LIGHTNING TALKS • CLINICAL AND TRANSLATIONAL RESEARCH

[LTC1]

PHYSIOTHERAPISTS' PERSPECTIVES ON THE DESIRED FEATURES, BENEFITS AND BARRIERS OF EXOSKELETON TECHNOLOGY USE IN STROKE SURVIVORS

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Exoskeleton technology is beneficial to boost rehabilitation among stroke survivors. However, its uptake in Malaysia has been slow. The aim of this mixed method study was to obtain physiotherapists' perspective regarding the desired features, benefits and barriers of the use of exoskeleton technology among stroke survivors. An online survey was conducted among 81 Malaysian physiotherapists using an adapted questionnaire regarding the use of exoskeleton technology in stroke survivors. This was followed by an in-depth one to one online interview with physiotherapists (n=5) to gain insights of the benefits and barriers of using this technology for rehabilitation in stroke survivors. The quantitative data was analysed using descriptive statistics. The interviews were transcribed verbatim and analysed using a general inductive approach. The results showed that 90% of the physiotherapists were keen to use exoskeleton technology for rehabilitation among stroke survivors. Cost (93.8%), minimising falls risk (92.6%), battery life (91.4%) and comfortability (90.1%) were rated as the most important desired features of exoskeleton technology. Physiotherapists viewed exoskeleton technology as an assistive device used with standard physiotherapy to enhance rehabilitation in stroke survivors. The highlighted benefits of the use of exoskeleton technology during rehabilitation in stroke survivors included reduced occupational hazards, increased productivity and reduced physical effort among physiotherapists. The use of exoskeleton technology was also perceived to improve physiotherapists' and stroke survivors' motivation for therapy. However, the high cost for purchase and maintenance, comfortability and adjustability to body size were emphasised as the main possible barriers for its use. The findings of this study provide information to inventors, engineers and manufacturers about user-centred key features and characteristics of exoskeleton technology for rehabilitation in stroke survivors locally.

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[LTC2]

A NEURAL NETWORK APPROACH TO OPTIMISING TREATMENTS FOR DEPRESSION USING DATA FROM SPECIALIST AND COMMUNITY PSYCHIATRIC SERVICES IN AUSTRALIA, NEW ZEALAND AND JAPAN

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This study investigated the application of a recurrent neural network for optimising pharmacological treatment for depression. A clinical dataset of 458 participants from specialist and community psychiatric services in Australia, New Zealand and Japan were extracted from an existing custom-built, web-based tool called *Psynary*. This data, which included baseline and self-completed reviews were used to train and refine a novel algorithm using a previously defined threshold value for remission from depression, a fully connected network feature extractor and long short-term memory algorithm were firstly trained in isolation and then integrated and annealed using slow learning rates due to the low dimensionality of the data. The accuracy of predicting depression remission before processing patient review data was 44.08%. After processing 11 reviews (the average number of reviews a patient completed), the accuracy was 80.8%. The medications with predicted best results were Antipsychotics (88%) and Selective Serotonin Reuptake Inhibitors (87.9%). This is the first study that has created an all-in-one algorithm for optimising treatments for all subtypes of depression. Reducing treatment optimisation time for patients suffering from depression may lead to earlier remission and hence reduce the high levels of disability associated with the condition. Furthermore, in a setting where mental health conditions are an increasing strain on mental health services, the utilisation of web-based tools for remote monitoring and machine/deep learning algorithms may assist clinicians in both specialist and primary care in extending specialist mental healthcare to a larger patient community.

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[LTC3]

HOW DO ABNORMALITIES IN THE CEREBROSPINAL FLUID IMPACT NEUROPSYCHOLOGY WITH PROGRESSING AGE?

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Cerebrospinal fluid (CSF) has changing properties throughout life including composition and volume imbalances. However, which abnormality-corresponding behavior prevails at which specific age-group remains unclear. The objective of this article was to briefly explore how such changes reflect on one's psychological as well as physical processing. Prenatally, congenital malformations and infections hold the greatest risk impacting the child's physical and mental growth. In adolescents, transmission of external substances like alcohol or drugs in the cerebrospinal fluid impacting severe mood changes is common - potentially resulting in suicide and depression. In the adult working population, the influence of stress levels on CSF composition causes behaviours like anxiety and sleep disorders. Finally, the reduced production of CSF was found to be associated with memory deficits and Alzheimer's disease in the ageing group.

[LTC4]

RELATIONSHIP BETWEEN FAECAL CALPROTECTIN AND RISK OF FUTURE COLORECTAL NEOPLASIA

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Current British Society of Gastroenterology guidelines recommend surveillance colonoscopy at three years for patients with high-risk polyp findings on index colonoscopy. However, only a minority of patients have subsequent polyps or colorectal cancer identified. Therefore, current surveillance strategies remain to be improved upon. Faecal calprotectin (FC) is a marker of intestinal inflammation associated with colorectal carcinoma and advanced adenomas, hence representing a potential non-invasive marker for stratifying risk of subsequent colorectal neoplasia beyond index polypectomy. Our study examined the relationship between FC concentration at time of index colonoscopy and risk of future colorectal neoplasia, in patients found to have colorectal adenomas within the Scottish Bowel Screening Programme.

Patients included underwent screening colonoscopy in NHS Greater Glasgow and Clyde between January 2016 and June 2017 with adenomas identified on index colonoscopy. FC was collected before bowel preparation, and categorised as <50µg/g, 50-200µg/g or >200µg/g. Subsequent colonoscopy findings were recorded retrospectively, and categorised as normal, polyp, cancer, inflammatory or other pathology. Relationship between FC concentration and risk of future colonoscopy and risk of future colorectal neoplasia (adenoma, advanced adenoma or cancer) was examined.

179 patients were included; 44% (n=79) had a subsequent colonoscopy. 30% of patients had FC 50-200µg/g, and 20% FC >200µg/g; there was no association between FC concentration and risk of future colonoscopy (P >0.05). On subsequent colonoscopy, 36 patients (20%) had a further polyp and 1 patient had colorectal cancer. There was no association between elevated FC concentration and risk of adenoma (P >0.05) or advanced adenoma (P >0.05). The one patient with subsequent cancer had FC >200µg/g.

Our results suggest that FC is not a useful marker to stratify risk of subsequent neoplasia in patients diagnosed with colorectal adenomas within a bowel screening programme. However, our results may be limited by the small number of patients included in this observational study.