



# 2022 Annual Report

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Neuroscience Research Department

# The Neuroscience Research Mission

The mission of the Allina Health Neuroscience Research Department is to advocate and advance neuroscience research across numerous clinical programs with the goal of improving patient care. Together, we strive to promote, foster, and sustain the highest quality research while developing methods to enhance care, manage side effects, and improve the cost-effectiveness of treatment modalities.



## 2022 Updates

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The Allina Neuroscience Research Department provides comprehensive research support services to all individuals affiliated with Neuroscience Clinical Programs at Allina Health who are interested in developing research projects leading to improvements in the prevention, diagnosis, and treatment of neurological diseases. Some of these support services include:

- Assistance with research project development and design
- IRB submission and regulatory management
- Research grant preparation and budgetary management
- Database development and management
- Biostatistician support
- Poster and slide preparation for scientific presentation
- Clinical trial operations and regulatory management

In 2022, highlights of the Neuroscience Research Program include:

- A total of 5 new studies were begun, with 3 clinical trials and 2 investigator-initiated projects
- 30 studies were active across all Neuroscience sections
- Department Standard Operating Procedures were reviewed and updated, and new staff onboarding procedures were developed
- \$43,073.27 in Allina Health Foundation grant funding was awarded to the Neuroscience Research Program
- 286 patients actively participated in studies from January-December 2022
- Data was abstracted from 411 patient's records for research purposes
- The Neuroscience Research Team worked with the Allina Health Core Research Team to ensure staffing needs were met
- Duncan Nyangau, BS joined the Neuroscience Research team as a Clinical Research Specialist
- Payton Kaiser, BA joined the Neuroscience Research team as a Senior Clinical Research Regulatory Specialist
- Nimco Essa, BS joined the Neuroscience Research team as a Clinical Research Specialist
- Marie Meyer, MA, CCC-SLP assumed the role of Manager of the Neuroscience Research team
- Riley Johnke, BS joined the Neuroscience Research team as a Clinical Research Specialist
- Katie Johnson, AAS joined the Neuroscience Research team as a Clinical Research Specialist

# Selected Study Synopses

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## **Dose Responsiveness as a Measure of Clinical Effectiveness During Neuromonitored Spine Surgery**

**Principal Investigator: Stanley A. Skinner, MD;**

Intraoperative neurophysiological monitoring (IONM) measures neural function and integrity during surgical procedures, allowing the surgical team to take immediate and corrective actions to prevent a bad outcome. ANW's IONM department, recognized for its creation of national standards, remains committed to improved clinical outcomes through innovation. *Dose responsiveness as a measure of clinical effectiveness during neuromonitored spine surgery* is an observational research study using a prospective neuromonitoring database to enhance the evidence-base for IONM.

Since December 2020, 239 patients undergoing cervical and thoracic extradural spine surgery (spinal cord level) at ANW have been included in this prospective database study after providing informed consent. 69 participants have completed all longitudinal measures. We aim to include 500 participants overall. In 2023, the Study Team looks forward to collaborating further with additional clinical partners, in an effort to offer this project to additional patients. We expect these collaborations to increase enrollment by more than 25%.

Expanding the IONM evidence base allows for improved value-based decisions on how IONM is ordered and how it should be executed during spinal surgery. Hence, the results generated from this study will help us learn more about predicting outcomes for people who have monitoring during their surgery and will help us to fine-tune our IONM protocols.

## **THUNDER: Acute Ischemic Stroke Study with the Penumbra System® including Thunderbolt™ Aspiration Tubing**

**Principal Investigator: Dr. Josser Delgado**

Acute Ischemic Stroke (AIS) due to Large Vessel Occlusion (LVO) carries the highest mortality rate among AIS, and achieving recanalization with a single pass is vital to improving clinical outcomes and reducing overall procedure time. *THUNDER: Acute Ischemic Stroke Study with the Penumbra System® including Thunderbolt™ Aspiration Tubing* is a prospective, single-arm multi-center clinical trial assessing the safety and efficacy of the Penumbra System® including Thunderbolt™ Aspiration Tubing in this high-risk population.

The Penumbra System is a mechanical neuro-thrombectomy system that removes thrombi through a novel aspiration technology. This process hopes to improve the clinical outcomes associated with acute ischemic stroke secondary to large vessel occlusion.

THUNDER was opened for enrollment at our site in December 2022 and is led by the site Principal Investigator, Dr. Josser Delgado. The results generated from this study should allow for improved treatment of Acute Ischemic Stroke.

## **RHAPSODY-2: Recombinant variant of Human Activated Protein C in combination with tissue plasminogen activator (thrombolysis) in moderately severe acute hemispheric ischemic stroke.**

**Principal Investigator: Dr. Ganesh Asaithambi**

RHAPSODY-2 is a multi-center, phase 3 trial is designed to evaluate 3K3A-APC, a recombinant variant of Human Activated Protein C, in combination with thrombolytics following acute ischemic stroke. As part of the StrokeNet trial consortium – an NIH-funded, international, organization established to facilitate the development, promotion, and conduct of multi-site clinical trials – Allina Health was invited to participate systemwide in this upcoming clinical trial.

*RHAPSODY-2: Recombinant variant of Human Activated Protein C in combination with tissue plasminogen activator (thrombolysis) in moderately severe acute hemispheric ischemic stroke* is a randomized, placebo-controlled, double-blinded phase III trial. This study is anticipated to significantly benefit patients experiencing moderate to severe Acute Ischemic Stroke (AIS). Participants will receive their entire treatment during their hospital course, receiving either 3K3A-APC or placebo at planned periods leading up to their discharge.

Allina Health anticipates enrolling participants at all their Metro Hospitals – Abbott Northwestern Hospital, United Hospital, and Mercy Hospital. While the study has not yet begun, Allina Health System has been selected to participate in the project, and is planning to commence enrollment in the spring of 2023.

## **GBM AGILE Global Adaptive Trial Master Protocol: An International, Seamless Phase II/III Response Adaptive Randomization Platform Trial Designed to Evaluate Multiple Regimens in Newly Diagnosed and Recurrent Glioblastoma (GBM)**

**Principal Investigator: Dr. Andrea Wasilewski**

GBM AGILE is a Phase 2/3 clinical trial enrolling patients with newly diagnosed or recurrent IDH wild-type glioblastoma. This multi-arm platform trial concurrently evaluates multiple drugs and drug combinations from various pharmaceutical companies in an effort to improve progression-free and overall survival. The unique study design allows for continuous evaluation of experimental treatments while simultaneously adding promising new drugs.

Allina Health has participated in four separate arms of the trial since inauguration in 2019, and in 2022, eight patients were enrolled as participants. By the end of 2022, two arms were closed to enrollment but looking forward to 2023: Allina Health has been invited to participate in the Enhanced Safety Management (ESM) for two new treatments.

This ESM will include supplemental safety assessments and involve interdisciplinary teams at Abbott Northwestern Hospital. Once the Data Safety Monitoring Board (DSMB) has completed their initial evaluation of the treatments, the arms may open to other regional sites. By serving as an ESM site, we will offer patients who have new and recurrent glioblastoma at Allina Health the earliest opportunity to enroll in these new treatment arms.

# Neuroscience Research Trials

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January – December 2022

## Neuro-Oncology

1. Trusheim J, Bruns P, McDonald W: A Phase II Clinical Trial Evaluating DCVax®-Brain, Autologous Dendritic Cells Pulsed With Tumor Lysate Antigen For The Treatment Of Glioblastoma Multiforme (GBM)
2. Trusheim J, Bruns P: A Randomized, Multicenter, Phase 2 Study of DSP-7888 Dosing Emulsion in Combination with Bevacizumab versus Bevacizumab Alone in Patients with Recurrent or Progressive Glioblastoma following Initial Therapy
3. Melendez V, Jackson K, Wasilewski A: Identification of genetic markers that predict responsiveness to Tumor Treating Fields
4. Wasilewski A, Trusheim J, Bruns P, Picconi M: A Trial to Evaluate Multiple Regimens in Newly Diagnosed and Recurrent Glioblastoma (GBM AGILE)
5. Wasilewski A, Trusheim J, Bruns P, Picconi M: Pivotal, Randomized, Open-label Study of Optune® Concomitant With RT & TMZ for the Treatment of Newly Diagnosed GBM (EF-32)
6. Trusheim J, Sullivan P, Bruns P: Pivotal, open-label, randomized study of radiosurgery with or without Tumor Treating Fields (TTFields) for 1-10 brain metastases from non-small cell lung cancer (NSCLC)
7. McDonald W: Glioma Longitudinal Analysis Consortium (GLASS)
8. Bruns P, Wasilewski A: Management and outcomes of primary CNS lymphoma at the Givens Brain Tumor Center
9. Trusheim J: Minnesota Gamma Tiles Data Network. (GT Data Network)
10. Wasilewski A, Bruns P, Monyak D, Picconi M, Trusheim J: A Multicenter Observational Study of GammaTile™ Surgically Targeted Radiation Therapy (STaRT) in Intracranial Brain Neoplasms
11. Wasilewski A, Trusheim J, Bruns P, Picconi M: A Randomized, Double-Blind, Placebo-Controlled Phase 3 Study of Enzastaurin Added to Temozolomide During and Following Radiation Therapy in Newly Diagnosed Glioblastoma Patients Who Possess the Novel Genomic Biomarker DGM1

## Neuro-Physiology

1. Skinner S, Strommen J, Passini B: Dose responsiveness as a measure of clinical effectiveness during neuromonitored spine surgery
2. Strommen J, Skinner S, Passini B: Comparison of three approaches of Motor Evoked Potential recording to detect a more reliable measure to predict and prevent nerve damage during spine surgery

## Neurovascular/Stroke

1. Asaithambi G, Hanson S, Corry J, Monita J, Thacker T, Massaquoi R: Atrial Cardiopathy & Antithrombotic Drugs in Prevention After Cryptogenic Stroke (ARCADIA)
2. Asaithambi G, Hanson S, Corry J, Monita J, Thacker T, Massaquoi R: ARCADIA-Cognition and Silent Infarcts (ARCADIA-CSI)
3. Corry J, Asaithambi, Shaik A, Hanson S, Thacker T, Massaquoi R, Gazich E: Anticoagulation in Intracerebral Hemorrhage (ICH) Survivors for Stroke Prevention and Recovery (ASPIRE)
4. Corry J: Conivaptan for the Reduction of Cerebral Edema in Intracerebral hemorrhage- Comparison of PHE volumes to historical cohort
5. Kayan Y, Delgado J: Effectiveness of Pipeline Embolization Devices for Distal Cerebral Aneurysm Treatment
6. Kayan Y, Delgado J, Copelan A: Post-Market Surveillance Study to Evaluate the Long Term Safety and Effectiveness of the WEB® Device
7. Kayan Y, Delgado J, Copelan A: Perfusion imaging to identify posterior circulation candidates for thrombectomy
8. Delgado J, Kayan Y: WEB-IT PMA: The WEB® Intracapsular Therapy Study for United States pre-market approval of the WEB® device for The endovascular treatment of wide neck bifurcation intracranial aneurysms (WEB-IT)
9. Delgado J, Kayan Y: Compassionate use of the WEB intracapsular aneurysm embolization device
10. Delgado J, Kayan Y, Copelan A: Stroke Thromboembolism Registry of Imaging and Pathology (STRIP)
11. Delgado J, Kayan Y: miRNA Expression in Aneurysm Healing (miRNA)
12. Delgado J, Kayan Y, Copelan A: Adequate Lateral Compression Is A Strong Independent Predictor Of Aneurysm Occlusion And Retreatment After Endovascular Treatment With WEB

13. Delgado J, Kayan Y, Copelan A: Computational Fluid Dynamics (CFD) Analysis of Aneurysms Treated with Intracranial Devices
14. Delgado J, Kayan Y, Copelan A: Acute Ischemic Stroke Study with the Penumbra System® including Thunderbolt™ Aspiration Tubing
15. Asaithambi G, Young M, Tarrel R, Roohani P, Milner S: Atrial Cardiopathy and Antithrombotic Drugs In Prevention After Cryptogenic Stroke (ARCADIA) [ANW]
16. Asaithambi G, Young M, Tarrel R, Roohani P, Milner S: Atrial Cardiopathy and Antithrombotic Drugs In prevention After cryptogenic stroke - Cognition and Silent Infarcts (ARCADIA-CSI) [ANW]
17. Young M, Asaithambi G, Tarrel R, Roohani P, Milner S: Anticoagulation in Intracerebral Hemorrhage (ICH) Survivors for Stroke Prevention and Recovery (ASPIRE) [ANW]



# Publications, Presentations, and Book Chapters

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## Publications

Tong X, Yang Q, **Asaithambi G**, Merritt RK. Venous thromboembolism among Medicare acute ischaemic stroke patients with and without COVID-19. *Stroke Vasc Neurol*. 2022 Nov 15:svn-2022-001814. doi: 10.1136/svn-2022-001814. Epub ahead of print. PMID: 36379616.

Liau L, Ashkan K, Brem S, Campian J, **Trusheim J**, Iwamoto F, Tran D, et al. 2022. “Association of Autologous Tumor Lysate-Loaded Dendritic Cell Vaccination with Extension of Survival among Patients with Newly Diagnosed and Recurrent Glioblastoma.” *JAMA Oncology*, November. <https://doi.org/10.1001/jamaoncol.2022.5370>.

**Asaithambi G, Tipps ME**. Effect of Intensive Glucose Control on Outcomes of Hyperglycemic Stroke Patients Receiving Mechanical Thrombectomy: Secondary Analysis of the SHINE Trial. *J Neurosurg Anesthesiol*. 2022 Oct 1;34(4):415-418. doi: 10.1097/ANA.0000000000000795. Epub 2021 Aug 5. PMID: 34354023.

Mereuta OM, Abbasi M, Arturo Larco JL, Dai D, Liu Y, Arul S, Kadirvel R, Hanel RA, Yoo AJ, Almekhlafi MA, Layton KF, **Delgado Almandoz JE**, Kvamme P, Mendes Pereira V, Jahromi BS, Nogueira RG, Gounis MJ, Patel B, Aghaebrahim A, Sauvageau E, Bhuva P, Soomro J, Demchuk AM, Thacker IC, **Kayan Y, Copelan A**, Nazari P, Cantrell DR, Haussen DC, Al-Bayati AR, Mohammad M, Pisani L, Rodrigues GM, Puri AS, Entwistle J, Meves A, Savastano L, Cloft HJ, Nimjee SM, McBane II RD, Kallmes DF, Brinjikji W. Correlation of von Willebrand factor and platelets with acute ischemic stroke etiology and revascularization outcome: an immunohistochemical study. *J Neurointerv Surg*. 2022 May 20:neurintsurg-2022-018645. doi: 10.1136/neurintsurg-2022-018645. Epub ahead of print. PMID: 35595407.

**Asaithambi G**, Tong X, Lakshminarayan K, Coleman King SM, George MG, Odom EC. Emergency Medical Services Utilization for Acute Stroke Care: Analysis of the Paul Coverdell National Acute Stroke Program, 2014-2019. *Prehosp Emerg Care*. 2022 May-Jun;26(3):326-332. doi: 10.1080/10903127.2021.1877856. Epub 2021 Feb 22. PMID: 33464940; PMCID: PMC8380252.

Brat DJ, Aldape K, Bridge JA, Canoll P, Colman H, Hameed MR, Harris BT, Hattab EM, Huse JT, Jenkins RB, Lopez-Terrada DH, **McDonald WC**, Rodriguez FJ, Souter LH, Colasacco C, Thomas NE, Yount MH, van den Bent MJ, Perry A. Molecular Biomarker Testing for the Diagnosis of Diffuse Gliomas. *Arch Pathol Lab Med*. 2022 May 1;146(5):547-574. doi: 10.5858/arpa.2021-0295-CP. PMID: 35175291; PMCID: PMC9311267.

Brinjikji W, Abbasi M, Mereuta OM, Fitzgerald S, Larco JA, Dai D, Kadirvel R, Nogueira RG, Kvamme P, Layton KF, **Delgado JE**, Hanel RA, Pereira VM, Almekhlafi MA, Yoo AJ, Jahromi BS, Gounis MJ, Patel BM, Savastano LE, Cloft HJ, Haussen DC, Al-Bayati A, Mohammad M, Pisani L, Rodrigues G, Thacker IC, **Kayan Y, Copelan AZ**, Aghaebrahim A, Sauvageau E,

Demchuk AM, Bhuva P, Soomro J, Nazari P, Cantrell DR, Puri AS, Doyle KM, Entwistle J, Kallmes DF. Histological composition of retrieved emboli in acute ischemic stroke is independent of pre-thrombectomy alteplase use. *J Stroke Cerebrovasc Dis.* 2022 Apr;31(4):106376. doi: 10.1016/j.jstrokecerebrovasdis.2022.106376. Epub 2022 Feb 17. PMID: 35183984.

Mattay RR, Miner L, **Copelan AZ**, Davtyan K, Schmitt JE, Church EW, Mamourian AC. Unruptured Arteriovenous Malformations in the Multidetector Computed Tomography Era: Frequency of Detection and Predictable Failures. *J Clin Imaging Sci.* 2022 Feb 18;12:5. doi: 10.25259/JCIS\_200\_2021. PMID: 35242451.

Liu Y, Brinjikji W, Abbasi M, Dai D, Arturo Larco JL, Madhani SI, Shahid AH, Mereuta OM, Nogueira RG, Kvamme P, Layton KF, **Delgado Almandoz JE**, Hanel RA, Mendes Pereira V, Almekhlafi MA, Yoo AJ, Jahromi BS, Gounis MJ, Patel B, Fitzgerald S, Doyle K, Haussen DC, Al-Bayati AR, Mohammaden M, Pisani L, Rodrigues GM, Thacker IC, **Kayan Y, Copelan A**, Aghaebrahim A, Sauvageau E, Demchuk AM, Bhuva P, Soomro J, Nazari P, Cantrell DR, Puri AS, Entwistle J, Kadirvel R, Cloft HJ, Kallmes DF, Savastano L. Quantification of clot spatial heterogeneity and its impact on thrombectomy. *J Neurointerv Surg.* 2022 Dec;14(12):1248-1252. doi: 10.1136/neurintsurg-2021-018183. Epub 2021 Dec 15. PMID: 34911736.

Mokin M, Waqas M, Fifi JT, De Leacy R, Fiorella D, Levy EI, Snyder K, Hanel RA, Woodward K, Chaudry I, Rai AT, Frei D, **Delgado Almandoz JE**, Kelly M, Arthur AS, Baxter BW, English J, Linfante I, Fargen KM, Turk A, Mocco J, Siddiqui AH. Intravenous alteplase has different effects on the efficacy of aspiration and stent retriever thrombectomy: analysis of the COMPASS trial. *J Neurointerv Surg.* 2022 Oct;14(10):992-996. doi: 10.1136/neurintsurg-2021-017943. Epub 2021 Oct 14. PMID: 34649935.

Lauzier DC, Root BK, **Kayan Y, Almandoz JED**, Osbun JW, Chatterjee AR, **Whaley KL, Tipps ME**, Moran CJ, Kansagra AP. Pipeline embolization of MCA aneurysms in the M2-M4 segment: Dual center study and meta-analysis. *Clin Neurol Neurosurg.* 2022 Jan;212:107063. doi: 10.1016/j.clineuro.2021.107063. Epub 2021 Nov 25. PMID: 34864490.

McDougall CG, Diaz O, Boulos A, Siddiqui AH, Caplan J, Fifi JT, Turk AS, **Kayan Y**, Jabbour P, Kim LJ, Hetts SW, Cooke DL, Dowd CF. Safety and efficacy results of the Flow Redirection Endoluminal Device (FRED) stent system in the treatment of intracranial aneurysms: US pivotal trial. *J Neurointerv Surg.* 2022 Jun;14(6):577-584. doi: 10.1136/neurintsurg-2021-017469. Epub 2021 Jul 19. PMID: 34282038; PMCID: PMC9120407.

Mereuta OM, Abbasi M, Fitzgerald S, Dai D, Kadirvel R, Hanel RA, Yoo AJ, Almekhlafi MA, Layton KF, **Delgado Almandoz JE**, Kvamme P, Mendes Pereira V, Jahromi BS, Nogueira RG, Gounis MJ, Patel B, Aghaebrahim A, Sauvageau E, Bhuva P, Soomro J, Demchuk AM, Thacker IC, **Kayan Y, Copelan A**, Nazari P, Cantrell DR, Haussen DC, Al-Bayati AR, Mohammaden M, Pisani L, Rodrigues GM, Puri AS, Entwistle J, Meves A, Arturo Larco JL, Savastano L, Cloft HJ, Kallmes DF, Doyle KM, Brinjikji W. Histological evaluation of acute ischemic stroke thrombi may indicate the occurrence of vessel wall injury during mechanical thrombectomy. *J*

Neurointerv Surg. 2022 Apr;14(4):356-361. doi: 10.1136/neurintsurg-2021-017310. Epub 2021 May 11. PMID: 33975922; PMCID: PMC8581068.

Lauzier DC, Root BK, **Kayan Y**, **Almandoz JED**, Osbun JW, Chatterjee AR, **Whaley KL**, **Tipps ME**, Moran CJ, Kansagra AP. Pipeline embolization of proximal middle cerebral artery aneurysms: A multicenter cohort study. Interv Neuroradiol. 2022 Feb;28(1):50-57. doi: 10.1177/15910199211015578. Epub 2021 May 5. PMID: 33951971; PMCID: PMC8905083.

Strowd RE, Dunbar E, Gan HK, Kruz S, Jordan JT, Mandel JJ, Nevel KS, Taylor JW, Ulrich NJ, Welch MR, **Wasilewski A**, Mrugala MM. 2022. "Practical Guidance for Telemedicine Use in Neuro-Oncology." Neuro-Oncology Practice, January. <https://doi.org/10.1093/nop/npac002>.

**Wasilewski, A**, and Mohile, N. 2022. "Tele-Neuro-Oncology: Current Practices and Future Directions." Current Oncology Reports, January. <https://doi.org/10.1007/s11912-021-01176-x>.

**Asaithambi G**, Tong X, Coleman King SM, George MG. Contemporary Trends in the Treatment of Mild Ischemic Stroke with Intravenous Thrombolysis: Paul Coverdell National Acute Stroke Program. Cerebrovasc Dis. 2022;51(1):60-66. doi: 10.1159/000517969. Epub 2021 Aug 17. PMID: 34515074; PMCID: PMC8810725.

Prell J, **Skinner S**. EMG monitoring. Handb Clin Neurol. 2022;186:67-81. doi: 10.1016/B978-0-12-819826-1.00002-8. PMID: 35772900.

**Strommen JA**, **Skinner S**, Crum BA. Neurophysiology during peripheral nerve surgery. Handb Clin Neurol. 2022;186:295-318. doi: 10.1016/B978-0-12-819826-1.00022-3. PMID: 35772892.

**Skinner S**, Guo L. Intraoperative neuromonitoring during surgery for lumbar stenosis. Handb Clin Neurol. 2022;186:205-227. doi: 10.1016/B978-0-12-819826-1.00005-3. PMID: 35772887.

Nelson AT, Bendel A, Skrypek M, Patel S, Tabori U, **McDonald W**, Schultz KAP. Leptomeningeal Dissemination of Low-Grade Neuroepithelial Tumor with FGFR1\_TACC1 Fusion with Clinical and Radiographic Response to Pazopanib and Topotecan. Pediatr Neurosurg. 2022;57(1):63-68. doi: 10.1159/000519889. Epub 2021 Nov 8. PMID: 34749374.

## Presentations

**Bruns P.** *Basics of Brain Tumors*. Presented to Neurological staff at Abbott Northwestern Hospital on December 19, 2022.

**Wasilewski, A.** “Brain Tumors and Epilepsy.” Presentation. Presented for the Minnesota Epilepsy Group, December 2022.

**Roohani P.** Why We Do What We Do: Stroke. Allina Health Neurology 2022 November 14.

**Delgado Almandoz JE,** Kayan Y, Copelan A, Ertelt, A, Scholz JM. La compresión lateral adecuada es el predictor independiente más importante de oclusión y retratamiento de aneurismas cerebrales tratados con el dispositivo Woven EndoBridge (WEB). Presented as an oral scientific presentation at the **Sociedad Iberoamericana de Neurorradiología Diagnóstica y Terapéutica 32nd Annual Meeting** in Montevideo, Uruguay on October 27th, 2022.

**Delgado Almandoz JE,** Kayan Y, Copelan A, Ertelt, A, Scholz JM. La Tasa de Oclusión de Aneurismas Disminuye a Medida que el Ancho del Woven EndoBridge Aumenta Aún con Compresión Lateral Adecuada. Presented as an oral scientific presentation at the **Sociedad Iberoamericana de Neurorradiología Diagnóstica y Terapéutica 32nd Annual Meeting** in Montevideo, Uruguay on October 27th, 2022.

**Roohani P.** Anticoagulation After Ischemic and Hemorrhagic Stroke. Allina Health Neurology 2022 October 4.

**Roohani P.** EMS Talk. Allina Health Neurology 2022 August.

**Roohani P.** Telestroke and Teleneurology. Allina Health Neurology. 2022 August 15.

**Roohani P.** Emergent Brain and Vascular Imaging in Stroke. American Heart Association Minnesota Stroke Webinar 2022 July 21.

**Roohani P.** Lytic Benefit. Alina Health Neurology. 2022 June 14.

**Asaithambi G.** *Making Stroke Care Accessible*. Minnesota Department of Health Stroke Program Monthly Webinar 2022 August: St. Paul, MN.

Macher, J, and **Wasilewski, A.** “Feasibility of an Electronic Steroid Toxicity Monitoring Program in Patients with Malignant Gliomas.” Poster Presentation. Presented at the 2022 American Academy of Neurology 74th Annual Meeting, April 2022.

**Wasilewski, A.** “The Power of Lifestyle Medicine: How Nutrition, Movement, Sleep, and Connection Can Change Your Life.” Presentation. Presented at the American Academy of Neurology Annual Meeting, April 2022.

**Wasilewski, A.** “Fireside Chat: Self-Compassion – Learning to Ignore Your Inner Critic.” Presentation. Presented at the American Academy of Neurology Annual Meeting, April 2022.

**Roohani P.** Abbott Northwestern Hospital Stroke Case Review. Allina Health Neurology 2022 March 7.

**Tarrel R.** *Arterial Dissection and Atrial Fibrillation*. 2022.

**Tarrel R.** *Stroke Mimics*. 2022.

**Tarrel R.** *Neurology Rotation for Internal Medicine Residents*. 2022.

## **Book Chapters**

**Skinner, S.** In Nuwer, M and MacDonald, D, editors. Intraoperative Monitoring: Handbook of Clinical Neurology, 2nd edition. Elsevier, 2022. *Monitoring Lumbar Stenosis and Fusion Surgery; Neurophysiology during Peripheral Nerve Surgery; EMG and Peripheral Monitoring Techniques*.

**Skinner, S.** In Koht A, Sloan T, Toleikis, JR, editors. Monitoring the Nervous System for Anesthesiologists and Other Health Care Professionals, 3rd Edition. Springer, in preparation. *Intraoperative Electromyography*.

## **Public Interviews**

**(Yasha Kayan)** 2022. “Brain Aneurysms.” Interviewed by Susie Jones. WCCO Radio. 02 October 2022.