Airedale
NHS Foundation Trust

Library Current Awareness Bulletin Stroke – August 2021

This is a current awareness bulletin from the Library & Knowledge Services team at Airedale NHS Foundation Trust. If you have any comments or queries, please do not hesitate to contact us. Our contact details can be found on the final page of this bulletin.

Please note: This bulletin contains a selection of material and is not intended to be comprehensive. Professional judgement should be exercised when appraising the material. The Library & Knowledge Services team takes no responsibility for the accuracy of the information supplied.

Articles can be accessed from the links provided. An OpenAthens account may be required to access some of the articles.

To create your free account, please go to https://openathens.nice.org.uk/

Guidance

Apixaban for preventing stroke and systemic embolism in people with non-valvular atrial fibrillation
NICE Technology appraisal guidance [TA275]
Updated July 2021
[Recommendation 1.2 updated to include the other anticoagulants approved by NICE]

Dabigatran etexilate for the prevention of stroke and systemic embolism in atrial fibrillation
Technology appraisal guidance [TA249]
Updated July 2021
[Recommendation 1.2 updated to include the other anticoagulants approved by NICE]

Edoxaban for preventing stroke and systemic embolism in people with non-valvular atrial fibrillation
NICE Technology appraisal guidance [TA355]
Updated July 2021
[Recommendation 1.2 updated to include the other anticoagulants approved by NICE]

Inducing and maintaining normothermia using temperature modulation devices to improve outcomes after stroke or subarachnoid haemorrhage
NICE Interventional procedures guidance [IPG701]
Published July 2021
[The new guideline explains that this procedure can only be done as part of a research study. This is because there is not enough evidence to be sure how well it works or how safe it is.]

Rivaroxaban for the prevention of stroke and systemic embolism in people with atrial fibrillation
Technology appraisal guidance [TA256]
Updated July 2021
[Recommendation 1.2 updated to include the other anticoagulants approved by NICE]

COVID-19: Impact on Stroke Services

Effect of the COVID-19 pandemic on acute stroke reperfusion therapy: data from the Lyon Stroke Center Network.
Plumereau C., Cho T-H., Buisson M., Amaz C., Cappucci M., Derex L., Ong, E., Fontaine J., Rascle L. et al
Journal of Neurology, vol. 268(7) pp. 2314-2319
Jul 2021
[**Background**: The coronavirus disease 2019 (COVID-19) pandemic would have particularly affected acute stroke care. However, its impact is clearly inherent to the local stroke network conditions. We aimed to assess the impact of COVID-19 pandemic on acute stroke care in the Lyon comprehensive stroke center during this period. **Methods**: We conducted a prospective data collection of patients with acute ischemic stroke (AIS) treated with intravenous thrombolysis (IVT) and/or mechanical thrombectomy (MT) during the COVID-19 period (from 29/02/2020 to 10/05/2020) and a control period (from 29/02/2019 to 10/05/2019). The volume of reperfusion therapies and pre and intra-hospital delays were compared during both periods. **Results**: A total of 208 patients were included. The volume of IVT significantly decreased during the COVID-period [55 (54.5%) vs 74 (69.2%); p = 0.03]. The volume of MT remains stable over the two periods [72 (71.3%) vs 65 (60.8%); p = 0.14], but the door-to-groin puncture time increased in patients transferred for MT (237 [187-339] vs 210 [163-260]; p < 0.01). The daily number of Emergency Medical Dispatch calls considerably increased (1502 [1133-2238] vs 1023 [960-1410]; p < 0.01). **Conclusions**: Our study showed a decrease in the volume of IVT, whereas the volume of MT remained stable although intra-hospital delays increased for transferred patients during the COVID-19 pandemic. These results contrast in part with the national surveys and suggest that the impact of the pandemic may depend on local stroke care networks.]

Drug Therapy / Stroke Prophylaxis

Clinical effects and safety of edaravone in treatment of acute ischaemic stroke: A meta-analysis of randomized controlled trials
Chen C., Chen Y., Li M., Lin L., Chen S., and Hong L.
Journal of Clinical Pharmacy and Therapeutics, vol. 46(4) pp. 907-917
Aug 2021
[**What is known and objective**: Edaravone is a new antioxidant and hydroxyl radical scavenger. Although there is evidence that it improves clinical outcomes of patients with acute ischaemic stroke (AIS), it is not yet widely accepted for treatment of AIS in Western countries. We further investigated the efficacy and safety of edaravone through this meta-analysis of randomized controlled clinical trials (RCTs). **Method(s)**: Pubmed, Embase, Web of Science and Cochrane Library were screened up to December 2020 for original articles from SCI journals that published in English. RCTs that compared edaravone versus placebo or no intervention in adult patients and reported the efficacy or safety of edaravone were regarded as eligible. Mortality was regarded as the primary outcome and the improvement of neurological impairment was regarded as the secondary outcome. Safety evaluation was conducted according to the incidence of adverse events. Review Manager 5.3 was employed to perform the assessment of the risk of bias and data synthesis. The Cochrane risk of bias tool for randomized controlled trials was employed to assess the risk of bias. **Results and discussion**: Seven randomized controlled trials with 2069 patients were included. For the incidence of mortality, the pooled RR for studies that evaluated edaravone after three-month follow-up was 0.55 (95% Cl, 0.43-0.7, I2 = 0, P < 0.01). The pooled RR for improvement of neurological impairment at the three months follow-up was 1.54 (95% CI, 1.27-1.87, I2 = 0, P < 0.01) in four RCTs. On

subgroup analysis of studies that were conducted in Asia, the RR was 1.56 (95% CI, 1.27-1.90, I2 = 0%; P < 0.01); the pooled RR for studies that were conducted in Europe was 1.32 (95% CI, 0.64-2.72; P = 0.45); the pooled RR for studies that used edaravone for two weeks was 1.42 (95% CI, 1.10 to 1.83, I2 = 0%; P < 0.01); the pooled RR for studies that used edaravone for one week was 1.64 (95% CI, 1.24-2.16, I2 = 0%; P < 0.01); the pooled RR for studies that conducted in patients with mean age equal to or over 60 years was 1.52 (95% CI, 1.24-1.87, I2 = 0%; P < 0.01); and the pooled RR for studies that were conducted in patients with mean age less than 60 was 1.80 (95% CI, 1.05-3.08, I2 = 0%; P = 0.03). For the incidence of any treatment-related adverse events, the pooled RR for studies that evaluated edaravone during treatment was 0.83 (95% CI, 0.51-1.34, I2 = 0, P = 0.43). The difference of the incidence of any treatment-related adverse events between two groups was not statistically significant. **What is new and conclusion**: The limited studies indicate that edaravone can improve neurological impairment with a survival benefit at three-month follow-up, regardless of the mean age and course of treatment. It is worthy of promotion in the clinical treatment of AIS in Asian countries. More well-designed RCTs with larger sample sizes are needed to determine the benefits of edaravone in patients from Western countries.]

Neuroscience & Neuroimaging

A scoping review of the association of social disadvantage and cerebrovascular disease confirmed by neuroimaging and neuropathology

Keller S.A., Powell W.R., Bendlin B.B., Kind A.J.H., and Hansmann K.J.

International Journal of Environmental Research and Public Health, vol. 18(13)

July 2021

[Social disadvantage - a state of low-income, limited education, poor living conditions, or limited social support-mediates chronic health conditions, including cerebrovascular disease. Social disadvantage is a key component in several health impact frameworks, providing explanations for how individual-level factors interact with interpersonal and environmental factors to create health disparities. Understanding the association between social disadvantage and vascular neuropathology, brain lesions identified by neuroimaging and autopsy, could provide insight into how one's social context interacts with biological processes to produce disease. The goal of this scoping review was to evaluate the scientific literature on the relationship between social disadvantage and cerebrovascular disease, confirmed through assessment of vascular neuropathology. We reviewed 4,049 titles and abstracts returned from our search and included records for full-text review that evaluated a measure of social disadvantage as an exposure variable and cerebrovascular disease, confirmed through assessment of vascular neuropathology, as an outcome measure. We extracted exposures and outcomes from 20 articles meeting the criteria after full-text review, and described the study findings and populations sampled. An improved understanding of the link between social factors and cerebrovascular disease will be an important step in moving the field closer to addressing the fundamental causes of disease and towards more equitable brain health.]

Exploring the Use of Brain-Computer Interfaces in Stroke Neurorehabilitation.

Yang S., Li R., Li H., Xu K., Shi Y., Wang Q., Yang T., and Sun X.

BioMed Research International

Jun 2021

[With the continuous development of artificial intelligence technology, "brain-computer interfaces" are gradually entering the field of medical rehabilitation. As a result, brain-computer interfaces (BCIs) have been included in many countries' strategic plans for innovating this field, and subsequently, major funding and talent have been invested in this technology. In neurological rehabilitation for stroke patients, the use of BCIs opens up a new chapter in "top-down" rehabilitation. In our study, we first reviewed the latest BCI technologies, then presented recent research advances and landmark findings in BCI-based neurorehabilitation for stroke patients. Neurorehabilitation was focused on the areas of motor, sensory, speech, cognitive, and environmental interactions. Finally, we summarized the shortcomings of BCI use in the field of stroke neurorehabilitation and the prospects for BCI technology development for rehabilitation.]

Post-stroke Health

Apathy after stroke: Diagnosis, mechanisms, consequences, and treatment
Tay J., Markus H.S., and Morris R.G.
International Journal of Stroke, vol. 16(5) pp. 510-518
Jul 2021
[Apathy is a reduction in goal-directed activity in the cognitive, behavioral, emotional, or social domains of a patient's life and occurs in one out of three patients after stroke. Despite this, apathy is clinically under-recognized and poorly understood. This overview provides a contemporary introduction to apathy in stroke for researchers and practitioners, covering topics including diagnosis, neurobiological mechanisms, associated consequences, and potential treatments for apathy. Apathy is often misdiagnosed as other post-stroke conditions such as depression. Accurate differential diagnosis of apathy, which manifests as reductions in initiative, and depression, which manifests as negative emotionality, is important as it informs prognosis. Research on the neurobiology of apathy suggests that there are few consistent associations between stroke lesion location and the development of apathy. These may be resolved by adopting a network neuroscience approach, which models apathy as a pathology arising from structural or functional damage to brain networks underlying motivated behavior. Importantly, networks can be affected by physiological changes related to stroke, including the acute infarct but also diaschisis and neurodegeneration. Aside from neurobiological changes, apathy is also associated with other negative outcome measures such as functional disability, cognitive impairment, and emotional distress, suggesting that apathy is indicative of a worse prognosis following stroke. Unfortunately, high-quality trials aimed at treating apathy are scarce. Antidepressants may have limited effects on apathy. Acetylcholine and dopamine pharmacotherapy, behavioral interventions, and transcranial magnetic stimulation may be more promising avenues for treatment.]

Rehabilitation

A prospective study to establish the minimal clinically important difference of the Mini-BESTest in individuals with stroke.
Beauchamp M.K., Niebuhr R., Roche P., Kirkwood R., Sibley K.M.
Clinical Rehabilitation, vol. 35(8); pp. 1207-1215
August 2021
Objective: To determine the minimal clinically important difference of the Mini-BESTest in individuals' post-stroke. Design: Prospective cohort study. **Setting**: Outpatient stroke rehabilitation. **Subjects**: Fifty outpatients with stroke with a mean (SD) age of 60.8 (9.4). **Intervention**: Outpatients with stroke were assessed with the Mini-BESTest before and after a course of conventional rehabilitation. Rehabilitation sessions occurred one to two times/week for one hour and treatment duration was 1.3–42 weeks (mean (SD) = 17.4(10.6)). **Main measures**: We used a combination of anchor- and distribution-based approaches including a global rating of change in balance scale completed by physiotherapists and patients, the minimal detectable change with 95% confidence, and the optimal cut-point from receiver operating characteristic curves. **Results**: The average (SD) Mini-BESTest score at admission was 18.2 (6.5) and 22.4 (5.2) at discharge (effect size: 0.7) (P = 0.001). Mean change scores on the Mini-BESTest for patient and physiotherapist ratings of small change were 4.2 and 4.3 points, and 4.7 and 5.3 points for substantial change, respectively. The minimal detectable change with 95% confidence for the Mini-BESTest was 3.2 points. The minimally clinical importance difference was determined to be 4 points for detecting small changes and 5 points for detecting substantial changes. **Conclusions**: A change of 4–5 points on the Mini-BEST is required to be perceptible to clinicians and patients, and beyond measurement error. These values can be used to interpret changes in balance in stroke rehabilitation research and practice.]

Critically appraised paper: Additional rehabilitation following botulinum toxin-A does not improve goal attainment and upper limb activity in chronic stroke survivors [synopsis].
Spittle A.J.
Journal of Physiotherapy, vol. 67(3)
July 2021
[Summary of: Lannin N.A., Ada L., English C., Ratcliffe J., Fauz S.G., Palit M., et al on behalf of the InTENSE Trial Group (2020). 'Effect of additional rehabilitation after botulinum toxin-A on upper limb activity in chronic stroke: The InTENSE Trial'. *Stroke,* 51 pp. 556–562]

Interventions for reducing sedentary behaviour in people with stroke

Saunders D.H., Mead G.E., Fitzsimons C., Kelly P., van Wijck F., Verschuren O., Backx K., and English C.

Cochrane Database of Systematic Reviews

June 2021

[**Objectives**: To determine whether interventions designed to reduce sedentary behaviour after stroke, or interventions with the potential to do so, can reduce the risk of death or secondary vascular events, modify cardiovascular risk, and reduce sedentary behaviour. **Search methods**: The authors searched the Cochrane Stroke Trials Register, CENTRAL, MEDLINE, Embase, CINAHL, PsycINFO, Conference Proceedings Citation Index, and PEDro. We also searched registers of ongoing trials, screened reference lists, and contacted experts in the field. **Selection criteria:** Randomised trials comparing interventions to reduce sedentary time with usual care, no intervention, or waiting-list control, attention control, sham intervention or adjunct intervention. The authors also included interventions intended to fragment or interrupt periods of sedentary behaviour. **Main results**: 10 studies with 753 people with stroke were included. Five studies used physical activity interventions, four studies used a multicomponent lifestyle intervention, and one study used an intervention to reduce and interrupt sedentary behaviour. In all studies, the risk of bias was high or unclear in two or more domains. Nine studies had high risk of bias in at least one domain. The interventions did not increase or reduce deaths (risk difference (RD) 0.00, 95% confidence interval (CI) -0.02 to 0.03; 10 studies, 753 participants; low-certainty evidence), the incidence of recurrent cardiovascular or cerebrovascular events (RD -0.01, 95% CI -0.04 to 0.01; 10 studies, 753 participants; low-certainty evidence), the incidence of falls (and injuries) (RD 0.00, 95% CI -0.02 to 0.02; 10 studies, 753 participants; low-certainty evidence), or incidence of other adverse events (moderate-certainty evidence). Interventions did not increase or reduce the amount of sedentary behaviour time (mean difference (MD) +0.13 hours/day, 95% CI -0.42 to 0.68; 7 studies, 300 participants; very low-certainty evidence). There were too few data to examine effects on patterns of sedentary behaviour. The effect of interventions on cardiometabolic risk factors allowed very limited meta-analysis. **Author's conclusions**: Sedentary behaviour research in stroke seems important, yet the evidence is currently incomplete, and we found no evidence for beneficial effects. Current World Health Organization (WHO) guidelines recommend reducing the amount of sedentary time in people with disabilities, in general. The evidence is currently not strong enough to guide practice on how best to reduce sedentariness specifically in people with stroke. More high-quality randomised trials are needed, particularly involving participants with mobility limitations. Trials should include longer-term interventions specifically targeted at reducing time spent sedentary, risk factor outcomes, objective measures of sedentary behaviour (and physical activity), and long-term follow-up.]

Non-pharmacological interventions for spatial neglect or inattention following stroke and other non-progressive brain injury

Longley V., Hazelton C., Heal C., Pollock A., Woodward-Nutt K., Mitchell C., Pobric G., Vail A., Bowen A.

Cochrane Database of Systematic Reviews

July 2021

Objectives: The main objective was to determine the effects of non-pharmacological interventions for people with spatial neglect after stroke and other adult-acquired non-progressive brain injury. **Search methods**: The authors searched the Cochrane Stroke Group Trials Register (last searched October 2020), the Cochrane Central Register of Controlled Trials (CENTRAL; last searched October 2020), MEDLINE (1966 to October 2020), Embase (1980 to October 2020), the Cumulative Index to Nursing and Allied Health Literature (CINAHL; 1983 to October 2020), and PsycINFO (1974 to October 2020). Ongoing trials registers and screened reference lists were also searched. The authors included randomised controlled trials (RCTs) of any non-pharmacological intervention specifically aimed at spatial neglect. Studies of general rehabilitation and studies with mixed participant groups were excluded, unless separate neglect data were available. **Main Results**: 65 RCTs with 1,951 participants were included, all of which included people with spatial neglect following stroke. Most studies measured outcomes using standardised neglect assessments. Fifty-one studies measured effects on ADL immediately after completion of the intervention period; only 16 reported persisting effects on ADL (our primary outcome). One study (30 participants) reported discharge destination, and one (24 participants) reported depression. No studies reported falls, balance, or quality of life. Only two studies were judged to be entirely at low risk of bias, and all were small, with fewer than 50 participants per group. The authors found no definitive (phase 3) clinical trials. None of the studies reported any patient or public involvement. **Authors' conclusions**: The effectiveness of non-pharmacological interventions for spatial neglect in improving functional ability in ADL and increasing independence remains unproven. Many strategies have been proposed to aid rehabilitation of spatial neglect, but none has yet been sufficiently

researched through high-quality fully powered randomised trials to establish potential or adverse effects. As a consequence, no rehabilitation approach can be supported or refuted based on current evidence from RCTs. As recommended by a number of national clinical guidelines, clinicians should continue to provide rehabilitation for neglect that enables people to meet their rehabilitation goals. Clinicians and stroke survivors should have the opportunity, and are strongly encouraged, to participate in research. Future studies need to have appropriate high-quality methodological design, delivery, and reporting to enable appraisal and interpretation of results. Future studies also must evaluate outcomes of importance to patients, such as persisting functional ability in ADL. One way to improve the quality of research is to involve people with experience with the condition in designing and running trials.]

SENSory re-learning of the UPPer limb (SENSUPP) after stroke: development and description of a novel intervention using the TIDieR checklist.
Carlsson H., Rosén B., Björkman A., Pessah-Rasmussen H., and Brogårdh C.
Trials; Jul 2021; vol. 22 (no. 1); p. 430
July 2021
[Background: Sensorimotor impairments of upper limb (UL) are common after stroke, leading to difficulty to use the UL in daily life. Even though many have sensory impairments in the UL, specific sensory training is often lacking in stroke rehabilitation. Thus, the aim of this paper is to provide a detailed description of the novel intervention "SENSory re-learning of the UPPer limb after stroke (SENSUPP)" that we have developed to improve functioning in the UL in persons with mild to moderate impairments after stroke. **Methods**: The SENSUPP protocol was designed using information from literature reviews, clinical experience and through consultation of experts in the field. The protocol integrates learning principles based on current neurobiological knowledge and includes repetitive intensive practice, difficulty graded exercises, attentive exploration of a stimulus with focus on the sensory component, and task-specific training in meaningful activities that includes feedback. For reporting the SENSUPP protocol, the Template for Intervention Description and Replication (TIDieR) checklist was used. **Results**: The essential features of the SENSUPP intervention comprise four components: applying learning principles based on current neurobiological knowledge, sensory re-learning (exercises for touch discrimination, proprioception and tactile object recognition), task-specific training in meaningful activities, and home-training. The training is performed twice a week, in 2.5-h sessions for 5 weeks. **Conclusion**: Since there is close interaction between the sensory and motor systems, the SENSUPP intervention may be a promising method to improve UL functioning after stroke. The TIDieR checklist has been very useful for reporting the procedure and development of the training.]

Serious games for upper limb rehabilitation after stroke: a meta-analysis.
Doumas I., Everard G., Dehem S., Lejeune T.
Journal of NeuroEngineering & Rehabilitation (JNER)
Jun 2021; vol. 18(1); pp. 1-16
[**Background**: Approximately two thirds of stroke survivors maintain upper limb (UL) impairments and few among them attain complete UL recovery 6 months after stroke. Technological progress and gamification of interventions aim for better outcomes and constitute opportunities in self- and tele-rehabilitation. **Objectives**: Our objective was to assess the efficacy of serious games, implemented on diverse technological systems, targeting UL recovery after stroke. In addition, we investigated whether adherence to neurorehabilitation principles influenced efficacy of games specifically designed for rehabilitation, regardless of the device used. **Method**: This systematic review was conducted according to PRISMA guidelines (PROSPERO registration number: 156589). Two independent reviewers searched PubMed, EMBASE, SCOPUS and Cochrane Central Register of Controlled Trials for eligible randomized controlled trials (PEDro score ≥ 5). Meta-analysis, using a random effects model, was performed to compare effects of interventions using serious games, to conventional treatment, for UL rehabilitation in adult stroke patients. In addition, we conducted subgroup analysis, according to adherence of included studies to a consolidated set of 11 neurorehabilitation principles. **Results**: Meta-analysis of 42 trials, including 1,760 participants, showed better improvements in favor of interventions using serious games when compared to conventional therapies, regarding UL function (SMD = 0.47; 95% CI = 0.24 to 0.70; P < 0.0001), activity (SMD = 0.25; 95% CI = 0.05 to 0.46; P = 0.02) and participation (SMD = 0.66; 95% CI = 0.29 to 1.03; P = 0.0005). Additionally, long term effect retention was observed for UL function (SMD = 0.42; 95% CI = 0.05 to 0.79; P = 0.03). Interventions using serious games that complied with at least 8 neurorehabilitation principles showed better overall effects. Although heterogeneity levels remained moderate, results were little affected by changes in methods or outliers indicating robustness. **Conclusion**:

This meta-analysis showed that rehabilitation through serious games, targeting UL recovery after stroke, leads to better improvements, compared to conventional treatment, in three ICF-WHO components. Irrespective of the technological device used, higher adherence to a consolidated set of neurorehabilitation principles enhances efficacy of serious games. Future development of stroke-specific rehabilitation interventions should further take into consideration the consolidated set of neurorehabilitation principles.]

The ReWork-Stroke rehabilitation programme described by use of the TIDieR checklist.
Johansson U., Hellman T., Öst Nillson A., and Eriksson G.
Scandinavian Journal of Occupational Therapy, vol. 28(5) pp. 375-383
Jul 2021
[About half of those that have had stroke in working age return to work (RTW). Few rehabilitation programmes exist focussing RTW after stroke. To produce a clear replicable description of the ReWork-Stroke rehabilitation programme targeting RTW for people of working age who have had stroke. The Template for Intervention Description and Replication 12 item checklist was used to describe the ReWork-Stroke programme developed 2013–2014. This paper presents the development, rationale and processes in the programme to enable replication and provide evidence for implementation. Occupational therapists (OTs) skilled in stroke rehabilitation contribute knowledge about consequences of stroke and coordinate stakeholders involved. The ReWork-Stroke is person-centred, includes individual plans and generic components, consists of a preparation and a work trial phase. During the preparation phase, resources and hindrances for RTW are mapped and a plan for work trial is elaborated. During the work trial phase, the intervention is located at the workplace. The OT conducts recurrent follow-ups and collaborates with employers/co-workers. A person-centred programme has advantages in its flexibility to meet different needs between people and by this thorough description of ReWork-Stroke, others can replicate the programme and its fidelity and evidence can be strengthened.]

Risk of Stroke

Global, regional, and national burdens of ischemic heart disease and stroke attributable to exposure to long working hours for 194 countries, 2000-2016: A systematic analysis from the WHO/ILO joint estimates of the work-related burden of disease and injury
Pega F., Náfrádi B., Momen N.C., Ujita Y., Streicher K.N., Prüss-Üstün A.M., Descatha A., Driscoll T. et al
Environment International, vol. 154
September 2021
[**Background**: World Health Organization (WHO) and International Labour Organization (ILO) systematic reviews reported sufficient evidence for higher risks of ischemic heart disease and stroke amongst people working long hours (≥55 hours/week), compared with people working standard hours (35-40 hours/week). This article presents WHO/ILO Joint Estimates of global, regional, and national exposure to long working hours, for 194 countries, and the attributable burdens of ischemic heart disease and stroke, for 183 countries, by sex and age, for 2000, 2010, and 2016. **Methods and findings**: We calculated population-attributable fractions from estimates of the population exposed to long working hours and relative risks of exposure on the diseases from the systematic reviews. The exposed population was modelled using data from 2,324 cross-sectional surveys and 1,742 quarterly survey datasets. Attributable disease burdens were estimated by applying the population-attributable fractions to WHO's Global Health Estimates of total disease burdens. **Results**: In 2016, 488 million people (95% uncertainty range: 472-503 million), or 8.9% (8.6-9.1) of the global population, were exposed to working long hours (≥55 hours/week). An estimated 745,194 deaths (705,786-784,601) and 23.3 million disability-adjusted life years (22.2-24.4) from ischemic heart disease and stroke combined were attributable to this exposure. The population-attributable fractions for deaths were 3.7% (3.4-4.0) for ischemic heart disease and 6.9% for stroke (6.4-7.5); for disability-adjusted life years they were 5.3% (4.9-5.6) for ischemic heart disease and 9.3% (8.7-9.9) for stroke. **Conclusions**: WHO and ILO estimate exposure to long working hours (≥55 hours/week) is common and causes large attributable burdens of ischemic heart disease and stroke. Protecting and promoting occupational and workers' safety and health requires interventions to reduce hazardous long working hours.]

The effect of occupational exposure to noise on ischaemic heart disease, stroke and hypertension: A systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-Related Burden of Disease and Injury.

Teixeira L.R., Pega F., Dzhambov A.M., Bortkiewicz A., da Silva, D.T.C., de Andrade C.A.F, and Gadzicka, E.

Environment International, vol. 154

September 2021

Background: The World Health Organization (WHO) and the International Labour Organization (ILO) are developing joint estimates of the work-related burden of disease and injury (WHO/ILO Joint Estimates), with contributions from a large number of individual experts. Evidence from mechanistic data suggests that occupational exposure to noise may cause cardiovascular disease (CVD). In this paper, we present a systematic review and meta-analysis of parameters for estimating the number of deaths and disability-adjusted life years from CVD that are attributable to occupational exposure to noise, for the development of the WHO/ILO Joint Estimates. **Objectives**: We aimed to systematically review and meta-analyse estimates of the effect of any (high) occupational exposure to noise (≥85 dBA), compared with no (low) occupational exposure to noise (<85 dBA), on the prevalence, incidence and mortality of ischaemic heart disease (IHD), stroke, and hypertension. **Data sources**: A protocol was developed and published, applying the Navigation Guide as an organizing systematic review framework where feasible. We searched electronic academic databases for potentially relevant records from published and unpublished studies up to 1 April 2019, including International Trials Register, Ovid MEDLINE, PubMed, Embase, Lilacs, Scopus, Web of Science, and CISDOC. The MEDLINE and Pubmed searches were updated on 31 January 2020. We also searched grey literature databases, Internet search engines and organizational websites; hand-searched reference lists of previous systematic reviews and included study records; and consulted additional experts. **Study eligibility and criteria**: We included working-age (≥15 years) workers in the formal and informal economy in any WHO and/or ILO Member State but excluded children (<15 years) and unpaid domestic workers. We included randomized controlled trials, cohort studies, case-control studies and other non-randomized intervention studies with an estimate of the effect of any occupational exposure to noise on CVD prevalence, incidence or mortality, compared with the theoretical minimum risk exposure level (<85 dBA). **Study appraisal and synthesis methods**: At least two review authors independently screened titles and abstracts against the eligibility criteria at a first stage and full texts of potentially eligible records at a second stage, followed by extraction of data from qualifying studies. We prioritized evidence from cohort studies and combined relative risk estimates using random-effect meta-analysis. To assess the robustness of findings, we conducted sensitivity analyses (leave-one-out meta-analysis and used as alternative fixed effects and inverse-variance heterogeneity estimators). At least two review authors assessed the risk of bias, quality of evidence and strength of evidence, using Navigation Guide tools and approaches adapted to this project. **Results**: Seventeen studies (11 cohort studies, six case-control studies) met the inclusion criteria, comprising a total of 534,688 participants (39,947 or 7.47% females) in 11 countries in three WHO regions (the Americas, Europe, and the Western Pacific). The exposure was generally assessed with dosimetry, sound level meter and/or official or company records. The outcome was most commonly assessed using health records. We are very uncertain (low quality of evidence) about the effect of occupational exposure to noise (≥85 dBA), compared with no occupational exposure to noise (<85 dBA), on: having IHD (0 studies); acquiring IHD (relative risk (RR) 1.29, 95% confidence interval (95% CI) 1.15 to 1.43, two studies, 11,758 participants, I2 0%); dying from IHD (RR 1.03, 95% CI 0.93-1.14, four studies, 198,926 participants, I2 26%); having stroke (0 studies); acquiring stroke (RR 1.11, 95% CI 0.82-1.65, two studies, 170,000 participants, I2 0%); dying from stroke (RR 1.02, 95% CI 0.93-1.12, three studies, 195,539 participants, I2 0%); having hypertension (0 studies); acquiring hypertension (RR 1.07, 95% CI 0.90-1.28, three studies, four estimates, 147,820 participants, I2 52%); and dying from hypertension (0 studies). Data for subgroup analyses were missing. Sensitivity analyses supported the main analyses. **Conclusions**: For acquiring IHD, we judged the existing body of evidence from human data to provide "limited evidence of harmfulness"; a positive relationship is observed between exposure and outcome where chance, bias, and confounding cannot be ruled out with reasonable confidence. For all other included outcomes, the bodies of evidence were judged as "inadequate evidence of harmfulness". Producing estimates for the burden of CVD attributable to occupational exposure to noise appears to not be evidence-based at this time.

The impact of parental risk factors on the risk of stroke in type 1 diabetes.
Ylinen A., Hägg-Holmberg S., Eriksson M.I., Forsblom C., Harjutsalo V., Putaala J., Groop P-H, Thorn L.M. et al
Acta Diabetologica, vol. 58(7) pp. 911-917
Jul 2021
[**Background**: Individuals with type 1 diabetes have a markedly increased risk of stroke. In the general population, genetic predisposition has been linked to increased risk of stroke, but this has not been assessed in type 1 diabetes. Our aim was, therefore, to study how parental risk factors affect the risk of stroke in individuals with type 1 diabetes. **Methods**: This study represents an observational follow-up of 4,011 individuals from the Finnish Diabetic Nephropathy Study, mean age at baseline 37.6 ± 11.9 years. All strokes during follow-up were verified from medical records or death certificates. The strokes were classified as either ischemic or hemorrhagic. All individuals filled out questionnaires concerning their parents' medical history of hypertension, diabetes, stroke, and/or myocardial infarction. **Results**: During a median follow-up of 12.4 (10.9-14.2) years, 188 individuals (4.6%) were diagnosed with their first ever stroke; 134 were ischemic and 54 hemorrhagic. In Cox regression analysis, a history of maternal stroke increased the risk of hemorrhagic stroke, hazard ratio 2.86 (95% confidence interval 1.27-6.44, p = 0.011) after adjustment for sex, age, BMI, retinal photocoagulation, and diabetic kidney disease. There was, however, no association between maternal stroke and ischemic stroke. No other associations between parental risk factors and ischemic or hemorrhagic stroke were observed. **Conclusion**: A history of maternal stroke increases the risk of hemorrhagic stroke in individuals with type 1 diabetes. Other parental risk factors seem to have limited impact on the risk of stroke.]

The relationship between COVID-19's severity and ischemic stroke: a systematic review and meta-analysis.
Lu Y., Zhao J-J., Ye M-F., Li H-M., Yao F-R., Kong Y., and Xu Z.
Neurological Sciences, vol. 42(7) pp. 2645-2651
Jul 2021
[**Objective**: We aim to determine the risk of acute ischemic stroke in patients with severe and non-severe coronavirus disease 2019 (COVID-19). **Methods**: A literature search was conducted in the PubMed, Embase, Web of Science, and Cochrane Library databases until October 28, 2020. Studies covering COVID-19's severity classification data and COVID-19 patients with acute ischemic stroke were included. Two independent evaluators extracted data, and the random effects model was used to calculate the risk ratios (RR) and 95% confidence interval (95% CI) of acute ischemic stroke associated with COVID-19's severity. **Results**: A total of 8 studies were included, involving 5,266 patients. Among all COVID-19 patients, the total incidence of ischemic stroke was 1.76% (95% CI: 0.82-3.01). Severe patients have an increased risk of acute ischemic stroke compared with non-severe patients (RR = 3.53, 95% CI: 2.06-6.07, P < 0.0001; I2 = 12%). This association was also observed when COVID-19's severity was defined by clinical parameters (RR 2.91, 95% CI: 1.17-7.26, P = 0.02; I2 = 29%) and the need for intensive care (RR 4.47, 95% CI: 2.40-8.31, P < 0.0001; I2 = 0%). **Conclusions**: This meta-analysis shows that the severe course of COVID-19 is associated with an increased risk of acute ischemic stroke.]

Stroke Detection

Automatic Acute Stroke Symptom Detection and Emergency Medical Systems Alerting by Mobile Health Technologies: A Review.
Bat-E. B-O, and Saver J.L.
Journal of Stroke and Cerebrovascular Diseases, vol. 30(7)
July 2021
[**Objectives**: To survey recent advances in acute stroke symptom automatic detection and Emergency Medical Systems (EMS) alerting by mobile health technologies. **Materials and methods**: Narrative review. **Results**: Delayed activation of EMS for stroke symptoms by patients and witnesses deprives patients of rapid access to brain-saving therapies and occurs due to public unawareness of stroke features, cognitive and motor deficits produced by the stroke itself, and sleep onset. A promising emerging approach to overcoming the inherent biologic constraints of patient capacity to self-detect and respond to stroke symptoms is continuous monitoring by mobile health

technologies with wireless sensors and artificial intelligence recognition systems. This review surveys 11 sensing technologies - accelerometers, gyroscopes, magnetometers, pressure sensors, touch screen and keyboard input detectors, artificial vision, and artificial hearing; and 10 consumer device form factors in which they are increasingly implemented: smartphones, smart speakers, smart watches and fitness bands, smart speakers/voice assistants, home health robots, smart clothing, smart beds, closed circuit television, smart rings, and desktop/laptop/tablet computers. **Conclusions**: The increase in computing power, wearable sensors, and mobile connectivity have ushered in an array of mobile health technologies that can transform stroke detection and EMS activation. By continuously monitoring a diverse range of biometric parameters, commercially available devices provide the technologic capability to detect cardinal language, motor, gait, and sensory signs of stroke onset. Intensified translational research to convert the promise of these technologies to validated, accurate real-world deployments are an important next priority for stroke investigation.]

Stroke Prevention

Pre-stroke statin therapy improves in-hospital prognosis following acute ischemic stroke associated with well-controlled nonvalvular atrial fibrillation

Wankowicz P., Szylinska A., Turon-Skrzypinska A., Rotter I., Staszewski J., Debiec A., and Nowakowska-Kotas M.
Journal of Clinical Medicine, vol. 10(14)
Jul 2021
[Many studies have confirmed the positive effect of statins in the secondary prevention of ischemic stroke. Although several studies have concluded that statins may also be beneficial in patients with atrial fibrillation-related stroke, the results of those studies are inconclusive. Therefore, the aim of this study was to analyze the effect of pre-stroke statin therapy on atrial fibrillation-related stroke among patients with a well-controlled atrial fibrillation. This retrospective multicenter analysis comprised 2,309 patients with acute stroke, with a total of 533 patients meeting the inclusion criteria. The results showed a significantly lower neurological deficit on the National Institutes of Health Stroke Scale at hospital admission and discharge in the group of atrial fibrillation-related stroke patients who took statins before hospitalization compared with those who did not ($p < 0.001$). In addition, in-hospital mortality was significantly higher in the atrial fibrillation-related stroke patients not taking statins before hospitalization than in those who did ($p < 0.001$). Based on the results of our previous research and this current study, we postulate that the addition of a statin to the oral anticoagulants may be helpful in the primary prevention of atrial fibrillation-related stroke.]

An updated meta-analysis of rcts of colchicine for stroke prevention in patients with coronary artery disease

Katsanos A.H., Palaiodimou L., Tsivgoulis G., Price C., Themistocleous M., Lemmens R., Michopoulos I. et al
Journal of Clinical Medicine, vol. 10 (14)
Jul 2021
[Emerging evidence from randomized controlled clinical trials (RCTs) suggests that colchicine has cardiovascular benefits for patients with coronary disease, including benefits for stroke prevention. We performed an updated systematic review and meta-analysis of all RCTs reporting on stroke outcomes during the follow-up of patients with a history of cardiovascular disease randomized to colchicine treatment or control (placebo or usual care). We identified 6 RCTs including a total of 11,870 patients (mean age 63 years, 83% males) with a mean follow-up of 2 years. Colchicine treatment was associated with a lower risk of stroke during follow-up, compared to that of placebo or usual care (risk ratio = 0.49, 95% confidence interval: 0.31-0.80; $p = 0.004$), without heterogeneity across the included studies ($I2 = 0\%$, p for Cochran's $Q = 0.52$). In the subgroup analysis, no heterogeneity ($p = 0.77$) was identified in the effect of colchicine on stroke prevention between patients with recent acute (RR = 0.55, 95% CI: 0.15-2.05) or chronic stable (RR = 0.43, 95% CI: 0.21-0.89) coronary artery syndromes. In conclusion, we found that colchicine treatment decreases the stroke risk in patients with a history of atherosclerotic cardiovascular disease.]

Thrombectomy / Endovascular Treatment

Mechanical thrombectomy for stroke patients anticoagulated with direct oral anticoagulants versus warfarin
Koge J., Toyoda K., Tanaka K., Yamagami H., Yoshimoto T., Uchida K., Yoshimura S., Morimoto T., and Sakai N.
Journal of the Neurological Sciences, vol. 427
Aug 2021
[**Background**: Outcomes after mechanical thrombectomy (MT) for large vessel occlusion (LVO) were compared between stroke patients anticoagulated with direct oral anticoagulants (DOACs) and those anticoagulated with warfarin. **Material(s) and Method(s)**: From data for 2,399 LVO stroke patients in a prospective, multicenter registry, patients with prior oral anticoagulation who underwent MT were analyzed. Angiographic outcomes included successful recanalization (modified Thrombolysis in Cerebral Infarction 2b/3). Clinical outcomes included modified Rankin Scale (mRS) score 0-2 at 3 months and symptomatic intracranial hemorrhage. **Result(s)**: A total of 235 patients (95 women, median age 78 [interquartile range, 72-84] years) were included. Prescribed anticoagulants were DOACs in 61 patients and warfarin in 174 patients. Of patients on warfarin, 135 (77.6%) had a non-therapeutic therapy (international normalized ration [INR] <=1.7). Patients on therapeutic warfarin (INR >1.7) had younger age and shorter onset to hospital arrival time than those on non-therapeutic warfarin and DOACs. The achievement of successful recanalization in warfarin groups was similar to the DOACs group, with an adjusted odds ratio (aOR) for therapeutic warfarin versus DOACs of 1.14 (95% confidence interval [CI], 0.27-4.89) and non-therapeutic warfarin versus DOACs of 0.92 (95% CI, 0.39-2.20), respectively. The frequency of mRS score 0-2 at 3 months in the therapeutic (aOR, 2.63; 95% CI, 0.86-7.98) and non-therapeutic warfarin (aOR, 1.77; 95% CI, 0.76-4.09) groups were similar to those in the DOACs group. There was no significant difference in symptomatic intracranial hemorrhage between groups. **Conclusion(s)**: Angiographic and clinical outcomes after MT were similar between patients anticoagulated with DOACs and warfarin.]

True first-pass effect in basilar artery occlusions: First-pass complete reperfusion improves clinical outcome in stroke thrombectomy patients.
Abdullayev N., Maus V., Behme D., Barnikol U.B., Kutschke S., Stockero A., Goertz L., Celik E., Zaeske C. et al
Journal of Clinical Neuroscience, vol. 89 pp. 33-38
July 2021
[**Background**: Complete reperfusion (mTICI 3) in anterior circulation ischemic stroke patients after a single mechanical thrombectomy (MT) pass has been identified as a predictor of favorable outcome (modified Rankin Score 0-2) and defined as true first-pass effect recently. This effect has not yet been demonstrated in posterior circulation ischemic stroke. We hypothesized a true first-pass effect for the subgroup of acute basilar artery occlusions (BAO). **Methods**: Consecutive patients with acute thromboembolic occlusions in the posterior circulation, treated between 2010 and 2017, were screened and all BAO patients with complete angiographic reperfusion and known symptom onset included for unmatched and matched analysis after adjustment for multiple confounding factors (demographics, time intervals, stroke severity, posterior circulation Alberta Stroke Program early computed tomography Score and comorbidity. The primary objective was outcome at 90 days between matched cohorts of single pass vs. multi pass complete reperfusion patients. **Results**: 90 MTs in BAO were analyzed, yielding 56 patients with known symptom onset, in whom we achieved complete reperfusion (mTICI 3), depending on whether complete reperfusion was achieved after a single pass (n = 28) or multiple passes (n = 28). Multivariable analysis of 56 non-matched patients revealed a significant association between first-pass complete reperfusion and favorable outcome ($p < 0.01$). In matched cohorts (n = 7 vs. n = 7), favorable outcome was only seen if complete reperfusion was achieved after a single pass (86% vs. 0%). **Conclusion**: Single pass complete reperfusion in acute basilar artery occlusion is an independent predictor of favorable outcome. Achieving complete reperfusion after multiple passes might impair favorable patient recovery.]

Airedale NHS Library
www.educationairedale.co.uk/library
✉ anhsft.library@nhs.net
☎ 01535 294412
Airedale General Hospital – Location B11

This bulletin is available online from the library website and contains links to the listed articles.