Airedale
NHS Foundation Trust

Library Current Awareness Bulletin
Stroke – October 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 let us know. 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

To support safe provision of mechanical thrombectomy services for patients with acute ischaemic stroke: 2021 consensus guidance from BASP, BSNR, ICSWP, NACCS, and UKNG
Clinical Radiology
Article in Press, 05 August 2021

Complications

Stroke-associated pneumonia: A bibliometric analysis of worldwide trends from 2003 to 2020.
Chen Y., Yang H., Wei H., Chen Y., and Lan M.
Medicine, vol. 100(38)
September 2021
[Stroke-associated pneumonia (SAP) is a spectrum of pulmonary infections in patients within 7 days of stroke. Which is one of the most common complications after stroke and is significantly associated with a poor prognosis of stroke. To the best of our knowledge, a bibliometric method was not previously used to analyze the topic of SAP; we aim to describe the situation and evolution of SAP from 2003 to 2020, and to discuss the research hotspots and frontiers. A

total of 151 articles were retrieved from the Scopus database. Bibliometric analysis was used to explore the dynamic trends of articles and the top subject areas, journals, institutes, citations, and co-keywords. VOS viewer software (version 1.6.15) was used to graphically map the hot topics of SAP based on the co-keywords. A total of 151 articles were identified. Articles have increased over the recent years and faster in the last 2 years (55 articles, 36.4%), the majority of subject areas are medicine (124 articles, 82.1%) and neuroscience (38 articles, 25.2%). The "Journal Of Stroke And Cerebrovascular Diseases" with 15 articles has been scored as the first rank followed by "Plos One." Regarding the geographical distribution of articles, China is the most productive country with 50 articles (33.1%), others are more prominent in Europe, and most institutes are universities. Citations have increased over time, the main country of the top five highly cited published articles are Germany and before 2008. The co-keywords are mainly divided into four aspects: risk factors, predictive scores, preventions, and outcomes. This study could provide practical sources for researchers to find the top subject areas, journals, institutes, citations, and co-keywords. Moreover, the study could pave the way for researchers to be engaged in studies potentially lead to more articles in this field.]

COVID-19: Impact on Stroke Services

Changes in Stroke Hospital Care During the COVID-19 Pandemic: A Systematic Review and Meta-Analysis
Katsanos A.H., Palaiodimou L., Zand R., Yaghi S., Kamel H., Navi B.B., Turc G., Benetou V., Sharma V.K. et al
Stroke (AHA), Online First
August 2021
[**Background and Purpose**: We systematically evaluated the impact of the coronavirus 2019 (COVID-19) pandemic on stroke care across the world. **Methods**: Observational studies comparing characteristics, acute treatment delivery, or hospitalization outcomes between patients with stroke admitted during the COVID-19 pandemic and those admitted before the pandemic were identified by Medline, Scopus, and Embase databases search. Random-effects meta-analyses were conducted for all outcomes. **Results**: We identified 46 studies including 129 491 patients. Patients admitted with stroke during the COVID-19 pandemic were found to be younger (mean difference, −1.19 [95% CI, −2.05 to −0.32]; I2=70%) and more frequently male (odds ratio, 1.11 [95% CI, 1.01–1.22]; I2=54%) compared with patients admitted with stroke in the prepandemic era. Patients admitted with stroke during the COVID-19 pandemic, also, had higher baseline National Institutes of Health Stroke Scale scores (mean difference, 0.55 [95% CI, 0.12–0.98]; I2=90%), higher probability for large vessel occlusion presence (odds ratio, 1.63 [95% CI, 1.07–2.48]; I2=49%) and higher risk for in-hospital mortality (odds ratio, 1.26 [95% CI, 1.05–1.52]; I2=55%). Patients with acute ischemic stroke admitted during the COVID-19 pandemic had higher probability of receiving endovascular thrombectomy treatment (odds ratio, 1.24 [95% CI, 1.05–1.47]; I2=40%). No difference in the rates of intravenous thrombolysis administration or difference in time metrics regarding onset to treatment time for intravenous thrombolysis and onset to groin puncture time for endovascular thrombectomy were detected. **Conclusions**: The present systematic review and meta-analysis indicates an increased prevalence of younger patients, more severe strokes attributed to large vessel occlusion, and higher endovascular treatment rates during the COVID-19 pandemic. Patients admitted with stroke during the COVID-19 pandemic had higher in-hospital mortality. These findings need to be interpreted with caution in view of discrepant reports and heterogeneity being present across studies.]

Delivering telemedicine consultations for patients with transient ischaemic attack during the COVID-19 pandemic in a comprehensive tertiary stroke centre in the United Kingdom
D'Anna L., Ellis N., Bentley P., Brown Z., Halse O., Jamil S., Jenkins H., Malik A., Kalladka D. Kwan J., Venter M. et al
European Journal of Neurology, vol. 28(10) pp. 3456-3460
October 2021
[**Background and purpose**: The global COVID-19 pandemic led many stroke centres worldwide to shift from in-person to telemedicine consultations to assess patients with transient ischaemic attacks (TIAs). We aimed to investigate the impact of telemedicine during the COVID-19 pandemic on the management and outcome of the patients with TIA. Methods: We retrospectively analysed data from a registry of consecutive TIA patients assessed at the Stroke Department, Imperial College Health Care Trust, London, during the national lockdown period (between March 23 2020 and 30 June 2020). As controls, we evaluated the clinical reports and stroke quality metrics of patients presenting to the TIA clinic in the same period of 2019. **Results**: Between 23 March 2020 and 30 June 2020, 136 patients were assessed using the telemedicine TIA clinic, compared to 180 patients evaluated with face-to-face consultation in the same period in 2019. Patients' characteristics were similar in both groups. At 3 months after the

TIA, there were no significant differences in the proportion of patients admitted to the hospital for recurrent TIA/stroke or any other cardiovascular cause from the 2020 period compared to the same period in 2019. **Conclusions**: Our analysis showed that during the pandemic, our telemedicine consultations of TIA patients were not associated with an increased 3-month rate of recurrent TIA/stroke or cardiovascular hospital admissions. More robust studies looking at this model of care will be needed to assess its long-term effects on patients and health care systems.]

Drug Therapy / Stroke Prophylaxis

Ultraearly thrombolysis by an anesthesiologist in a mobile stroke unit: A prospective, controlled intervention study
Larsen K., Jaeger H.S., Tveit L.H., Hov M.R., Thorsen K., Røislien J., Solyga V., Lund C.G., and Bache K.G.
European Journal of Neurology, vol. 28(8) pp. 2488-2496
August 2021
[**Background:** Acute stroke treatment in mobile stroke units (MSU) is feasible and reduces time-to-treatment, but the optimal staffing model is unknown. We wanted to explore if integrating thrombolysis of acute ischemic stroke (AIS) in an anesthesiologist-based emergency medical services (EMS) reduces time-to-treatment and is safe. **Methods:** A nonrandomized, prospective, controlled intervention study. Inclusion criteria: age ≥18 years, nonpregnant, stroke symptoms with onset ≤4 h. The MSU staffing is inspired by the Norwegian Helicopter Emergency Medical Services crew with an anesthesiologist, a paramedic-nurse and a paramedic. Controls were included by conventional ambulances in the same catchment area. Primary outcome was onset-to-treatment time. Secondary outcomes were alarm-to-treatment time, thrombolytic rate and functional outcome. Safety outcomes were symptomatic intracranial hemorrhage and mortality. **Results:** We included 440 patients. MSU median (IQR) onset-to-treatment time was 101 (71–155) minutes versus 118 (90–176) minutes in controls, p = 0.007. MSU median (IQR) alarm-to-treatment time was 53 (44–65) minutes versus 74 (63–95) minutes in controls, p < 0.001. Golden hour treatment was achieved in 15.2% of the MSU patients versus 3.7% in the controls, p = 0.005. The thrombolytic rate was higher in the MSU (81% vs 59%, p = 0.001). MSU patients were more often discharged home (adjusted OR [95% CI]: 2.36 [1.11–5.03]). There were no other significant differences in outcomes. **Conclusions:** Integrating thrombolysis of AIS in the anesthesiologist-based EMS reduces time-to-treatment without negatively affecting outcomes. An MSU based on the EMS enables prehospital assessment of acute stroke in addition to other medical and traumatic emergencies and may facilitate future implementation.]

Neuroscience & Neuroimaging

Intracranial aneurysm wall enhancement as an indicator of instability: a systematic review and meta-analysis
Molenberg R., Aalbers M.W., Appelman A.P.A., Uyttenboogaart M., and Van Dijik J.M.C
European Journal of Neurology, Early View
August 2021
[**Background and purpose**: Aneurysm wall enhancement (AWE) of intracranial aneurysms on magnetic resonance imaging has been described in previous studies as a surrogate marker of instability. With this study, an updated literature overview and summary risk estimates of the association between AWE and different specific outcomes (i.e., rupture, growth or symptomatic presentation) for both cross-sectional and longitudinal studies are provided. **Methods**: The PRISMA guideline was followed and a search was performed of PubMed and Embase to 1 January 2021 for studies that reported on AWE and aneurysm instability. In cross-sectional studies, AWE was compared between patients with stable and unstable aneurysms. In longitudinal studies, AWE of stable aneurysms was assessed at baseline after which patients were followed longitudinally. Risk ratios were calculated for longitudinal studies, prevalence ratios for cross-sectional studies and then the ratios were pooled in a random-effects meta-analysis. Also, the performance of AWE to differentiate between stable and unstable aneurysms was evaluated. **Results**: Twelve studies were included with a total of 1761 aneurysms. In cross-sectional studies, AWE was positively associated with rupture (prevalence ratio 11.47, 95% confidence interval [CI] 4.05–32.46) and growth or symptomatic presentation (prevalence ratio 4.62, 95% CI 2.85–7.49). Longitudinal studies demonstrated a positive association between AWE and growth or rupture (risk ratio 8.00, 95% CI 2.14–29.88). Assessment of the performance of AWE showed high sensitivities, mixed specificities, low positive predictive values and high negative

predictive values. **Conclusions**: Although AWE is positively associated with aneurysm instability, current evidence mostly supports the use of its absence as a surrogate marker of aneurysm stability.]

Post-stroke Health

'Somebody stuck me in a bag of sand': Lived experiences of the altered and uncomfortable body after stroke
Stott H., Cramp M., McClean S. and Turton A.
Clinical Rehabilitation, vol. 35(9) pp. 1348-1359
September 2021
[**Objective**: This study explored stroke survivors' experiences of altered body perception, whether these perceptions cause discomfort, and the need for clinical interventions to improve comfort. **Design**: A qualitative phenomenological study. **Setting**: Participants' homes. **Participants**: A purposive sample of 16 stroke survivors were recruited from community support groups. Participants (median: age 59; time post stroke >2years), were at least six-months post-stroke, experiencing motor or sensory impairments and able to communicate verbally. **Interventions**: Semi-structured, face-to-face interviews were analysed using an interpretive phenomenological approach and presented thematically. **Results**: Four themes or experiences were identified: Participants described (1) a body that did not exist; (2) a body hindered by strange sensations and distorted perceptions; (3) an uncontrollable body; and (4) a body isolated from social and clinical support. Discomfort was apparent in a physical and psychological sense and body experiences were difficult to comprehend and communicate to healthcare staff. Participants wished for interventions to improve their comfort but were doubtful that such treatments existed. **Conclusion**: Indications are that altered body perceptions cause multifaceted physical and psychosocial discomfort for stroke survivors. Discussions with patients about their personal perceptions and experiences of the body may facilitate better understanding and management to improve comfort after stroke.]

Rehabilitation

Clinical Evaluation of Different Treatment Strategies for Motor Recovery in Poststroke Rehabilitation during the First 90 Days
Koroleva E.S., Kazakov S.D., Tolmachev I.V., Loonen A.J.M., Ivanova S., and Alifirova V.M.
Journal of Clinical Medicine, vol. 10(16)
August 2021
[**Background**: Motor recovery after stroke is based on neuronal plasticity and the structural reorganization of the brain. Questions are debated about the proper moment to start rehabilitation in the acute period of stroke, the significance of rehabilitation interventions during the so-called "plastic window", and the advantages of modern and traditional programs. The aims of this study were to evaluate the role of different rehabilitation strategies and their combinations for motor recovery and the impact on functional disability by way of neurological and functional outcomes 3 months after ischemic stroke. **Methods**: We used three rehabilitation approaches: early rehabilitation from the first day of stroke (Phase I), traditional exercise programs (Phase II), and an author's new method of biofeedback rehabilitation using motion sensors and augmented reality (AR) rehabilitation (Phase III). Clinical and functional outcomes were measured on the 90th day after stroke. We developed algorithms for quantifying the quality of movements during the execution of tasks in the motor domains of the AR rehabilitation program. **Results**: Phase I of rehabilitation led to an improvement in functional independence, and the recovery of motor functions of the extremities with an absence of mortality and clinical deterioration. AR rehabilitation led to significant improvement both with respect to clinical and functional scores on scales and to variables reflecting the quality of movements. Patients who were actively treated during Phases II and III achieved the same final level of motor recovery and functional outcomes as that of participants who had only received AR rehabilitation during Phase III. Patients who underwent outpatient observation after Phase I showed a deficit of spontaneous motor recovery on the 90th day after stroke. **Conclusions**: Early rehabilitation was successful but was not enough; rehabilitation programs should be carried out throughout the entire "sensitive period" of poststroke plasticity. The newly developed AR biofeedback motion training is effective and safe as a separate rehabilitation method in the early recovery period of moderately severe, hemiparalytic, and ischemic stroke. These two rehabilitation approaches must be applied together or after each other, not instead of each other, as shown in clinical practice.]

Factors influencing implementation of aerobic exercise after stroke: a systematic review
Gaskins N., Bray E., Hill J.E., Doherty P.J., Harrison A., and Connell L.
Disability and Rehabilitation, vol. 43(17) pp. 2382-2396
August 2021
[**Objectives:** This systematic review aimed to explore the perspectives of healthcare, exercise, and fitness professionals working with people post-stroke regarding the factors affecting the implementation of aerobic exercise after stroke. **Data Sources:** OVID SP MEDLINE, OVID SP EMBASE, and CINAHL were searched from inception to December 2018 using a combination of search terms with synonyms of stroke, aerobic exercise and barriers/facilitators. **Review methods:** Studies focusing on the factors affecting implementation of aerobic exercise after stroke from staff perspectives were included with no restriction on the types of study design. For inclusivity, a broad definition of aerobic exercise was used. Review authors independently extracted data from included studies using domains from the Consolidated Framework for Implementation Research, then synthesised using a framework synthesis approach. Retrospective automated screening was conducted using Rayyan software. **Results:** Twenty studies were included. Four reported on implementation of aerobic exercise, sixteen on general exercise interventions, all post-stroke. Factors identified as influencing implementation of aerobic exercise after stroke included professionals' self-efficacy and knowledge about stroke, patients' needs, communication and collaboration within and between organisations and resources such as equipment, staff and training. **Conclusions:** Key factors influencing the implementation of aerobic exercise after stroke included characteristics of the staff and intervention and system-level issues, some of which are modifiable. Further research should evaluate strategies which specifically target these modifiable factors to facilitate implementation in practice.]

Solution Focused Brief Therapy in Post-Stroke Aphasia (SOFIA): feasibility and acceptability results of a feasibility randomised wait-list controlled trial
Northcott S., Thomas S., James K., Simpson A., Hirani S., Barnard R., Hilari K.
BMJ Open, vol. 11(8)
August 2021
[**Objectives** The Solution Focused Brief Therapy in Post-Stroke Aphasia feasibility trial had four primary aims: to assess (1) acceptability of the intervention to people with aphasia, including severe aphasia, (2) feasibility of recruitment and retention, (3) acceptability of research procedures and outcome measures, and (4) feasibility of delivering the intervention by speech and language therapists. **Design** Two-group randomised controlled feasibility trial with wait-list design, blinded outcome assessors and nested qualitative research. **Setting** Participants identified via two community NHS Speech and Language Therapy London services and through community routes (eg, voluntary-sector stroke groups). **Participants** People with aphasia at least 6 months post stroke. **Intervention** Solution-focused brief therapy, a psychological intervention, adapted to be linguistically accessible. Participants offered up to six sessions over 3 months, either immediately postrandomisation or after a delay of 6 months. **Outcome measures** Primary endpoints related to feasibility and acceptability. Clinical outcomes were collected at baseline, 3 and 6 months postrandomisation, and at 9 months (wait-list group only). The candidate primary outcome measure was the Warwick-Edinburgh Mental Well-being Scale. Participants and therapists also took part in in-depth interviews. **Results** Thirty-two participants were recruited, including 43.8% with severe aphasia. Acceptability endpoints: therapy was perceived as valuable and acceptable by both participants (n=30 interviews) and therapists (n=3 interviews); 93.8% of participants had ≥2 therapy sessions (90.6% had 6/6 sessions). Feasibility endpoints: recruitment target was reached within the prespecified 13-month recruitment window; 82.1% of eligible participants consented; 96.9% were followed up at 6 months; missing data <0.01%. All five prespecified feasibility progression criteria were met. **Conclusion** The high retention and adherence rates, alongside the qualitative data, suggest the study design was feasible and therapy approach acceptable even to people with severe aphasia. These results indicate a definitive randomised controlled trial of the intervention would be feasible.]

Risk of Stroke

Association Between Excess Leisure Sedentary Time and Risk of Stroke in Young Individuals
Joundi R.A., Patten S.B., Williams J.V.A., and Smith E.E.
Stroke (AHA), Online First
August 2021

[**Background and Purpose**: The association between physical activity (PA) and lower risk of stroke is well established, but the relationship between leisure sedentary time and stroke is less well studied. **Methods**: We used 9 years of the Canadian Community Health Survey between 2000 and 2012 to create a cohort of healthy individuals without prior stroke, heart disease, or cancer. We linked to hospital records to determine subsequent hospitalization or emergency department visit for stroke until December 31, 2017. We quantified the association between self-reported leisure sedentary time (categorized as <4, 4 to <6, 6 to <8, and 8+ hours/day) and risk of stroke using Cox regression models and competing risk regression, assessing for modification by PA, age, and sex and adjusting for demographic, vascular, and social factors. **Results**: There were 143 180 people in our cohort and 2965 stroke events in follow-up. Median time from survey response to stroke was 5.6 years. There was a 3-way interaction between leisure sedentary time, PA, and age. The risk of stroke with 8+ hours of sedentary time was significantly elevated only among individuals <60 years of age who were in the lowest PA quartile (fully adjusted hazard ratio, 4.50 [95% CI, 1.64–12.3]). The association was significant across multiple sensitivity analyses, including adjustment for mood disorders and when accounting for the competing risk of death. **Conclusions**: Excess leisure sedentary time of 8+ hours/day is associated with increased risk of long-term stroke among individuals <60 years of age with low PA. These findings support efforts to enhance PA and reduce sedentary time in younger individuals.]

Association between glycemic control assessed by continuous glucose monitoring and stroke in patients with atrial fibrillation and diabetes mellitus.
Guo J., Wang J., Zhao Z., Yu L.
Annals of Palliative Medicine, vol. 10(8) pp. 9157-9164
August 2021
[**Background:** Both atrial fibrillation (AF) and diabetes mellitus (DM) are documented risk factors for stroke; however, whether glycemic control is associated with the prevalence of stroke remains unclear in patients with AF and DM. The purpose of this study was to investigate the association between glycemic control assessed by continuous glucose monitoring (CGM) and the risk of stroke. **Methods:** In total, 510 AF patients with DM from April 2013 to June 2017 were included. The subcutaneous sensor of CGM was inserted after hospital admission and lasted for 72 consecutive hours. Time in range (TIR), a novel metric derived from CGM, was defined as the time spent in the target range (3.9-10 mmol/L). A logistic regression model was constructed by regarding TIR as a categorical variable and a continuous variable, respectively. **Results:** The mean age of the 510 enrolled patients was 69.8 years. Patients who had previously suffered from stroke had a markedly lower TIR than those without diagnosed stroke (55.1%±19.0% vs. 64.2%±15.1%, P<0.001). Compared to patients with TIR ≤46%, the risk of stroke decreased significantly with increasing TIR quartiles: adjusted odds ratios (ORs) of 0.80 for TIR of 46-65%, 0.64 for TIR of 65-81%, and 0.59 for TIR of >81% (all P<0.001). Taking TIR as a continuous variable, the adjusted OR was 0.89 [95% confidence interval (CI): 0.82-0.95] per 10% increment in TIR. **Conclusions:** This study found that better TIR is independently associated with a decreased risk of stroke in patients with AF and DM.]

Development and validation of a model to estimate the risk of acute ischemic stroke in geriatric patients with primary hypertension
Zheng X., Fang F., Nong W., Feng D., and Yang Y.
BMC Geriatrics, vol. 21
August 2021
[**Objectives**: This study aimed to construct and validate a prediction model of acute ischemic stroke in geriatric patients with primary hypertension. **Methods**: This retrospective file review collected information on 1367 geriatric patients diagnosed with primary hypertension and with and without acute ischemic stroke between October 2018 and May 2020. The study cohort was randomly divided into a training set and a testing set at a ratio of 70 to 30%. A total of 15 clinical indicators were assessed using the chi-square test and then multivariable logistic regression analysis to develop the prediction model. We employed the area under the curve (AUC) and calibration curves to assess the performance of the model and a nomogram for visualization. Internal verification by bootstrap resampling (1000 times) and external verification with the independent testing set determined the accuracy of the model. Finally, this model was compared with four machine learning algorithms to identify the most effective method for predicting the risk of stroke. **Results**: The prediction model identified six variables (smoking, alcohol abuse, blood pressure management, stroke history, diabetes, and carotid artery stenosis). The AUC was 0.736 in the training set and 0.730 and 0.725 after resampling and in the external verification, respectively. The calibration curve illustrated a close overlap between the predicted and actual diagnosis of stroke in both the training set and testing validation. The multivariable logistic regression analysis and support vector machine with radial basis function kernel were the

best models with an AUC of 0.710. **Conclusion**: The prediction model using multiple logistic regression analysis has considerable accuracy and can be visualized in a nomogram, which is convenient for its clinical application.]

Stroke Severity in Transcatheter Aortic Valve Implantation Versus Surgical Aortic Valve Replacement: A Systematic Review and Meta-Analysis
Synnott P., Murphy R.P., Judge C., Costello M., Reddin C., Dennehy K., Loughlin E., Smyth A., Mylotte D. et al
Journal of Stroke and Cerebrovascular Diseases, vol. 30(9)
September 2021
[**Objectives**: An assessment of the comparative incidence of fatal or disabling stroke may influence choice of intervention for patients with severe aortic stenosis. We explored whether transcatheter aortic valve implantation (TAVI) is associated with a lower incidence of fatal or disabling stroke, compared to surgical aortic valve replacement (SAVR). **Materials & Methods**: We classified stroke into two categories; fatal or disabling, or non-disabling, and completed meta-analyses for each. We explored randomised controlled trials to assess the effect publication year, predicted operative risk, and route of TAVI access. **Results**: There was no difference between treatment groups per 100 person years of follow up for disabling or non-disabling stroke outcomes. In a stratified analysis by year of publication, there was a lower rate of fatal or disabling stroke with TAVI in trials published after 2015, compared to those published in 2015 or before (p-interaction = 0.01 at 30 days). Higher proportions of transfemoral route access (>90%), more common in recent trials, were associated with a lower rate of fatal or disabling stroke (p-interaction = 0.03 at 30 days). Lower average surgical risk scores were associated with lower rates of fatal or disabling stroke (p = 0.02 at 30 days). **Conclusion**: We found that treatment of aortic stenosis with TAVI compared with SAVR was not associated with an overall reduced risk in fatal or disabling stroke. Subgroup analyses suggested a lower risk of fatal or disabling stroke with TAVI in situations which reflect contemporary practice.]

Time spent outdoors and risk of myocardial infarction and stroke in middle and old aged adults: Results from the UK Biobank prospective cohort
Miguet M., Venetis S., Rukh G., Lind L., and Schiöth H.B.
Environmental Research, vol. 199
August 2021
[**Background:** Time spent outdoors has been previously related to several cardiovascular risk factors, implying that it may confer either beneficial or harmful effects on cardiovascular health. However, no large population-based studies have examined the relation between time spent outdoors and myocardial infarction and stroke. **Objectives:** We aimed to investigate the longitudinal relation between time spent outdoors and myocardial infarction and stroke in large UK population-based cohort. **Methods:** A total of 446,648 participants from UK Biobank were included in the study of which 431,146 participants (56% females and 44% males with a mean age of 56.4 ± 8.1 years) were followed for a median time of 7 years. Time spent outdoors was self-reported and participants were stratified into quantiles (less than 1.5 [reference group]; 1.5 to 2.4; 2.5 to 3.5 and more than 3.5 h per day outdoors). Myocardial infarction and stroke events were either collected from hospital records and death registries or were self-reported by the participants. Cox proportional hazard regression was used for the analysis. In addition to age and sex, analyses were adjusted for potential demographic (TDI, ethnic background, current employment status), lifestyle (alcohol intake frequency, current tobacco use, sedentary time and moderate-to-vigorous physical activity), health related factors (BMI, systolic and diastolic blood pressure) and environmental indicators (NO2, NOx, PM10, PM2.5-10, PM2,5, noise pollution, % greenspace, % natural environment and % water). **Results:** A 20% increased risk for myocardial infarction incidence was observed among participants who reported spending more than 3.5 h/day outdoors (HR: 1.20, 95% CI: 1.06–1.36) compared to the reference group. A trend was also observed for stroke (HR: 1.14, 95% CI: 0.97–1.34). **Conclusion:** Findings from the present study indicate that spending more than 3.5 h/day outdoors is a risk factor for myocardial infarction and stroke. Future research is needed to further understand the relation between time spent outdoors and cardiovascular disease.]

Stroke services and inpatient facilities

A new protocol reduces median door-to-needle time to the benchmark of 30 minutes in acute stroke treatment
Iglesias Mohedano A.M., García Pastor A., Díaz Otero F., Vázquez Alen P., Martín Gómez M.A., Simón Campo P. et al
Neurología (English Edition), vol. 36(7) pp. 487-494
September 2021

[**Introduction:** Recent analyses emphasise that The Benchmark Stroke Door-to-Needle Time (DNT) should be 30 min. This study aimed to determine if a new in-hospital IVT protocol is effective in reducing door-to-needle time and correcting previously identified factors associated with delays. **Material and methods:** In 2014, we gradually introduced a series of measures aimed to reduce door-to-needle time for patients receiving IVT, and compared it before (2009-2012) and after (2014-2017) the new protocol was introduced. **Results:** The sample included 239 patients before and 222 after the introduction of the protocol. Median overall door-to-needle time was 27 min after the protocol was fully implemented (a 48% reduction on previous door-to-needle time [52 min], P < .001)]. Median door-to-needle time was lower when pre-hospital code stroke was activated (22 min). We observed a 26-min reduction in the median time from onset to treatment (P < .001). After the protocol was implemented, the "3-hour-effect" did not affect door-to-needle time (P = .98). Computed tomography angiography studies performed before IVT were associated with increased door-to-needle time (P < .001); however, the test was performed after IVT was started in most cases. **Conclusions:** Hospital reorganisation and multidisciplinary collaboration brought median door-to-needle time below 30 min and corrected previously identified delay factors. Furthermore, overall time from onset to treatment was also reduced and more stroke patients were treated within 90 min of symptom onset.]

Built environments for inpatient stroke rehabilitation services and care: a systematic literature review
Lipson-Smith R., Pflaumer L., Elf M., Blaschke S-M., Davis A., White M., Zeeman H., and Bernhardt J.
BMJ Open, vol. 11(8)
August 2021
[**Objectives:** To identify, appraise and synthesise existing design evidence for inpatient stroke rehabilitation facilities; to identify impacts of these built environments on the outcomes and experiences of people recovering from stroke, their family/caregivers and staff. **Design:** A convergent segregated review design was used to conduct a systematic review. **Data sources:** Ovid MEDLINE, Scopus, Web of Science and Cumulative Index to Nursing and Allied Health Literature were searched for articles published between January 2000 and November 2020. **Eligibility criteria for selecting studies:** Qualitative, quantitative and mixed-methods studies investigating the impact of the built environment of inpatient rehabilitation facilities on stroke survivors, their family/caregivers and/or staff. **Data extraction and synthesis:** Two authors separately completed the title, abstract, full-text screening, data extraction and quality assessment. Extracted data were categorised according to the aspect of the built environment explored and the outcomes reported. These categories were used to structure a narrative synthesis of the results from all included studies. **Results:** Twenty-four articles were included, most qualitative and exploratory. Half of the included articles investigated a particular aspect of the built environment, including environmental enrichment and communal areas (n=8), bedroom design (n=3) and therapy spaces (n=1), while the other half considered the environment in general. Findings related to one or more of the following outcome categories: (1) clinical outcomes, (2) patient activity, (3) patient well-being, (4) patient and/or staff safety and (5) clinical practice. Heterogeneous designs and variables of interest meant results could not be compared, but some repeated findings suggest that attractive and accessible communal areas are important for patient activity and well-being. **Conclusions**: Stroke rehabilitation is a unique healthcare context where patient activity, practice and motivation are paramount. We found many evidence gaps that with more targeted research could better inform the design of rehabilitation spaces to optimise care.]

How do patients spend their time in stroke rehabilitation units in England? The REVIHR study
Chouliara N., Fisher R., Crosbie B., Guo B., Sprigg N. and Walker N.
Disability and Rehabilitation, vol. 43(16)
August 2021
[**Aim:** To examine how patients spend their time in stroke rehabilitation units in England. **Methods:** We recruited 144 patients within a month after stroke from four stroke rehabilitation units and observed their activity type, interactions and location. Each participant was observed for 1 min every 10-minutes, for a total of 20 h, over three consecutive days. Multilevel modelling was performed to assess differences across sites. **Results:** Across the four sites a total of 12,248 observations were performed. Patients spent on average 37% of the observed time inactive and 60% alone. A health care professional was present for 18% of the observations and patients' most frequent contact was with family members (19%). Patients were mainly physically active in the presence of therapists, but they practiced self-care activities of daily living most frequently in the presence of nursing staff. There were limited opportunities for activity away from the bedside. Significant differences were found between the units, including patients' level of contact with rehabilitation assistants and nursing staff, but not in their time with occupational therapists and physiotherapists. **Conclusions:** Stroke patients in England spend a large proportion of their day

inactive and alone. Opportunities to promote a rehabilitation focused environment may include: a) enhancing the role of rehabilitation assistants, b) supporting nursing staff in maximising opportunities for the practice of activities of daily living and c) involving family members in the rehabilitation process.]

Thrombectomy / Endovascular Treatment

Benefit of endovascular thrombectomy for M2 middle cerebral artery occlusion in the ARISE II study
De Havenon A., Narata A.P., Amelot A., Saver J.L., Bozorgchami H., Mattle H.P., Ribo M., Andersson T., Zaidat O.O.
Journal of NeuroInterventional Surgery, vol. 13(9)
September 2021
[**Background:** The benefit of endovascular thrombectomy for acute ischemic stroke with M2 segment middle cerebral artery occlusion remains controversial, with uncertainty and paucity of data specific to this population. **Objective:** To compare outcomes between M1 and M2 occlusions in the Analysis of Revascularization in Ischemic Stroke with EmboTrap (ARISE II) trial. **Methods:** We performed a prespecified analysis of the ARISE II trial with the primary outcome of 90-day modified Rankin Scale score of 0–2, which we termed good outcome. Secondary outcomes included reperfusion rates and major adverse events. The primary predictor was M2 occlusion, which we compared with M1 occlusion. **Results:** We included 183 patients, of whom 126 (69%) had M1 occlusion and 57 (31%) had M2 occlusion. There was no difference in the reperfusion rates or adverse events between M2 and M1 occlusions. The rate of good outcome was not different in M2 versus M1 occlusions (70.2% vs 69.7%, p=0.946). In a logistic regression model adjusted for age, sex, and baseline National Institutes of Health Stroke Scale score, M2 occlusions did not have a significantly different odds of good outcome compared with M1 occlusions (OR 0.94, 95%CI 0.47 to 1.88, p=0.87). **Conclusion:** In ARISE II, M2 occlusions achieved a 70.2% rate of good outcome at 90 days, which is above published rates for untreated M2 occlusions and superior to prior reports of M2 occlusions treated with endovascular thrombectomy. We also report similar rates of good outcome, successful reperfusion, death, and other adverse events when comparing the M1 and M2 occlusions.]

Efficacy of beveled tip aspiration catheter in mechanical thrombectomy for acute ischemic stroke
Vargas J., Blalock J., Venkatraman A., Anagnostakou V., King R.M., Ewing J.A., Gounis M.J., Turner R.D. et al
Journal of NeuroInterventional Surgery, vol. 13(9)
September 2021
[**Background:** Direct aspiration thrombectomy techniques use large bore aspiration catheters for mechanical thrombectomy. Several aspiration catheters are now available. We report a bench top exploration of a novel beveled tip catheter and our experience in treating large vessel occlusions (LVOs) using next-generation aspiration catheters. **Methods:** A retrospective analysis from a prospectively maintained database comparing the bevel shaped tip aspiration catheter versus non-beveled tip catheters was performed. Patient demographics, periprocedural metrics, and discharge and 90-day modified Rankin Scale (mRS) scores were collected. Patients were divided into two groups based on which aspiration catheter was used. **Results:** Our data showed no significant difference in age, gender, IV tissue plasminogen activator administration, admission NIH Stroke Scale score, baseline mRS, or LVO location between the beveled tip and flat tip groups. With the beveled tip, Thrombolysis in Cerebral Infarction (TICI) 2C or better recanalization was more frequent overall (93.2% vs 74.2%, p=0.017), stent retriever usage was lower (9.1% vs 29%, p=0.024), and patients had lower mRS on discharge (median 3 vs 4, p<0.001) and at 90 days (median 2 vs 4, p=0.008). **Conclusion:** Patients who underwent mechanical thrombectomy with the beveled tip catheter had a higher proportion of TICI 2C or better and had a significantly lower mRS score on discharge and at 90 days.]

Inadvertent hypothermia after endovascular therapy is not associated with improved outcome in stroke due to anterior circulation large vessel occlusion
Hartmann C., Winzer S., Pallesen L-P., Prakapenia A., Siepmann T., Moustafa H., Theilen H., Barlinn J. et al
European Journal of Neurology, vol, 28(8) pp. 2479-2487
August 2021
[**Background and purpose:** Hypothermia may be neuroprotective in acute ischemic stroke. Patients with anterior circulation large vessel occlusion (acLVO) are frequently hypothermic after endovascular therapy (EVT). We sought to determine whether this inadvertent hypothermia is associated with improved outcome. **Methods:** We extracted data of consecutive patients (January 2016 to May 2019) who received EVT for acLVO from our prospective EVT register of all patients screened for EVT at our tertiary stroke center. We assessed functional outcome at 3 months and performed multivariate analysis to calculate adjusted risk ratios (aRRs) for favorable outcome (modified Rankin

Scale scores = 0–2) and mortality across patients who were hypothermic (<36°C) and patients who were normothermic (≥36°C to <37.6°C) after EVT. Moreover, we compared the frequency of complications between these groups. **Results:** Among 837 patients screened, 416 patients received EVT for acLVO and fulfilled inclusion criteria (200 [48.1%] male, mean age = 76 ± 16 years, median National Institutes of Health Stroke Scale score = 16, interquartile range [IQR] = 12–20). Of these, 209 patients (50.2%) were hypothermic (median temperature = 35.2°C, IQR = 34.7–35.7) and 207 patients were normothermic (median temperature = 36.4°C, IQR = 36.1–36.7) after EVT. In multivariate analysis, hypothermia was not associated with favorable outcome (aRR = 0.99, 95% confidence interval [CI] = 0.75–1.31) and mortality (aRR = 1.18, 95% CI = 0.84–1.66). More hypothermic patients suffered from pneumonia (36.4% vs. 25.6%, p = 0.02) and bradyarrhythmia (52.6% vs. 16.4%, p < 0.001), whereas thromboembolic events were distributed evenly (5.7% vs. 6.8%, not significant). **Conclusions:** Inadvertent hypothermia after EVT for acLVO is not associated with improved functional outcome or reduced mortality but is associated with an increased rate of pneumonia and bradyarrhythmia in patients with acute ischemic stroke.]

Mobile Interventional Stroke Teams Improve Outcomes in the Early Time Window for Large Vessel Occlusion Stroke
Morey J.R., Zhang X., Marayati N.F., Matsoukas S., Fiano E., Oxley T., Dangayach N., Stein L.K., Fara M.G. et al
Stroke (AHA), vol. 52(9)
September 2021
[**Background and Purpose**: Endovascular thrombectomy for large vessel occlusion stroke is a time-sensitive intervention. The use of a Mobile Interventional Stroke Team (MIST) traveling to Thrombectomy Capable Stroke Centers to perform endovascular thrombectomy has been shown to be significantly faster with improved discharge outcomes, as compared with the drip-and-ship (DS) model. The effect of the MIST model stratified by time of presentation has yet to be studied. We hypothesize that patients who present in the early window (last known well of ≤6 hours) will have better clinical outcomes in the MIST model. **Methods**: The NYC MIST Trial and a prospectively collected stroke database were assessed for patients undergoing endovascular thrombectomy from January 2017 to February 2020. Patients presenting in early and late time windows were analyzed separately. The primary end point was the proportion with a good outcome (modified Rankin Scale score of 0–2) at 90 days. Secondary end points included discharge National Institutes of Health Stroke Scale and modified Rankin Scale. **Results**: Among 561 cases, 226 patients fit inclusion criteria and were categorized into MIST and DS cohorts. Exclusion criteria included a baseline modified Rankin Scale score of >2, inpatient status, or fluctuating exams. In the early window, 54% (40/74) had a good 90-day outcome in the MIST model, as compared with 28% (24/86) in the DS model (P<0.01). In the late window, outcomes were similar (35% versus 41%; P=0.77). The median National Institutes of Health Stroke Scale at discharge was 5.0 and 12.0 in the early window (P<0.01) and 5.0 and 11.0 in the late window (P=0.11) in the MIST and DS models, respectively. The early window discharge modified Rankin Scale was significantly better in the MIST model (P<0.01) and similar in the late window (P=0.41). **Conclusions**: The MIST model in the early time window results in better 90-day outcomes compared with the DS model. This may be due to the MIST capturing high-risk fast progressors at an earlier time point.]

Stroke thrombectomy complication management
Pilgram-Pastor S.M., Piechowiak E.I., Dobrocky T., Kaesmacher J., Hollander J.D., Gralla J., and Mordasini P.
Journal of Neurointerventional Surgery, vol. 13(10) pp. 912-917
October 2021
[Endovascular mechanical thrombectomy (EVT) is widely accepted as the first-line treatment for acute ischemic stroke in patients with large vessel occlusion. Being an invasive treatment, this method is associated with various preoperative, perioperative, and postoperative complications. These complications may influence peri-interventional morbidity and mortality and therefore treatment efficacy and clinical outcome. The aim of this review is to discuss the most common types of complications associated with EVT, the probable mechanisms of injury, and effective methods to manage and prevent complications.]

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.