanswered question is whether benefits are only seen in those with relevant deficiencies or in specific illness subtypes. Furthermore, while the agents were well tolerated (although folic acid and omega-3 may be contraindicated in individuals with cancer), before we all rush out to health food stores the authors caution

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that there was notable study heterogeneity and funnel plot asymmetry suggests considerable study biases.

Cannabis and psychosis: what is the direction of causality and how do we exclude significant confounding variables? Bechtold and colleagues[8] followed up >1000 adolescent boys, monitoring cannabis use and symptomatology annually between the ages of 13 and 18 years. The level of subclinical psychotic symptoms rose in a linear cumulative manner of about 20% for every year of drug use, with the odds of experiencing paranoia and hallucinations increasing by 133% and 92% respectively. Uniquely, this study was able to evaluate periods of drug abstinence: even after stopping drug use for a year, the effect on symptoms persisted. The findings were supported even after controlling for confounders such as alcohol and other drug use, and there was no evidence of reverse causality (symptoms provoking self-medicating cannabis use).

Promoting smoking cessation is a priority for all healthcare professionals; in mental health we face the additional challenges of higher smoking rates – especially in psychosis – and concern about potential neuropsychiatric sequelae from the drugs varenicline and bupropion. There had previously only been indirect comparisons with nicotine patches, but Anthenelli *et al*[9] report on their double-blind, triple-dummy, placebo- and active-controlled randomised 'EAGLES' trial. Over 8000 participants across 16 countries – about half of whom had positive psychiatric histories – were monitored over 12 weeks of intervention and a further 12 weeks of follow-up. Both bupropion and the nicotine patch were more effective than placebo, and varenicline was superior to all of them; the odds ratios for efficacy did not differ as a function of psychiatric status, the first time that this has been shown. Positively, there was no increase in neuropsychiatric events on varenicline or bupropion. This, the largest study of its kind and the first three-drug head-to-head, appears to have ended the argument about serious adverse mental health events from these interventions.

Where does language sit in the brain? Huth *et al*[10] describe a study where participants listened to hours of natural language story-telling while undergoing functional magnetic resonance imaging (fMRI); they then used dimensionality reduction and predictive techniques to produce a map of cortical selectivity to semantics categories. First, given that words with similar meanings tend to co-occur in streams of language, they constructed 985 semantic features from a large corpus of English texts. Studying each brain voxel across the cortex of seven participants, they isolated four dimensions that explained most of the variance across all participants' voxel-level responses.

It transpires that the first dimension (which explains most variance) spans more social through to perceptual/quantitative semantic categories. Huth and colleagues then mapped the activations to categories, and then to words belonging to those categories, and *vice versa* – enabling whole-brain visualisation of patterns of semantic category representation across the frontal, temporal and parietal cortex. The study uses stories – narrative streams of meaningfully related words – demonstrating a bilateral distribution of semantic categories, which the authors suggest is contrary to lesion studies that suggest left-lateralisation typically using single-word stimuli. For these English-speaking study participants, there was a consistent mapping of anatomy with semantic category suggesting some 'hardwiring'. It remains an open question as to whether this substrate is culturally modified by learning and experience in other languages and cultures. The *Nature* webpage provides a helpful animation of the findings, and the authors provide free access to their interactive atlas (http://gallantlab.org/huth2016/).

Finally, her name is RiO. We hypothesise that the growth of electronic patient records has provoked occasional existential crises in all readers, wondering whether the exponential increase in data collection has resulted in improved care. An editorial in *The Lancet*[11] asks the provocative question, what are our modern medical records for? Martin & Sinsky posit that excessive documentation, and the focus and time this takes (which they cuttingly label 'technogovernance'), strains our workload, our relationships with patients, and leads to clinician burnout. They argue that there needs to be a shift in thinking to make electronic patient records fit for purpose – so that they do what they were originally designed for: aiding cognition and communication, mapping longitudinal comprehensive care, and supporting clinical decision-making. They note a particular dearth in patient-relevant outcome measurements among the myriad mandatory markers, especially as electronic records were heralded as harbingers of improved *quality* of care. They propose ways to sharpen practice, which pleasingly include more of a patient voice and social history – the axe falls on meaninglessly repeated information (the notorious copy-and-paste) and data captured when they do not add utility. An interesting push is for open patient access to their own notes, and indeed the ability to contribute to one's own health records; a unique challenge in mental health, but not one without positive possibilities. The records are only what we make of them; it is our job to be smart in getting them to produce meaningful outcome data. The Duran Duran song of the same name[12] promised 'and when she shines she really shows you all she can'; here's hoping.

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