

Better health outcomes for OSA using the Flinders Chronic Disease Management Program
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Introduction: Obstructive Sleep Apnea (OSA) is a chronic disease with long term complications. OSA is a disease more prevalent in men and seen in higher prevalence amongst Veteran populations. Medical management of OSA includes CPAP to maintain airway patency. An additional program targeting factors contributing to OSA, comorbidities and lifestyle factors, including weight loss as a goal, could reduce excessive daytime sleepiness and improve other health outcomes. The intent of this pilot project was to evaluate the feasibility and acceptability of using the Flinders Program to target risk factors, as well as manage chronic disease in patients with OSA

Methods: Adelaide Institute for Sleep Health Physicians recruited patients with moderate to severe OSA ($AHI \geq 30$) between 09/2010 and 11/2010. At the initial appointment they were asked to complete baseline questionnaires (demographics, HADS, ESS, PACIC) and then they commenced the Flinders program with a trained clinician: this included jointly creating a care plan and identifying and setting goals with the intention of improving tenacity and motivation with OSA therapies as well as other problems and comorbidities. Referrals were provided to a commercial meal replacement program and health resources as required. Contact was maintained by a clinician to support behaviour change and participants attended two additional appointments at six weeks and four months later.

Results: Eleven patients agreed to participate and nine patients completed the study. At Baseline: mean weight 116.0 kg (SD 33.1); mean BMI 39 (SD 8.2); mean waist circumference 126 cm (SD 18.7); mean ESS 8.5 (SD 4.6); mean HADS Anxiety 7.5 (SD 2.8) and Depression 5.5 (SD 3.2); mean PACIC 2.44 (SD 0.77). At the 4 month follow up the average weight change was -8.8 kg (SD 8.8) with an average change of 3 in BMI (SD 2.2). Patients also reported being less sleepy with an average change of -2.9 points (SD 4.1) in ESS and more satisfied with their chronic illness care with an average increase of 1.4 (SD 0.7) measured by PACIC. Their scores for depression and anxiety also improved (HADS Anxiety -3.1 SD 3.6, Depression -4.2 SD 3.9).

Conclusions: Most patients completed the program and there were notable improvements in weight, sleepiness and satisfaction with chronic disease care. The pilot project showed the Flinders Program to be a feasible and acceptable program to target risk factors as well as lead to better health outcomes in OSA

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Implementing Strategies To Reduce Sedative And Anticholinergic Load Among Older People With Dementia: The Veterans' Mates Program
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Purpose: People with dementia are susceptible to cognitive impairment associated with sedative and anticholinergic medicines. Recognising that sedative and anticholinergic medicines are widely prescribed, the Australian Government Department of Veterans' Affairs (DVA) Veterans' Medicines Advice and Therapeutics Education Services (Veteran's MATES) implemented an Australia wide intervention in December 2010. The objective of this study was to explore prescriber experiences in relation to sedative and anticholinergic medicines.

Method: The intervention comprised (1) patient-specific feedback for 5,084 general practitioners (GPs) supported by a therapeutic brief highlighting key clinical issues, and (2) an educational brochure for 3,076 veterans taking sedative or anticholinergic medicines. In conjunction with the intervention, GPs were encouraged to complete a one-page survey in relation to their prescribing experiences. Survey items related to consideration of cognitive impact prior to prescribing a new medicine, whether addition of a sedative or anticholinergic medicine causes cognitive decline, and ease of being able to avoid sedative or anticholinergic medicines. The face-validity of the survey instrument was pre-assessed by the Veterans' MATES Editorial Committee. No reminders or repeat mailings were sent. All responses were analysed using SAS (Version 9.2, NC, USA).

Results: Among the 310 GP respondents, 250 (80.7%) reported that they always consider the cognitive impact prior to prescribing a new medicine to a patient with dementia. However, 165 (53.2%) respondents reported that in their experience addition of a sedative to the medicine regimen resulted in mild or no cognitive decline. Correspondingly, 202 (65.2%) of GPs reported that addition of an anticholinergic to the medicine regimen resulted in mild or no cognitive decline. GPs who reported that it was not easy or slightly easy to avoid prescribing sedative or anticholinergic medicines to their veteran patients were more likely to report that sedatives ($\chi^2=10.85$, $p=0.001$) or anticholinergics ($\chi^2=9.84$, $p=0.002$) caused only mild or no cognitive decline.

Conclusions: Many GPs do not perceive a high likelihood of cognitive decline associated with sedative and anticholinergic medicines. In keeping with behavioural theories, education to raise awareness of these adverse events may be required prior to or as part of interventions to improve practice.

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Molecular characterization of the dipeptidyl peptidase 10 (dp10) short Isoform: its pathological link to alzheimer's disease

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Background: Dipeptidyl peptidase 10 (DP10) is a type II transmembrane protein with a short cytosolic N-terminal segment and a large extracellular C-terminal domain. DP10 belongs to the dipeptidyl peptidase IV family of atypical serine proteases, however extensive molecular characterization has revealed it is inability to function as a protease. Since its initial discovery it has been found that DP10 is a critical component in the expression and modulation of the Kv4 channels accounting for a large portion of the somatodendritic inactivating current in neurons in regulating firing frequency and signal processing in dendrites¹. Recently an increasing number of publications suggest that potassium channels or their associated proteins might be involved in steps leading to the neurodegeneration observed in Alzheimer's disease². Here we examine the short isoform of this protein (DP10-s) expression in human brains and its involvement in Alzheimer's neurofibrillary tangles and plaques.

Methods: Rabbit antibodies were raised against the N-terminal sequence of DP10-s and affinity purified. Antibody specificity was confirmed by antigen absorption and blocking. Immunocytochemical and immunoblot analysis were conducted in 20 aged human brains affected with or without Alzheimer's and other neurodegenerative diseases.

Results: Immunocytochemical analysis revealed predominantly neuronal staining of DP10-s throughout the neocortex and subcortical grey matters with high expression in the pyramidal cells in normal brain tissue. In Alzheimer's brains, robust DP10-s reactivity was detected in neurofibrillary tangles and plaque-associated dystrophic neurites. Confocal microscopy revealed colocalisation of DP10-s with tau protein – one of the pathological hallmarks of Alzheimer's disease in most tangles and dystrophic neurites, but some DP10-s positive neurons with relatively normal morphology were tau negative. Occasional DP10-s positive neurons were seen in some aged normal brains. This suggests DP10-s may mark early cellular changes of the dementia. Western blots revealed that DP10-s ran as full length about 100kD, as well as the 37kD and 50kD in homogenised brain samples. The 37kD and 50kD forms increased significantly in

AD brains compared to normal brains, suggesting the truncated DP10-s forms might be involved in the formation of neurofibrillary tangles and dystrophic neurites. Transient transfection of DP10-s into Tau stable expressing SH-SY5Y cells results in a degenerative phenotype including DP10-positive inclusions often colocalizing with phosphorylated tau, cellular vacuolization, nuclear outline blurring or irregularity, fragmentation or shrinkage. Over expression of both DP10789aa and Tau40 proteins in 293T cells resulted in Tau phosphorylation. Conclusion: DP10-s is highly expressed in human brain, its robust presence in tangles and dystrophic neurites suggests its involvement in pathology of Alzheimer's disease.

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A Randomised Controlled Trial To Evaluate A Simplified Model Of Care For Obstructive Sleep Apnea In General Practice

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Introduction: Obstructive sleep apnea (OSA) is highly prevalent in the Veteran population, with its major risk factors being male gender, increasing age, obesity and excessive alcohol intake. There has been growing interest in ambulatory models of care for OSA involving screening questionnaires, portable home monitors and/or auto-titrating continuous positive airway pressure (CPAP). With appropriate training and provision of simplified management tools, general practitioners (GPs) are ideally positioned to take on a greater role in the diagnosis and treatment of OSA. The aim of this randomised controlled study was to compare a simplified model of care for OSA in the primary care setting versus the usual standard of care in a specialist sleep centre.

Methods: Patients with symptomatic, moderate-to-severe OSA were identified by GPs using a 4-item screening tool, the Epworth sleepiness scale (ESS) and home oximetry (ApneaLink, ResMed). Eligible patients were randomised into either one of two models of care: (1) General practice-based care, with management led by their GP and a

community-based nurse, involving home auto-titrating CPAP, or (2) Usual care in a specialist sleep centre, involving sleep physician management and laboratory-based testing. Outcome measures included the change in ESS, change in functional outcomes of sleep questionnaire (FOSQ) and CPAP compliance after 6 months of follow-up.

Results: 155 patients were randomised into the study. For the primary outcome measure, the mean change in ESS score at 6 months, GP-based care was not inferior to Specialist-led management (4.9 vs 5.1; adjusted mean difference -0.5 [lower bound of one-sided 95% confidence interval (CI): -1.6], $p=0.47$) using an a priori noninferiority margin of -2.0. Similar results were also seen for the mean change in FOSQ score at 6 months (2.3 vs 2.7; adjusted mean difference -0.06 [lower bound of one-sided 95% CI: -0.6], $p=0.87$) using an a priori noninferiority margin of -1.0. CPAP compliance at 6 months was comparable in the two treatment arms, with mean (\pm SD) daily use of 4.8 (\pm 2.1) hours in the GP-led group versus 5.4 (\pm 1.8) hours in the Specialist group ($p=0.1$).

Conclusions: Outcomes for patients with symptomatic, moderate-to-severe OSA managed in primary care using a simplified, ambulatory approach which utilises the skills of appropriately trained GPs and community-based nurses are not clinically inferior to usual management in a specialist sleep centre. A model of care for OSA based in the general practice setting has the potential to reduce waiting lists for sleep services and to minimise the burden of disease for Veterans and the wider community.

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An Examination Into The Positive Psychological Outcomes Of An Intervention To Promote Forgiveness Through Written Disclosure

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A thesis submitted in partial fulfilment of the requirements for the degree of Bachelor of Psychology (Honours) at the University of South Australia October 2007.

Purpose of the study: The aim of this study was to examine the extent to which an expressive writing exercise promoting forgiveness would be associated with improvements in the psychological health of war veterans. The study also examined one of mechanisms of change proposed to assist in the resolution of trauma experiences, cognitive processing. It was hypothesised that:

Hypothesis 1: A forgiveness intervention will lead to decreases in depression, anxiety and stress and increases in forgiveness.

Hypothesis 2: A forgiveness intervention will lead to increased cognitive processing about a stressful experience, as measured by the increases in number of cognitive mechanism words used to describe a forgiveness situation and the Cognitive Processing of Trauma measure.

Hypothesis 3: That increases in cognitive processing will be related to decreased depression, anxiety, stress and increased forgiveness.

Method: Seventeen adult male participants from the Returned and Services League of Australia (RSL) in Adelaide, Australia participated in an uncontrolled pre-test/post-test study over a period of five weeks. Participants were asked to spend twenty minutes each week for five weeks, journaling about a stressful war experienced using guided instructions which promoted forgiveness. Participants also completed self report pre-test and post-test measures examining psychological wellbeing (depression, anxiety and stress), dispositional forgiveness, state forgiveness and cognitive processing of a trauma. Specialised computer software designed to measure cognitive processing by

characterising the grammatical linguistic and psychological features of text documents was used to examine the participants' journal entries to obtain objective measures of cognitive processing.

Summary of results: Changes following the intervention were observed on a range of measures of psychological wellbeing, including depression, anxiety and stress, forgiveness and cognitive processing.

Conclusions: It is thus concluded that although further controlled evaluations are required, the written disclosure intervention may provide a useful adjunct to war veteran treatment.

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Aeromedical disposition of aircrew medical employment classification reviews, 2000-2009

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Purpose: The RAAF Institute of Aviation Medicine is responsible for the aeromedical disposition of all ADF aircrew, performing 519 Aircrew Medical Employment Classification Reviews (AMECRs) during the 10-year period 2000 to 2009. The casemix and outcomes of ADF aircrew undergoing medical board have not been explored to date. This paper describes the first structured review of the casemix passing through AVMED for medical board review, in an effort to inform

the aircrew-health training AVMED provides and to help shape preventative health measures relevant to the preservation of the ADF's aviation capability.

Method: The database of Central and Institute AMECRs was reviewed. First-listed clinical information was grouped into diagnostic categories, and described in terms of the casemix for the aircrew presenting for review, as well as those who were 'grounded' permanently. The data was further evaluated in terms of pilot and non-pilot aircrew.

Results: During the period January 2000 to December 2009, AVMED reviewed 519 AMECRs, comprising 435 individuals. The majority were pilots (44%), followed by Air Combat Officers (4%) and Loadmasters (12%), and Navigators (7%). The five conditions most commonly listed first as the reason for requiring AMECR were: back pain (9%), mood disorder (8.5%), migraine (4.5%), PTSD (3.5%), and neck pain (3%). Of the first-listed conditions, musculoskeletal injuries accounted for 23% and mental health issues accounted for 17% as reasons for AMECR. The five conditions most commonly listed first as the reason for permanent disqualification from flying were: back pain (12%), mood disorders (6%), migraine (5%), knee pain (4%), and leg pain (4%). Pilots accounted for only 44% of all AMECRs, but accounted for 70% of neck pain, and 60% of knee injuries. Conversely, loadmasters accounted for only 13% of all AMECRs, but 30% of all back pain cases, 20% of mood disorders, and 20% of shoulder injuries. When compared to pilots, loadmasters appear to be 2.5 times more likely to have AMECR because of back pain, and 3 times more likely to have AMECR because of a mood disorder. Overall, 60% of pilots and loadmasters were permanently grounded because of medical and surgical conditions, and 20% for back pain. Mental health accounted for 15% of loadmasters but only 5% of pilots who were permanently grounded, and musculoskeletal injuries (excluding back and neck) accounted for 30% of permanently-grounded pilots but no loadmasters.

Conclusions: This research suggests that musculoskeletal injuries and mental health disorders are the two most common reasons for bring aircrew to MECR, and are also the most common reasons for permanent grounding. The research also suggests that different aircrew roles may have a different injury/illness pattern, and this may inform future research or health education initiatives.

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Abdominal Compression Increases Obstructive Sleep Apnoea Severity

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Purpose of study: Obstructive sleep apnoea (OSA) is the most common pathological breathing disorder in sleep and is characterised by repetitive periods of upper airway collapse and often severe oxygen desaturation. These respiratory events are frequently associated with arousals that disrupt sleep, such that OSA patients commonly report excessive daytime sleepiness, which increases the risk of motor vehicle and work-related accidents. OSA is common in the general population and in the Veteran community^{1,2} and is likely on the rise along with population trends in obesity. Male gender and obesity are the main risk factors for OSA, but the underlying mechanisms remain poorly understood. One mechanism promoting airway collapse in obese males may be increased intra-abdominal pressure, due to abdominal obesity, which leads to diaphragm elevation and reduced tracheal "stretch" on the upper airway. The aim of this study was to test the hypothesis that raising intra-abdominal pressure, via external abdominal loading, increases OSA severity measured during sleep from the apnoea-hypopnoea index (AHI) in male OSA patients.

Methods: Overweight-to-obese (body mass index [BMI] 25-40 kg/m²) males with mild-to-moderate OSA (AHI 15-45 events/hr), between the ages of 18-65 years were recruited. Patients wore a nasal mask fitted with a pneumotachograph to measure nasal airflow and volume. Posture remained fixed within each patient. Two balloon catheters were used to assess gastric and oesophageal pressure (Pga and Poes), while transdiaphragmatic pressure (Pdi) was calculated as Pga-Poes.

Abdominal compression was achieved via inflation of a pneumatic cuff wrapped around the abdomen. Three cuff conditions were examined; deflated, intermediate (mid) and maximum inflated level believed tolerable during sleep. Cuff condition was changed in random order every 10 minutes during sleep. AHI during stage 2 sleep was calculated as the total number of respiratory events divided by total stage 2 sleep time. End-expiratory Pga and Pdi were calculated breath-by-breath for each cuff state during periods of stable stage 2 sleep. End-expiratory pressures and AHI were compared between cuff conditions using ANOVA for repeated measures.

Results: 14 OSA patients successfully completed the study. The mean±SEM age, BMI and diagnostic AHI for the fourteen patients were 51.1±2.9 years, 31.3±1.0 kg/m² and 27.2±2.6 events/hr respectively. Abdominal compression increased end-expiratory Pga

(deflated; 11.1 ± 1.5 , mid; 15.5 ± 1.7 and max; 18.6 ± 1.9 cmH₂O, cuff effect, $p < 0.001$) and end-expiratory P_{di} (deflated; 4.5 ± 2.2 , mid; 7.5 ± 2.7 and max; 9.9 ± 2.8 cmH₂O, cuff effect, $p < 0.001$). Stage 2 AHI increased with abdominal compression (deflated; 34.3 ± 7.3 , mid; 36.9 ± 9.0 and max; 50.2 ± 6.4 events/hr, cuff effect, $p = 0.031$).

Conclusion: This is the first study to show a direct effect of abdominal loading on OSA severity. These data further support that effects of central/abdominal obesity importantly influence upper airway function in sleep.

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Delivery of mental health services to rural veterans using home videophones: a pilot study

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Purpose: The purpose of this study was to determine the feasibility, acceptability and perceived clinical usefulness of delivering mental health services by home videophones to veterans living in rural South Australia. Previous research has shown that video communication is as accurate as in-person assessment for psychiatric review¹, and Porcari has shown that Post Traumatic Stress Disorder (PTSD) can be effectively assessed in a veteran group by videoconferencing². A randomized controlled trial showed that combat-related PTSD can be effectively treated by telepsychiatry, with high satisfaction in recipients³. It was anticipated that a telehealth service may improve veterans' access to care and enhance the capabilities of the RGH Psychiatry Service.

Methods: *Participants* Outpatients of the RGH Psychiatry Services who lived in rural South Australia.

Intervention Participants received a home videophone enabled by 3G connectivity for four months, and RGH staff delivered clinical care delivery by this medium, tailored to each veteran's requirements.

Data collection Staff, veterans, and the technical provider were interviewed, with thematic analysis conducted on the interview transcripts.

Results:

- Five veterans were recruited for the study, and three clinical staff participated.
- The videophone system was judged to be very easy to use, and the call quality was good for four veterans but problematic for one.
- Initial apprehension about video communication resolved rapidly, and at interview some veterans preferred the videophone over face-to-face services because they felt less anxious at home. Veterans repeatedly mentioned that they preferred to avoid travel.
- Staff thought that the videophone was much better than telephone calls but not as good as in-person contact. Clinically, it was reported to enhance case management and improve functioning for three clients with chronic, disabling mental health issues, and staff judged that two hospital admissions had been prevented. One veteran commenced CBT via the videophone and found that he could not obtain the intensity of the therapeutic relationship he felt that he needed to make progress.
- One ethical issue raised was the importance of considering privacy at home.

Conclusions: This small pilot study suggests that home video service delivery has a useful place in case management of rural veterans who are significantly impaired by their mental health conditions. Further implementation and evaluation with a larger group of clients is warranted. The introduction of new telehealth consulting items funded by the Department of Veterans Affairs from July 1st 2011 offers a possible means of sustaining such a service.

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