SECOND NEUROPEDIA NEUROSCIENCE CONFERENCE 2026 - (NNC II)

مؤتمر نيوروبيديا الثاني للعلوم العصبية

NOVEMBER 13, 2026
FRIDAY









UNDER THE PATRONAGE OF THE PRESIDENT OF MUTAH UNIVERSITY, PROF. SALAMEH AL-NUAIMAT,

WE ANNOUNCE

THE 2ND NEUROPEDIA NEUROSCIENCE CONFERENCE 2026 NNC II

HELD AT THE AYASS HOTEL, AMMAN, JORDAN.

NOVEMBER 13, 2026
FRIDAY

تحت رعاية معالي رئيس جامعة مؤتة،
الأستاذ الدكتور سلامة النعيمات

نعلن عن

مؤتمر نيوروبيديا الثاني للعلوم العصبية

في فندق "أياس"، عمّان، الأردن



Neuropedia Founder



NNC 2026 president



NNC 2026 vice president



NNC 2026 general sacrtare

About Neuropedia

About Our Organization

Neuropedia for Training and Scientific Research is a pioneering non-governmental organization (NGO) based in Amman, Jordan, founded and directed by Dr. Omar Fatehi Mohammad Jbarah. Neuropedia connects medical students, residents, researchers, and specialists worldwide, working to advance neurological and neurosurgical education, research, and clinical practice.

Vision and Strategic Objectives

Neuropedia is committed to three main objectives:

- Empowering Future Physicians: Providing medical students and residents with clinical training, research mentorship, and international learning opportunities.
- Advancing Scientific Excellence: Promoting high-quality research, specialized training, and evidence-based practice in neurology, neurosurgery, and endovascular interventions.
- Building Global Partnerships: Fostering collaborations with academic institutions, medical associations, and international societies to promote scientific exchange and research.

About NNC 2026

2nd Neuropedia Neuroscience Conference (NNC II)
Bridging Innovation and Clinical Excellence
Conference Overview
Taking place on November 13, 2026, at Ayass Hotel, Amman, Jordan, NNC II builds on the success of its inaugural edition, bringing together medical students, residents, researchers, and leading specialists to advance neuroscience education and clinical practice.
Vision and Objectives
NNC II aims to:

- Showcase the latest advances in neurology, neurosurgery, and endovascular interventions.
- Empower young physicians through education, research, and mentorship.
- Foster regional and international scientific collaboration.

Scientific Highlights
The conference features expert lectures, interactive workshops, clinical case discussions, and research presentations, creating opportunities for learning, networking, and academic exchange.
Our Mission
To inspire innovation, strengthen scientific collaboration, and advance neuroscience education and patient care across the region.

PREFACE

Dr Amer Al-Omary
Dr. Omer Jbarah
Dr. Mohammad Al-Rawashdeh
Mohammed Albakri



Dr. Amer Al-Omary

As Conference President, it is my privilege to welcome distinguished colleagues, researchers, and clinicians to the second NeuroPedia Neuroscience Conference. Today, we stand at the intersection of surgical innovation, academic rigor, and compassionate care.

Guided by our commitment to advancing sciences and transforming lives, our core mission is to bridge early-career students, emerging researchers, and specialists into one unified scientific dialogue. Through our keynote lectures, hands-on workshops, and innovative research sessions, we aim to pair foundational expertise with fresh insight, inspiring the next generation of leadership while delivering transformative outcomes for our patients.



Dr. Omar Jbarah

It is with great pride and enthusiasm that I welcome you to the 2nd Neuropedia Neuroscience Conference (NNC II), taking place on November 13, 2026, at Ayass Hotel, Amman, Jordan.

Since its establishment, Neuropedia has been committed to bridging knowledge gaps, fostering academic exchange, and connecting medical students, residents, and specialists across the region. Building on the success of our inaugural conference, NNC II marks another important step toward advancing neurological and neurosurgical education, research, and collaboration.

This year's program brings together distinguished regional and international experts to explore the latest advances in neurosurgery, neurovascular interventions, neuro-oncology, and clinical neuroscience, while providing valuable opportunities for learning, mentorship, and scientific discussion.

As Vice President and Head of the Organizing Committee, I am proud of the dedication and teamwork that have made this event possible. We hope this conference inspires new ideas, meaningful collaborations, and a shared commitment to improving patient care.

Welcome to Amman, and welcome to NNC II!

Dr. Omar Fatehi Mohammad Jbarah
Vice President and Head of the Organizing Committee
2nd Neuropedia Neuroscience Conference (NNC II)
Founder and General Director, Neuropedia



Mohammad Al-Bakri

Meet Our Team



Neuropedia Founder



NNC 2026 president



NNC 2026 vice president



NNC 2026 general sacrtare

MEDIA TEAM



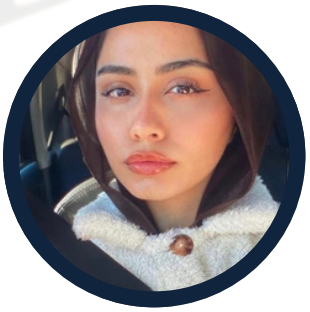














LOGESTICS TEAM



















SCIENTIFIC TEAM













SPONSERS TEAM









OUTREACH TEAM











AGENDA

NNC II

Scientific Programme

The Second NeuroPedia Neuroscience Conference

DATE	VENUE	IN PARTNERSHIP WITH
Friday, 13 November 2026	Ayass Hotel, Amman	Faculty of Medicine, Mutah University

11	41	25	12	7
	ORAL PRESENTATIONS	POSTERS	WORKSHOPS	HALLS

WELCOME

Welcome to NNC II. Today neurology, neurosurgery and psychiatry share one room, and most of the work you will hear belongs to residents, interns and students whose abstracts were accepted on merit alone — a platform given only to those who already have one teaches no one. Ask questions, sit where you would not usually sit, and leave knowing someone you did not know this morning.

Mohammad Al-Bakri

CHAIR, ORGANISING COMMITTEE

TheSecondNeuroPediaNeuroscience Conference

WHERE EVERYTHING HAPPENS

The Halls

MAIN HALL 1

	The View	Opening · Keynotes · Neurosurgery and Psychiatry orals · Medical Jeopardy · Awards
MAIN HALL 2	Marquise Emerald	Neurology oral sessions 1–3
MAIN HALL 3	Babylon · 1st floor	Registration · Exhibition · Poster presentations
HALL 4	Annex · 1st floor	Workshops 1, 5, 9
HALL 5	VIP · 6th floor	Workshops 2, 6, 10
HALL 6	Akaad · 1st floor	Workshops 3, 7, 11
HALL 7		Workshops 4, 8, 12

07:00 – 12:00

The Morning

07:00 – 09:00	Registration EmeraldHall·badgecollectionand workshop tickets
09:00 – 09:46	Opening Ceremony The View Hall ·HostedbyMohammad Al-Bakri

09:00 – 09:12	**Welcome · Recitation of the Holy Qur'an · National Anthem**
09:12 – 09:16	**NNC 2026 Introductory Video**
09:16 – 09:21	**Prof. Salameh Al-Naimat** Presidentof MutahUniversity
09:21 – 09:26	**Prof. Fadi Sawaqed** Deanofthe FacultyofMedicine, MutahUniversity
09:26 – 09:31	**Dr. Amer Alomari** Conference Chairman·Assistant ProfessorofNeurosurgery,MutahUniversity
09:31 – 09:36	**Dr. Omar Jbarah** Conference Vice Chairmanand NeuroPediaFounder·AssistantProfessorof Neurosurgery, Mutah University
09:36 – 09:41	**Own Al-Abdullat** NeuroPedia JordanPresident · UniversityofJordan
09:41 – 09:46	**Majd Badran** NeuroPedia PalestinePresident · ArabAmericanUniversity
09:50 – 10:00	Coffee Break

10:00 – 11:28 · THE VIEW HALL

Keynote Lectures

Eight minutes each. Eleven invited speakers from Jordan and Palestine.

	TIME	LECTURE AND SPEAKER
01	10:00 – 10:08	Neurosurgery Tale and Medical Liability **Prof. Mohammad Albarbarawi** Jordan University of Science and Technology · Jordan
02	10:08 – 10:16	Healthcare Professionals in Leadership **Prof. Mohammad Alqudah** The Kingdom University of Health Sciences · Jordan
03	10:16 – 10:24	From Neuroscience to Clinical Impact: Advancing Brain Health Through Innovation, Research and Global Collaboration **Prof. Malek Alzaben** Arab American University · Palestine
04	10:24 – 10:32	Merging AI with Ethical Clinical Practice: Building Up Experience, Learning by Doing **Prof. Momen Hadidi** Al-Balqa Applied University · Jordan
05	10:32 – 10:40	Modern Approach to Management of Drug-Resistant Epilepsy **Dr. Ahmad Yassin** Jordan University of Science and Technology · Jordan
06	10:40 – 10:48	Rare Challenging Cases in Neuro-Oncology Surgery **Dr. Mouness Obeidat** King Hussein Cancer Center · Jordan
07	10:48 – 10:56	Epidemiology of Primary Brain Tumour Among Adolescents and Adults in Palestine: A Retrospective Study **Dr. Mohammad Abu Awad** An-Najah National University · Palestine
08	10:56 – 11:04	What Makes a Skilled Neurosurgeon **Dr. Ali Ayyad** University of Jordan · Jordan
09	11:04 – 11:12	The Experience of Studying Abroad as a Paediatric Neurologist **Dr. Amal Abu Libdeh** University of Jordan · Jordan
10	11:12 – 11:20	Latest Updates on Dysphagia and Related Neurological Disorders **Dr. Firas Alfawares** Al-Ahliyya Amman University · Jordan
11	11:20 – 11:28	The Stigma of Psychiatric Disorders **Dr. Mohammad Alsmadi** JordanUniversityofScienceandTechnology · Jordan

11:28 – 11:45	Honouring Distinguished Guests and Sponsors The View Hall
11:45 – 12:00	Exhibition Opening Emerald Hall
	Friday Prayer · Lunch · Poster Presentations · Networking All 25 posters are presented in Emerald Hall

14:00 – 19:00

The Afternoon at a Glance

Three parallel streams: oral presentations in The View and Marquise, twelve workshops across four halls, posters and the exhibition in Emerald throughout.

	14:00 – 15:00	15:00 – 16:00	16:00 – 17:00
THE VIEW Main Hall 1	ORAL SESSION Neurosurgery (1)	ORAL SESSION Neurosurgery (2)	ORAL SESSION Psychiatry, AI & Neuroscience
MARQUISE Main Hall 2	ORAL SESSION Neurology (1)	ORAL SESSION Neurology (2)	ORAL SESSION Neurology (3)
EMERALD Main Hall 3	Poster Presentations&Exhibition 25 POSTERS · ALL AFTERNOON		
BABYLON Hall 4 - 1st floor	WORKSHOP 1 Scientific Writing	WORKSHOP 5 Publishing in Top-Tier Journals	WORKSHOP 9 Use of AI in Clinical Research
ANNEX Hall 5 - 1st floor	WORKSHOP 2 Stroke Code Simulation	WORKSHOP 6 ADHD	WORKSHOP 10 Neuro-Monitoring
VIP Hall 6 - 6th floor	WORKSHOP 3 Shunt Interpretation	WORKSHOP 7 Spine Surgery Instruments	WORKSHOP 11 Microsuturing
AKAAD Hall 7 - 1st floor	WORKSHOP 4 AI Usage for Doctors	WORKSHOP 8 Fundamentals of Suturing Skills	WORKSHOP 12 V-MEDX
17:00 – 18:30	Medical Jeopardy The View Hall · Dr. Waleed Dabbas, Dr. Ethar Hazaimeh and Dr. Nedal Abu Sedra		
18:30 – 19:00	Awards & Closing Ceremony The View Hall		

Each oral session holds seven presentations of eight minutes, followed by a four-minute break. Workshop tickets are issued at the registration desk on the day, first come, first served.

SIX SESSIONS · TWO HALLS

Oral Presentations

Eight minutes per presentation. Every abstract was peer-reviewed before acceptance. A = The View, B = Marquise: A1-1 is the first presentation of the first session in The View; B3-2 is the second presentation of the third session in Marquise.

MAIN HALL 1

The View

14:00 15:00		MODERATORS **Dr. Mohammad Hiasat · Dr. Raed Jabour** Neurosurgery (1) · A1
14:00–14:08	A1-1	Maintaining Oncofunctional Balance Through Awake Craniotomy: A Single - Center Experience Said Lahham · King Hussein Cancer Center
14:08–14:16	A1-2	Safety and Surgical Outcomes of Fluorescein Sodium Use in Vestibular Schwannoma: Experience from 55 Consecutive Cases Feras Elshatarat · Mutah University
14:16–14:24	A1-3	Nidus Obliteration, Latency Hemorrhage, and Complications in Posterior Fossa AVM Radiosurgery: A Meta-Analysis Mina Baaji · University of Jordan
14:24–14:32	A1-4	Breaching the Fortress: A Narrative Review of Implantable Ultrasound Emitters for On-Demand Blood-Brain Barrier Disruption in Glioblastoma Khalil Tayyem · Jordan University of Science and Technology
14:32–14:40	A1-5	Posterior Fossa Syndrome After Telovelar Resection of Pediatric Midline Tumors: Clinical Predictors from a Single-Surgeon Experience — A Retrospective Cohort Study Adam Abdallah · King Hussein Cancer Center
14:40–14:48	A1-6	Hypervascular Vestibular Schwannomas: Tumor Size as the Dominant, but Not Sole, Predictor of Early Facial Nerve Outcome Hussam Alshlouh · Mutah University
14:48–14:56	A1-7	Phase-Transition Pharmaceutics: A Narrative Review of Thermoresponsive Hydrogels for Opioid-Sparing Craniotomies Jeda Abboud · Jordan University of Science and Technology

15:00 16:00		MODERATORS **Dr. Amer Jaradat · Dr. Mahmoud Al-Abdallat** Neurosurgery (2) · A2
15:00–15:08	A2-1	Patient-Related Prognostic Factors for Ventriculoperitoneal Shunt Failure in Pediatric Patients: A Systematic Review and Meta-Analysis Shaker Samawi · Jordan University of Science and Technology
15:08–15:16	A2-2	Perioperative Tranexamic Acid for Intracranial Meningioma Resection: A Systematic Review and Meta-Analysis Ahmad Allahaweh · Jordan University of Science and Technology
15:16–15:24	A2-3	Surgical Management and Prognostic Factors of Intraparenchymal Meningiomas: An Individual Patient Data Meta-Analysis Ruba Hamdallah · University of Jordan
15:24–15:32	A2-4	Global, Regional, SDI- and Sex-Stratified Burden of Brain and Central Nervous

		System Cancer, 1990–2023, with Decomposition and Projections to 2050: GBD 2023 Analysis Ayham Allahaweh · University of Jordan
15:32–15:40	A2-5	Post-Operative Cognitive Dysfunction (POCD) After General Anesthesia in Patients Undergoing Brain Tumor Surgery Ahmad Al Btoosh · Jordan University of Science and Technology
15:40–15:48	A2-6	Subarachnoid Space Reconstruction Versus Direct Syrinx Shunting for Post-Traumatic Syringomyelia: A Systematic Review and Meta-Analysis Hazem Shahatit · University of Jordan
15:48–15:56	A2-7	Risk of Symptomatic Hemorrhage with Antithrombotic Therapy in Cerebral Cavernous Malformations: A Drug-Class-Specific Systematic Review, Meta-Regression, and Network Meta-Analysis Bassel Alrabadi · Jordan University of Science and Technology

16:00 17:00		MODERATORS **Dr. Loay Hussienat · Dr. Qais Al-Sa'di** Psychiatry, AI and Neuroscience · A3
16:00–16:08	A3-1	Musical Massage: An Exploratory Multimodal Approach to Memory and Cognitive-Motor Engagement in Alzheimer's Disease. A Three-Year Clinical Practice Report Jack Garabedian · Dr. Jack Sarkis Center
16:08–16:16	A3-2	Anxiety and Depression are Fundamental in Medical Education Radwan Bani Mostafa · University of Jordan
16:16–16:24	A3-3	Virtual Reality as an Assistive Tool in Neurological Rehabilitation: Effects on Balance, Functional Mobility, Standing, Transfers, and Walking Performance Moayad Yousef · Mutah University
16:24–16:32	A3-4	A Study on the Effect of a Therapeutic Program Based on the Concept of Body Memory on the Symptoms of Herniated Disc and Limb Numbness Ahmed Handam · Ewar International Academy for Training and Development
16:32–16:40	A3-5	A Multimodal Nursing Robot Combining Facial Expression Analysis and Physiological Indicators to Proactively Monitor and Support Patients' Mental Health Aisha Odeh · Al-Zaytoonah University of Jordan
16:40–16:48	A3-6	Speech Motor Planning and Sensorimotor Integration in Childhood Apraxia of Speech: Behavioral Biomarkers and Neural Mechanisms Hala Ismail · Al-Ahliyya Amman University
16:48–16:56	A3-7	The Clinical Effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) Therapy in Mitigating PTSD Symptoms Among a War-Surviving Refugee Family: A Longitudinal Clinical Study Hana' Abuhindi · TheWorldIslamic Sciencesand EducationUniversity

MAIN HALL 2
Marquise

14:00 15:00		MODERATORS **Dr. Omar Alrawashdeh · Dr. Raed Al-Nofal** Neurology (1) · B1
14:00–14:12	INVITED SPEAKER	Immune-Mediated Encephalitis in Pediatrics: A Case-Based Approach

		Mutee Ashahab · Al-Quds University
14:12–14:20	B1-1	Safety and Efficacy of Endovascular Treatment for Pediatric Acute Ischemic Stroke: A Systematic Review and Meta-Analysis Aesha Enairat · Palestine Technical University
14:20–14:28	B1-2	Global, Regional, and Socio-Demographic Disparities in Intracerebral Hemorrhage Burden: Trends from 1990–2023, Sex Stratification, and Projections to 2034 Ahmad Allahaweh · Jordan University of Science and Technology
14:28–14:36	B1-3	Diagnostic Accuracy of Matrix Metalloproteinases for Predicting Hemorrhagic Transformation After Ischemic Stroke: A Systematic Review and Meta-Analysis Ahmad Alkasem · Mutah University
14:36–14:44	B1-4	AIM2 Signaling in Cerebrovascular and Traumatic Brain Injury: A Systematic Review and Meta-Analysis of Preclinical and Clinical Studies Bassel Alrabadi · Jordan University of Science and Technology
14:44–14:52	B1-5	The Subclinical Window for Cardioprotection in Duchenne Muscular Dystrophy: A Systematic Review and Meta-Analysis Feras Shatarat · Mutah University
14:52–15:00	B1-6	Glucagon-Like Peptide-1 Receptor Agonists in Multiple Sclerosis: A Systematic Review and Mechanistic Synthesis Mallak Albataineh · Jordan University of Science and Technology

15:00 16:00		MODERATORS **Dr. Mohammad Athamneh · Dr. Raji Shamaileh** Neurology (2) · B2
15:00–15:08	B2-1	A Meta-Analysis Comparing Phase 2 and 3 Trial Evidence on the Safety and Efficacy of BTK Inhibitors Versus Teriflunomide in Relapsing MS Mazin Magableh · Hashemite University
15:08–15:16	B2-2	Acupuncture for Migraine Compared with Pharmacological and Non-Pharmacological Interventions: A Systematic Review and Network Meta- Analysis of 29 Randomized Controlled Trials Mohammad Kana'an · Jordan University of Science and Technology
15:16–15:24	B2-3	Gut Microbiome and Metabolic Signatures in Early and Prodromal Parkinson's Disease: A Systematic Review and Meta-Analysis of Microbial Diversity Mazn Aljedi · Hashemite University
15:24–15:32	B2-4	GLP-1 Receptor Agonists in Parkinson's Disease: A Systematic Review and Meta-Analysis of Motor Outcomes, Safety, and Potential Disease-Modifying Effects Osama Al-Sa'id · Jordan University of Science and Technology
15:32–15:40	B2-5	Autosomal Recessive Spastic Ataxia of Charlevoix-Saguenay (ARSACS) in a Patient with Initial Vitamin E Deficiency (AVED): A Case Report and Literature Review Raghad Abusirhan · Jordan University of Science and Technology
15:40–15:48	B2-6	A Comprehensive Regional Analysis of Alzheimer's Disease and Other Dementias Across North Africa and the Middle East: Examining Historical Trends, Sex Disparities, and Future Projections Rakan Haddad · University of Jordan
15:48–15:56	B2-7	Congenital Myasthenic Syndromes in Jordanian Children: Neurological Phenotypes, Genotype–Phenotype Variability, and Challenges in Diagnosis and Targeted Therapy Rama Al Bustanji ·Mutah University

16:00 17:00		MODERATORS **Dr. Mohammad Al-Majali · Dr. Mutee Ashahab** Neurology (3) · B3
16:00–16:08	B3-1	Effectsof Melatonin Supplementation on Clinical, Sleep, and Inflammatory Outcomes in Patients with Multiple Sclerosis: A Systematic Review and Meta-Analysis Bassel Alrabadi · Jordan University of Science and Technology
16:08–16:16	B3-2	The Mimicker: Granulomatosis with Polyangiitis Masquerading as Skull Base Osteomyelitis Reine Zankar · American University of Beirut Medical Center
16:16–16:24	B3-3	Expanding the Clinical Spectrum of KID Syndrome: The First Reported Jordanian Case with Neurological and Skeletal Abnormalities Rama Al Bustanji · Mutah University
16:24–16:32	B3-4	Insight into Female Susceptibility to Epstein-Barr Virus–Related Multiple Sclerosis: Examining Sex-Specific Mechanisms Sahar Mohsen · Al-Bashir Hospital
16:32–16:40	B3-5	Global and SDI-Stratified Burden of Multiple Sclerosis, 1990–2023: A Comprehensive Analysis Using the Global Burden of Disease Database Yousef Alhisa · University of Jordan
16:40–16:48	B3-6	Efficacy and Safety of Ibrutinib in Central Nervous System Lymphoma: A Systematic Review and Meta-Analysis Yousef Al Bojoq · Al-Bashir Hospital
16:48–16:56	B3-7	Early Cardiac Manifestations as the Initial Presentation of Duchenne Muscular Dystrophy in Infancy Rahaf Elshatarat · Mutah University

TWELVE HANDS-ON SESSIONS

Workshops

Four workshops run in parallel in each of the three afternoon slots.

	WORKSHOP	HALL	TIME
01	Scientific Writing Dr. Ihda Bani Khalaf	Babylon · Hall 4	14:00 – 15:00
02	Stroke Code Simulation Dr. Qais Sa'di	Annex · Hall 5	14:00 – 15:00
03	Spine Surgery Instruments Mohammad Khalil	VIP · Hall 6 · 6th floor	14:00 – 15:00
04	AI Usage for Doctors Prof. Baker Thneibat	Akaad · Hall 7	14:00 – 15:00
05	Publishing in Top-Tier Journals Dr. Sadeen Sameer Eid	Babylon · Hall 4	15:00 – 16:00
06	ADHD Dr. Mahmoud Bashtawi	Annex · Hall 5	15:00 – 16:00
07	Shunt Interpretation Dr. Adam Abdallah	VIP · Hall 6 · 6th floor	15:00 – 16:00
08	Fundamentals of Suturing Skills Dr. Aya AlTamimi	Akaad · Hall 7	15:00 – 16:00
09	Use of AI in Clinical Research Dr. Mohammad Alhamad	Babylon · Hall 4	16:00 – 17:00
10	Neuro-Monitoring Eng. Yazan Kinani	Annex · Hall 5	16:00 – 17:00
11	Microsuturing Dr. Amer Sawalha	VIP · Hall 6 · 6th floor	16:00 – 17:00

	WORKSHOP	HALL	TIME
12	V-MEDX Dr. Salma Elshiekh	Akaad · Hall 7	16:00 – 17:00

CONFERENCE LEADERSHIP

CONFERENCE CHAIRMAN
Dr. Amer Alomari
Assistant Professor of Neurosurgery · Mutah University

VICE CHAIRMAN & NEUROPEDIA FOUNDER
Dr. Omar Jbarah
Assistant Professor of Neurosurgery · Mutah University

HEAD OF THE SCIENTIFIC COMMITTEE
Dr. Omar Alrawashdeh
Assistant Professor of Neurology · Mutah University

ORGANISING COMMITTEE CHAIR & HOST
Mohammad Al-Bakri
NeuroPedia · Faculty of Medicine, Mutah University

NNC2026@neuropedia.net +96279119 1180 neuropedia.net
#NNC2026

KEYNOTE SPEAKERS:

1- Prof. Mohammad Al-Barbarawi

2- Prof. Mohammad Al Qudah

3- Prof. Malik Zaben

4- Prof. Momen Hadidi

5- Dr. Ahmad Yassin

6- Dr. Mouness Obeidat

7- Dr. Mohammed Abuawad

8- Dr. Ali Ayyad

9- Dr. Amal Abu Libdeh

10- Dr. Firas Al Fawaris

11- Dr. Mohammad Smadi

keynote speakers:

Hall: view hall

Prof. Mohammad Al-Barbarawi



“Neurosurgery Tale and Medical Liability”

- **Consultant Neurosurgeon and Spine Surgeon at KAUH.**
- **Dean of Graduate Studies at JUST**

Prof. Mohammad Al Qudah



“Healthcare Professionals In Leadership“

- **President of Kingdom University of Health Sciences.**
- **Consultant in Histopathology at KAUH**

Prof. Malik Zaben



“From neuroscience to clinical impact”

- **Dean of the Faculty of Medicine at AAUP.**
- **Consultant Neurosurgeon at Ibn Sina Hospital.**

Prof. Momen Hadidi



“Merging AI with Ethical Clinical Practice”

- **Distinguished Expert in Forensic Medicine & Medical Ethics.**
- **Former Director General of the National Institute of Forensic Medicine (1985–2011).**

keynote speakers:

Hall: view hall

Dr. Ahmad Yassin



“Modern Approach To Management Of Drug Resistant Epilepsy “

- **Vice Dean of the Faculty of Medicine at JUST**
- **Associate Professor of Neurology at (KAUH).**

Dr. Mouness Obeidat



“Rare challenging cases in Neuro-Oncology Surgery“

- **Head of Oncological Neurosurgery at (KHCC).**
- **Program Director of the Neuro-Oncology Surgery Fellowship.**

Dr. Mohammed Abuawad



“Epidemiology of primary brain tumors”

- **Dean of the Faculty of Medicine at An-Najah National University, Palestine**
- **PhD in Neuroscience – Sorbonne University, Paris, France.**

Dr. Ali Ayyad



“what makes a skilled neurosurgeon”

- **Consultant Neurosurgeon at Jordan University Hospital.**
- **German and Jordanian Board Certified in Neurosurgery.**

keynote speakers:

Hall: view hall

Dr. Amal Abu Libdeh



“The experience of studying abroad as a pediatric neurologist”

- **Pediatric Neurology Consultant at Jordan University Hospital.**
- **JAPA executive board member**

Dr. Firas Al Fawaris



“Latest Updates on Dysphagia and Related Neurological Disorders“

- **PhD. in Medical Speech Pathology from the University of Cincinnati, USA.**
- **Faculty member in the Department of Rehabilitation Sciences at JUST**

Dr. Mohammad Smadi



“The stigma of psychiatric disorders”

- **Psychiatrist and Addiction Specialist in Jordan.**
- **Master’s degree in Psychiatry.**

WORKSHOPS

1- SCIENTIFIC WRITING WORKSHOP
By: Dr. Ihda Bani Khalaf

2- STROKE CODE STIMULATION AND NIHSS SCORING WORKSHOP
By: Dr. QAIS SA'DI

3- SPINE SURGERY INSTRUMENT WORKSHOP
By: MOHAMMAD KHALIL

4- AI USAGE FOR DOCTORS
By: Dr. BAKR AL-DHUNIBAT

5- PUBLISHING IN TOP-TIER JOURNALS: TIPS, TRICKS, AND STRATEGIES
By: Dr. SADEEN EID

6- ADHD WORKSHOP
By: Dr. MAHMOUD BASHTAW

7- Shunt Interpretation Workshop: How to Deal with a Shunted Patient in the ER
By: Dr. ADAM ABDALLAH

8- FUNDAMENTALS OF SUTURING SKILLS
By: Dr. AYA ALTAMIMI

9- The use of AI in clinical research: legal or not!
By: Dr. MOHAMMAD ALHAMAD

10- NEURO-MONITORING
By: ENG. YAZAN AL KENANI

11- MICRO-SUTURING WORKSHOP
By: Dr. AMER SAWALHA

12- VMEDX WORKSHOP
By: Dr. SALMA ELSHIEKH

WORKSHOPS

Dr. Ihda Bani Khalaf



SCIENTIFIC WRITING WORKSHOP

- Hall: Babylon · Hall 4
- Time: 14:00 – 15:00

Dr. QAIS SA’DI



STROKE CODE STIMULATION

- Hall: Annex · Hall 5
- Time: 14:00 – 15:00

MOHAMMAD KHALIL



SPINE SURGERY INSTRUMENT WORKSHOP

- Hall: VIP · Hall 6 · 6th floor
- Time: 14:00 – 15:00

Dr. BAKR AL-DHUNIBAT



AI USAGE FOR DOCTORS

- Hall: Akaad · Hall 7
- Time: 14:00 – 15:00

WORKSHOPS

Dr. SADEEN EID



PUBLISHING IN TOP-TIER JOURNALS

- **Hall: Babylon · Hall 4**
- **Time: 15:00 – 16:00**

Dr. MAHMOUD BASHTAW



ADHD WORKSHOP

- **Hall: Annex · Hall 5**
- **Time: 15:00 – 16:00**

Dr. ADAM ABDALLAH



Shunt Interpretation Workshop

- **Hall: VIP · Hall 6 · 6th floor**
- **Time: 15:00 – 16:00**

Dr. AYA ALTAMIMI



FUNDAMENTALS OF SUTURING SKILLS

- **Hall: Akaad · Hall 7**
- **Time: 15:00 – 16:00**

WORKSHOPS

Dr. MOHAMMAD ALHAMAD



The use of AI in clinical research

- **Hall: Babylon · Hall 4**
- **Time: 16:00 – 17:00**

ENG. YAZAN AL KENANI



NEURO-MONITORING

- **Hall: Annex · Hall 5**
- **Time: 16:00 – 17:00**

Dr. AMER SAWALHA



MICRO-SUTURING WORKSHOP

- **Hall: VIP · Hall 6 · 6th floor**
- **Time: 16:00 – 17:00**

Dr. SALMA ELSHIEKH



VMEDX WORKSHOP

- **Hall: Akaad · Hall 7**
- **Time: 16:00 – 17:00**

ORAL PRESENTATIONS

RESENTERS:

Neurosurgery

1. Said Lahham · King Hussein Cancer Center
2. Feras Elshatarat · Mutah University
3. Mina Baaji · University of Jordan
4. Khalil Tayyem · Jordan University of Science and Technology)
5. Adam Abdallah · King Hussein Cancer Center
6. Hussam Alshlouh · Mutah University
7. Jeda Abboud · Jordan University of Science and Technology
8. Shaker Samawi · Jordan University of Science and Technology
9. Ahmad Allahaweh · Jordan University of Science and Technology
10. Ruba Hamdallah · University of Jordan
11. Ayham Allahaweh · University of Jordan
12. Ahmad Al Btoosh · Jordan University of Science and Technology
13. Hazem Shahatit · University of Jordan
14. Bassel Alrabadi · Jordan University of Science and Technology

Maintaining Oncofunctional Balance Through Awake Craniotomy: A SingleCenter Experience

Adam Abdallah , Atef Hulliel , Said Latham , Zaid Ayesh , Ahmad Aldmaisy , Mouness Obeidat

King Hussein Cancer Center, Amman, Jordan

Introduction

Eloquent-area tumors require balancing extent of resection against the risk of new neurological deficit; awake craniotomy permits function to be monitored during resection. We report oncological and functional outcomes at a national cancer center.

Methods

Retrospective review of 37 patients undergoing awake craniotomy for eloquent-area lesions between June 2022 and May 2026. All were operated by one neurosurgeon with a dedicated awake team and reviewed at the neuro-oncology tumor board pre- and postoperatively. Extent of resection was taken as recorded. The functional endpoint was a new or worsened deficit, with status at last follow-up. Oncofunctional success was defined as gross-total (GTR) or near-total resection (NTR) without a new or worsened deficit. Fisher's exact and Mann–Whitney U tests were used.

Results

Median age was 37 years (IQR 29–47); 22 (59.5%) were male and 12 (32.4%) had a preoperative deficit. Lesions were peri-Rolandic/SMA in 23, insular in 10 and temporal opercular in 4; 22 (59.5%) were left-sided. Pathology: 24 adult-type diffuse gliomas (19 IDH-mutant), 7 metastases, 6 others. GTR was achieved in 17 (45.9%), NTR in 5 (13.5%) and subtotal resection in 15 (40.5%). Intraoperative events occurred in 13 (35.1%), including 7 seizures (18.9%). A new or worsened deficit occurred in 9 (24.3%); it resolved in 3, persisted in 5 (13.5%), unknown in 1. Six of 12 preoperative deficits resolved. Deficits were no more frequent after GTR/NTR than subtotal resection (6/22 vs 3/15; p=0.71) or with insular location (4/10 vs 5/27; p=0.21), but followed 7 of 13 procedures with an intraoperative event versus 2 of 24 without (p=0.004). Oncofunctional success was achieved in 16 (43.2%); no 30-day mortality occurred.

Conclusion

Awake craniotomy achieved gross or near-total resection in 59.5% of eloquent-area lesions with a persisting deficit in 13.5%, meeting both goals in 43.2%. More extensive resection was not associated with more deficits; only intraoperative events were. The small single-surgeon sample, absent volumetric resection data and standardized functional scores, and non-uniform follow-up limit these inferences.

Safety and Surgical Outcomes of Fluorescein Sodium Use in Vestibular Schwannoma: Experience from 55 Consecutive Cases

Feras Shatarat

Background

Vestibular schwannomas (VSs) are benign tumors of the vestibulocochlear nerve for which surgical resection remains challenging due to the risk of facial and cochlear nerve injury. Fluorescein sodium (FS) has been introduced to enhance intraoperative visualization, but its clinical role in VS surgery is not fully established.

Objective

To assess the safety of FS and its association with extent of resection and postoperative neurological outcomes in VS surgery.

Methods

We retrospectively analyzed 55 consecutive patients undergoing retrosigmoid VS resection with intraoperative FS administration (5 mg/kg). Tumors were graded according to the Koos classification. Fluorescein uptake was categorized as absent, moderate, or high. Extent of resection was confirmed by postoperative magnetic resonance imaging (MRI). Facial nerve function was assessed using the House–Brackmann scale, hearing outcomes were evaluated using standard audiological criteria, and renal safety was assessed by paired serum creatinine measurements.

Results

Higher fluorescein uptake was significantly associated with a greater extent of tumor resection ($p = 0.029$). Facial nerve function improved over long-term follow-up, particularly in patients with moderate and high uptake. Postoperative hearing decline was more frequent in cases with higher uptake and more extensive resections, likely reflecting increased surgical complexity rather than a direct effect of fluorescein. No evidence of nephrotoxicity was observed.

Conclusions

Fluorescein sodium appears to be a safe intraoperative adjunct that enhances visualization during VS surgery. In this descriptive cohort, higher fluorescein uptake was associated with differences in extent of tumor resection and postoperative neurological outcomes. However, given the absence of a non-fluorescein control group, these findings should be interpreted as exploratory and hypothesis-generating rather than evidence of a causal effect of fluorescein on surgical outcomes.

Nidus Obliteration, Latency Hemorrhage, and Complications in Posterior Fossa AVM Radiosurgery: A Meta-Analysis

Omar Alomari, Ayham Allahaweh, Yousef Alhisa, Ahmad Allahahweh, Rakan Haddad, Ruba Hamadallah, Mahmoud Abdallat

University of Health Sciences, Istanbul, School of Medicine, University of Jordan, Faculty of Medicine, Jordan University of Science and Technology, Department of Neurosurgery, University of Jordan."

Background:
Infratentorial arteriovenous malformations (AVMs) carry a disproportionately high risk of hemorrhagic morbidity compared to their supratentorial counterparts. While stereotactic radiosurgery (SRS) is a proven treatment modality, specific outcome estimates for posterior fossa AVMs remain fragmented. This systematic review and meta-analysis evaluates the efficacy and safety of single-session SRS specifically for posterior fossa (cerebellar and brainstem) AVMs.

Methods:
A PRISMA-guided systematic search of PubMed, Scopus, and Web of Science evaluated single-session photon-based SRS for posterior fossa AVMs. Primary endpoints were complete angiographic or volumetric obliteration at 5 and 10 years. Safety included latency- interval hemorrhage and symptomatic radiation-induced changes (RICs). Random-effects meta- analyses used prespecified anatomical subgroup analyses.

Results:
Twelve studies were included, comprising 5 primary clinical cohorts, 1 multimodality cohort, 1 guideline, and 5 case reports. Across the primary meta-analytic cohorts (n = 289), the pooled 5-year complete nidus obliteration rate was 75.4% (95% CI: 70.1%–80.0%) with no statistical heterogeneity (I^2 = 0.0%). The pooled latency-interval hemorrhage rate was low at 5.6% (95% CI: 3.4%–9.1%, I^2 = 15.7%). The overall pooled rate of symptomatic RICs was 6.1% (95% CI: 1.8%–19.4%); however, this exhibited substantial heterogeneity (I^2 = 79.1%). Subgroup analysis demonstrated that brainstem-inclusive cohorts experienced significantly higher RIC rates compared to cerebellar-strict cohorts (14.6% vs. 3.9%, p = 0.0033). Illustrative clinical cases confirmed that SRS reliably resolves secondary cranial nerve compression syndromes (e.g., trigeminal neuralgia, hemifacial spasm) within 15 to 18 months.

Conclusion:
Single-session SRS is a highly effective treatment for posterior fossa AVMs, achieving complete obliteration in approximately three-quarters of patients at five years with low latency-hemorrhage rates. While generally safe, the risk of symptomatic radiation-induced complications is dependent on anatomical location, with brainstem involvement carrying significantly higher morbidity than strictly cerebellar lesions.

Breaching the Fortress: A Narrative Review of Implantable Ultrasound Emitters for On-Demand Blood-Brain Barrier Disruption in Glioblastoma

Khalil Mohammed Tayyem

Faculty of Medicine, Jordan University of Science and Technology, Irbid

Background: Maximal safe resection remains the cornerstone of glioblastoma (GBM)management; however, recurrence is almost inevitable due to infiltrative micro-disease protected by the intact blood-brain barrier (BBB). While external Low-Intensity Pulsed Ultrasound combined with intravenous microbubbles can transiently disrupt the BBB for targeted chemotherapy, the skull severely attenuates these acoustic waves. This review explores a paradigm-shifting bioengineering solution: intraoperative placement of implantable, miniaturized ultrasound emitters for repeated, highly targeted, on-demand BBB disruption directly from within the cranial vault.

Methods: A literature search of PubMed, Scopus, and MEDLINE (2018–2026) identified peer-reviewed clinical studies focusing on "implantable ultrasound devices," "blood- brain barrier disruption," and "high-grade glioma." Literature was critically synthesized evaluating surgical feasibility, device biocompatibility, and localized pharmacokinetic enhancement of systemic chemotherapeutics. As a narrative review of published literature, institutional ethical approval was not required.

Results: Anchoring miniaturized ultrasound transducers into the cranial defect during initial resection is surgically feasible and biomechanically safe, showing no significant increase in postoperative infection or hardware extrusion rates. By bypassing the skull entirely, these implants eliminate acoustic attenuation. Postoperatively, devices are activated via a transcutaneous transponder during routine outpatient chemotherapy Infusions. Synced with circulating microbubbles, implanted emitters generate a precise, localized acoustic field that safely opens endothelial tight junctions for up to 24 hours. Pharmacokinetic data indicates this on-demand technique yields up to a 5-fold increase in the localized parenchymal concentration of large-molecule chemotherapeutics (e.g., paclitaxel, carboplatin) directly at infiltrative margins without increasing systemic toxicity.

Conclusion: The integration of implantable ultrasound emitters redefines the physical limits of GBM management. By transforming the resection bed into an active, bioelectronic therapeutic gateway, neurosurgeons transition from executing a single operative event to facilitating chronic, on-demand neuro-oncological drug delivery. This approach bridges surgical resection with advanced biopharmacokinetics, offering a transformative frontier for extending survival in high-grade gliomas.

Posterior Fossa Syndrome After Telovelar Resection of Pediatric Midline Tumors: Clinical Predictors from a Single-Surgeon Experience — A Retrospective Cohort Study

Adam Abdallah , Deema Qassim , Atef Hulliel , Mohammad Mukahal , Ashjan Alshakkah , Nisreen Amayiri , Mouness Obeidat

Objective

Posterior fossa syndrome (PFS) is a well-recognized complication following resection of posterior fossa tumors,characterized by cerebellar mutism, emotional lability, and motor deficits. Identifying preoperative and intraoperative risk factors associated with PFS remains critical for surgical planning and patient counseling. This study aimed to evaluate the association between tumor characteristics, surgical factors, and the development of PFS.

Material and Methods

A retrospective cohort study was conducted on 51 pediatric patients with midline posterior fossa tumors who underwent resection via the telovelar approach at KHCC. Data on demographics, tumor location, maximum tumor diameter, hydrocephalus status, tumor edema, extent of resection, and dentate nucleus involvement were collected. Associations with PFS were assessed using Pearson's chi-square test, Fisher's exact test, and logistic regression analysis.

Results

PFS was observed in 24 patients (47.1%). The cohort included 25 females (49.0%) and 26 males (51.0%). Hydrocephalus was present in 84.3% of patients, and gross total resection was achieved in 54.9%. Tumor location was significantly associated with PFS ($p = 0.041$). A trend toward higher PFS incidence was observed with dentate nucleus infiltration (75%), though this did not reach statistical significance ($p = 0.087$). Maximum tumor diameter was not significantly associated with PFS on logistic regression (OR = 1.007, $p = 0.698$). No significant associations were found between PFS and gender ($p = 0.668$), hydrocephalus ($p = 0.255$), tumor edema ($p = 0.973$), or extent of resection ($p = 0.663$), although a higher proportion of PFS was observed among patients with hydrocephalus.

Conclusions

Tumor location is a significant predictor of PFS following telovelar resection of pediatric midline tumors, while dentate nucleus infiltration may represent an emerging risk factor warranting further investigation. The single- surgeon, single-approach design minimizes surgical variability, strengthening the assessment of tumor-related predictors. Larger, multicenter prospective studies are needed to validate these associations and refine predictive models.

Hypervascular Vestibular Schwannomas: Tumor Size as the Dominant, but Not Sole, Predictor of Early Facial Nerve Outcome

Hosam Naimat

Background: Hypervascular vestibular schwannomas (VSs) may complicate microsurgical dissection because of brisk bleeding and difficult hemostasis. However, these tumors also tend to be larger, making it difficult to determine whether poorer surgical outcomes reflect vascularity itself or the effect of tumor size.

Objective: To determine whether intraoperative hypervascularity is independently associated with early postoperative facial nerve function and gross-total resection after accounting for maximum tumor diameter.

Methods: We retrospectively analyzed 100 consecutive VS resections performed over 42 months within a single senior-surgeon practice. Twenty-one tumors were classified as hypervascular based on qualitative intraoperative assessment. Maximum tumor diameter on preoperative MRI was analyzed as a continuous variable. Early postoperative House-Brackmann (HB) grade was evaluated using proportional-odds ordinal logistic regression, with hypervascularity, maximum diameter, age, and sex included in the primary model; a secondary explanatory model additionally incorporated extent of resection. Gross-total resection (GTR) was assessed using multivariable binary logistic regression.

Results: Hypervascular tumors were larger than non-hypervascular tumors (mean maximum diameter, 3.12 vs 2.40 cm; P<0.001), had worse unadjusted early HB grades (median, 2 vs 1; P=0.0015), and had a lower GTR rate (23.8% vs 53.2%; Fisher exact P=0.026). In the primary ordinal model, each 1-cm increase in maximum diameter was associated with greater odds of a worse early HB category (adjusted OR, 2.35; 95% CI, 1.35-4.09; P=0.003). The adjusted hypervascularity estimate remained elevated but imprecise (adjusted OR, 2.56; 95% CI, 0.90-7.30; P=0.078). In the GTR model, hypervascularity was not independently associated with GTR (adjusted OR, 0.58; 95% CI, 0.16-2.18; P=0.423), whereas each additional centimeter of tumor diameter was associated with lower odds of GTR (adjusted OR, 0.21; 95% CI, 0.10-0.44; P<0.001). At follow-up beyond 6 months, 97 of 98 patients (99.0%) had HB I-II function.

Conclusions: Hypervascular vestibular schwannomas were larger and had worse unadjusted early facial nerve outcomes and lower GTR rates. After adjustment for continuous tumor diameter, tumor size remained strongly associated with both outcomes, whereas the vascularity estimates moved toward the null and remained imprecise. Adjustment for size materially reduced the crude vascularity associations, but did not rule out an additional size-independent effect of vascularity.

Phase-Transition Pharmaceutics: A Narrative Review of Thermoresponsive Hydrogels for Opioid-Sparing Craniotomies

Jeda Salem Abboud

Faculty of Pharmacy, Jordan University of Science and Technology, Irbid

Background: Craniotomy recovery is notoriously complicated by severe scalp pain, yet systemic opioids are dangerous because they can mask critical neurological warning signs. Traditional local anesthetics are safe, but they wash out of the surgical site within hours. This review explores an accessible biopharmaceutical solution: thermoresponsive hydrogels. By utilizing poloxamer-based formulations, such as Pluronic F-127, a simple liquid spray transforms into a sustained-release, localized pharmacy right inside the surgical wound.

Methods: A comprehensive literature search was conducted synthesizing recent data on phase-transition pharmaceutics and neurosurgical wound infiltration, focusing on hydrogels loaded with targeted analgesics. As a narrative review of existing published literature, institutional ethical approval was not required.

Results: Thermoresponsive hydrogels operate on a highly elegant principle of physical chemistry. At room temperature, the polymer formulation remains a free-flowing liquid, allowing neurosurgeons to easily spray or inject it into the complex layers of the skull and scalp before suturing. The moment this liquid hits the 37°C environment of the human body, it instantly crosslinks into a biodegradable gel scaffold, trapping the drugs at the exact site of injury. Over the next 72 hours, the gel slowly dissolves, providing a sustained, zero-order release of ropivacaine (chosen for its lower cardiotoxicity profile) combined with ketorolac to simultaneously target both neuropathic and inflammatory pain pathways. Evidence shows this localized approach nearly eliminates the need for post-operative opioids, bypasses systemic toxicity, and provides continuous pain control without interfering with wound healing.

Conclusion: By turning a liquid anesthetic into a localized, sustained-release gel through body heat, phase-transition hydrogels solve a major surgical problem. This formulation strategy offers a highly practical, opioid-sparing approach to neurosurgical recovery that keeps the medication exactly where it is needed.

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Patient-Related Prognostic Factors for Ventriculoperitoneal Shunt Failure in Pediatric Patients: A Systematic Review and Meta-Analysis

Shaker Samawi, Areen Melhem, Maryam Younes, Saja Alghbary,

Neuropedia research fellowship

Background: In children with hydrocephalus, ventriculoperitoneal (VP) shunt failure is linked to high revision, and evidence on shunt failure predictors remains inconsistent. This study aimed to identify and quantify patient-related prognostic factors associated with VP shunt failure requiring surgical revision in children.

Methods: We performed a systematic review and meta-analysis of cohort and case-control studies with ≥20 patients. PubMed and Scopus were searched to September 2026; studies published from 2007 onward were eligible. We included children aged ≤19 years treated with a VP shunt; the outcome was shunt failure requiring surgery. Hazard ratios (HR) and odds ratios (OR) were pooled separately using random-effects models (DerSimonian–Laird); other factors were synthesized narratively. Risk of bias was assessed using QUIPS.

Results: We included 37 studies. Younger age at shunt insertion was associated with shunt failure (HR 1.79, 95% CI 1.47–2.18; 6 studies; OR 2.09, 95% CI 1.57–2.79; 5 studies); adjusted-only HR (1.69, 95% CI 1.33–2.14; 4 studies) and leave-one-out estimates remained significant. Post-hemorrhagic hydrocephalus secondary to intraventricular hemorrhage (PHH/IVH) was associated with higher odds of failure (OR 2.13, 95% CI 1.67–2.71; 8 studies), with similar results using adjusted (OR 2.54, 95% CI 2.10–3.07; 3 studies) or reported estimates only (OR 2.58, 95% CI 2.14–3.11; 4 studies). Myelomeningocele showed a modest association with hazard of failure (HR 1.30, 95% CI 1.07–1.58; 3 studies) that was sensitive to leave-one-out analysis, but not with odds of failure (OR 1.16, 95% CI 0.74–1.80; 4 studies). Tumour-related hydrocephalus, male sex and public insurance showed no clear association, though several estimates were imprecise.

Conclusion: Younger age at shunt insertion and PHH/IVH were most consistently associated with VP shunt failure; evidence for myelomeningocele was inconsistent. These factors may help identify children who need closer monitoring, and standardized prospective studies are needed.

Keywords: Hydrocephalus; Ventriculoperitoneal Shunt; Cerebrospinal Fluid Shunts; Equipment Failure; Reoperation; Prognosis; Infant; Child; Meta-Analysis; Drainage; Humans

Perioperative Tranexamic Acid for Intracranial Meningioma Resection: A Systematic Review and Meta-Analysis

Ahmad Allahaweh, Omar Alomari, Ayham Allahaweh, Yousef Alhisa, Rakan Haddad, Ruba Hamadallah, Mina Baaji

Faculty of Medicine, Jordan University of Science and Technology, Department of Neurosurgery, Göztepe Medical Park Hospital, Bahçeşehir University School of Medicine, School of Medicine, University of Jordan

Background: While tranexamic acid (TXA) is increasingly utilized to mitigate substantial intraoperative hemorrhage during intracranial meningioma resection, recent large randomized trials have yielded conflicting results. We conducted a comprehensive systematic review and meta-analysis to evaluate the efficacy and safety of perioperative TXA in patients undergoing meningioma surgery.

Methods: Five electronic databases were systematically searched from inception to July 2026 for randomized controlled trials (RCTs) comparing TXA administration against placebo or standard care in meningioma resection. Continuous and dichotomous outcomes were pooled using random-effects models as mean differences (MD) and risk ratios (RR), respectively. Meta-regression and sensitivity analyses were performed to explore sources of statistical heterogeneity.

Results: Nine RCTs comprising 1,234 patients (654 TXA, 580 placebo) were included in the quantitative synthesis. TXA administration significantly reduced intraoperative blood loss (MD = -224.84 mL, 95% CI [-346.45, -103.24], P = 0.0003), though marked heterogeneity was observed (I^2 = 94.8%). Meta-regression revealed this blood loss reduction diminished significantly with increasing patient age (P = 0.018). TXA also significantly decreased the length of hospital stay (MD = -0.98 days, P = 0.04) and overall complication rates (RR = 0.54, P = 0.04). There were no statistically significant differences in operative duration, overall transfusion requirements, or mortality. Importantly, TXA did not increase the risk of adverse neurological or vascular events, including overall thromboembolism (RR = 1.09, P = 0.69), deep vein thrombosis, pulmonary embolism, or postoperative seizures (RR = 1.25, P = 0.44).

Conclusion: TXA represents a safe and effective blood conservation strategy during intracranial meningioma resection. It significantly reduces intraoperative blood loss, hospital length of stay, and overall complications without elevating thromboembolic or seizure risks. The age-dependent efficacy of TXA highlights the necessity for tailored patient selection and optimized perioperative protocols in neurosurgical practice.

Neurosurgery 10 **Surgical Management and Prognostic Factors of Intraparenchymal Meningiomas: An Individual Patient Data Meta-Analysis**

Omar Alomari, Ayham Allahaweh, Yousef Alhisa, Ahmad Allahahweh, Rakan Haddad, Mina Baaji

University of Health Sciences, Istanbul, School of Medicine, University of Jordan, Faculty of Medicine, Jordan University of Science and Technology.,

Background: Intraparenchymal meningiomas are exceptionally rare, entirely intra-axial neoplasms lacking any dural attachment. Because they rely exclusively on parasitized pial or deep cerebral vascular supply, they are nearly universally misdiagnosed preoperatively as high-grade gliomas, solitary metastases, or primitive neuroectodermal tumors. This Individual Patient Data (IPD) meta-analysis characterizes the clinical, pathological, and surgical determinants of this unique entity.

Methods: An IPD meta-analysis was conducted aggregating 65 rigorously documented cases from five decades of neurosurgical literature. Patient-level data encompassing demographic profiles, neuroimaging features, extent of resection (EOR), World Health Organization (WHO) biological grading, immunohistochemistry, and longitudinal recurrence kinetics were systematically synthesized and analyzed.

Results: The cohort demonstrated a distinct pediatric and young adult skew, with male predominance in meningioangiomatosis-associated variants. Lesions were classified as WHO Grade I (61.5%), Grade II (23.1%), and Grade III (15.4%). Immunohistochemical panels (EMA+, SSTR2a+, GFAP-) were critical for definitively ruling out glial mimics. Preoperative endovascular embolization was uniformly non-feasible due to absent dural blood supply. Gross total resection (GTR) was achieved in 66.2% of cases, yielding a 92.3% postoperative seizure freedom rate. Subtotal resection (STR) (27.7%) was primarily dictated by dense tumor encasement of major arterial trunks, such as the middle cerebral or lenticulostriate arteries. Longitudinal time-to-event analysis revealed that completely resected WHO Grade I lesions yield >95% long-term disease-free survival. Conversely, STR remnants and WHO Grade III variants (Ki-67 >10–15%) exhibited rapid local recurrence and progression within 2 to 12 months, mandating immediate adjuvant radiotherapy.

Conclusion: Despite radiologically mimicking malignant intra-axial tumors, most intraparenchymal meningiomas are benign. While deep vascular encasement presents formidable technical challenges, maximal safe microsurgical resection provides an excellent long-term prognosis. Incomplete resections and high-grade variants demand prompt adjuvant radiotherapy to halt rapid recurrence.

Global, Regional, SDI- and Sex-Stratified Burden of Brain and Central Nervous System Cancer, 1990–2023, with Decomposition and Projections to 2050: GBD 2023 Analysis

Ayham Allahaweh, Ahmad Allahaweh, Yousef Alhisa, Rakan Haddad, Ruba Hamadallah, Mina Baaji

School of Medicine, University of Jordan, Faculty of Medicine, Jordan University of Science and Technology.,

Background: Brain and central nervous system (CNS) cancers cause substantial mortality and disability, yet recent estimates separating demographic from epidemiological drivers are limited. We assessed global, socio-demographic index (SDI)-stratified, super-regional and sex-specific trends in CNS cancer burden (1990–2023), decomposed the change, and projected to 2050.

Methods: Secondary analysis of Global Burden of Disease (GBD) 2023: age-standardized rates (per 100,000) of incidence, deaths and disability-adjusted life years (DALYs) for 1990–2023 globally and by SDI quintile, super-region, country and sex. The estimated annual percentage change (EAPC) quantified trends; the DALY change was decomposed (Das Gupta) across seven locations; burden was projected to 2050 (time-series models).

Results: The age-standardized DALY rate fell from 128.05 to 108.01 per 100,000 (EAPC −0.58%/yr) and mortality from 3.17 to 2.98 (EAPC −0.22%/yr); incidence was stable (4.29 to 4.41; EAPC +0.03%/yr, p=0.104). Declines concentrated in High/High-middle SDI (DALY EAPC −0.68 and −0.90%/yr); Middle SDI rose in all measures (DALYs +0.45, deaths +0.76, incidence +0.93%/yr; p<0.001). Central Asia rose most (DALYs +1.17, incidence +1.42%/yr), East Asia fell most (DALYs −1.36%/yr); High-income Asia Pacific, fastest-rising incidence (+1.77%/yr). Females fell faster than males (DALY EAPC −0.67 vs. −0.51; deaths −0.31 vs. −0.15%/yr). Absolute DALYs rose from 6.43 to 9.16 million (growth +120.6%, aging +34.7%, offset by epidemiological improvement −55.3%), with epidemiological worsening in Southeast Asia (+9.1%), Central Asia (+40.2%) and High-income Asia Pacific (+77.1%). Projections to 2050 show stable-to-rising burden, greatest in High-income Asia Pacific.

Conclusion: Between 1990 and 2023, the global age-standardized burden of brain and CNS cancer declined only modestly, largely confined to high-SDI regions; the absolute burden still rose with population growth and ageing, while the underlying epidemiological component worsened in several Asian and middle-SDI settings. Sharper female declines and pronounced heterogeneity indicate a need for region-specific prevention, timely diagnosis and expanded neuro-oncology capacity, particularly across Central/Southeast Asia and middle-SDI countries.

Post-Operative Cognitive Dysfunction (POCD) After General Anesthesia in Patients Undergoing Brain Tumor Surgery

Ahmad Al Btoosh, Abdulaziz Ali

Jordan University of Science and Technology

Background:

Postoperative Cognitive Dysfunction (POCD) is a clinically important complication following major surgery under general anesthesia, involving impairments in :

◆ Memory

◆ Attention

◆ And executive functions

Patients undergoing primary brain tumor surgery may be particularly vulnerable due to pre-existing neurological impairment :

◆ Tumor-related tissue damage

◆ Cerebral edema

However, the influence of different anesthetic techniques on postoperative cognitive recovery in neurosurgical patients and the potential role of occupational therapy in postoperative neurorehabilitation. Objective

To investigate the immediate and short-term cognitive effects of general anesthesia in patients undergoing primary brain tumor resection, comparing Total Intravenous Anesthesia (TIVA) using propofol with inhalational anesthesia using sevoflurane. This study will also examine the influence of tumor malignancy on cognitive decline and the relationship between cognitive recovery and functional independence , emphasizing the potential role of occupational therapy in supporting daily functioning.

Methods

A prospective, observational, comparative cohort study will include 80 adults undergoing elective primary brain tumor surgery, allocated into two groups of 40 according to the anesthetic technique selected by the attending anesthesiologist. Cognitive and functional outcomes will be assessed preoperatively, on postoperative days 3-5, and at one-month follow-up using the Montreal Cognitive Assessment (MoCA), Mini-Mental State Examination (MMSE), and Karnofsky Performance Status (KPS). Repeated Measures ANOVA will assess changes over time and the effects of anesthetic technique and tumor classification.

Conclusion

This study aims to clarify the relationship between anesthetic technique, tumor characteristics, POCD, and functional recovery. Integrating cognitive and functional outcomes emphasizes the importance of interdisciplinary care involving :

◆ Neuro-anesthesia

◆ Neurosurgery

◆ And occupational therapy, with early cognitive rehabilitation, ADL training, and environmental adaptations, with the goal of improving independence and reducing caregiver dependency.

Subarachnoid Space Reconstruction Versus Direct Syrinx Shunting for PostTraumatic Syringomyelia: A Systematic Review and Meta-Analysis

Hazem Shahatit, Omar Alomari, Ayham Allahaweh, Ahmad Allahaweh, Yousef Alhisa, Rakan Haddad, Ruba Hamadallah, Mina Baaji

Faculty of Medicine, Jordan University of Science and Technology, Department of Neurosurgery, Göztepe Medical Park Hospital, Bahçeşehir University School of Medicine, School of Medicine, University of Jordan

Background: Posttraumatic syringomyelia (PTS) is a progressive complication of spinal cord injury driven by arachnoid adhesions and altered cerebrospinal fluid dynamics. Surgical management involves either subarachnoid space reconstruction or direct cyst shunting. This meta-analysis evaluates the comparative efficacy and reoperation risks of reconstruction versus distinct shunting routes.

Methods: A systematic review and meta-analysis of 23 clinical series (1984–2024) comprising 420 PTS patients was conducted following PRISMA guidelines. Statistical pooling via fixed-effects and DerSimonian-Laird random-effects models compared subarachnoid reconstruction against direct shunting, with subgroup analyses specifically evaluating syringoperitoneal (SP), syringosubarachnoid (SS), and syringopleural (SPl) routes. Primary endpoints included clinical neurological improvement and reoperation rates.

Results: Subarachnoid reconstruction (n=92) yielded a 72.1% pooled clinical improvement rate, compared to 55.7% for all direct shunting (n=328). Head-to-head analysis demonstrated that reconstruction provided a 4.5-fold higher odds of clinical improvement (OR = 4.551, p < 0.0001) and a significantly reduced reoperation risk (OR = 0.314, p = 0.0002). Subgroup analysis of individual shunt routes revealed that SP shunts achieved the highest clinical improvement (68.2%) among drainage options but required frequent revision (31.7%) for distal occlusion and migration. SS shunts demonstrated lower clinical improvement (58.4%) and a 21.5% revision rate, failing frequently in the presence of diffuse arachnoiditis. SPl shunts yielded the poorest improvement (48.5%) and the highest reoperation risk (38.2%), driven by unique complications such as pleural effusions and overdrainage.

Conclusion: Subarachnoid space reconstruction addresses the root pathophysiology of PTS and represents the most clinically effective and durable first-line surgical intervention. Direct syrinx shunting carries unacceptably high long-term failure rates; however, when extensive arachnoiditis renders untethering unfeasible, SP shunts offer the best adjunctive symptomatic relief despite requiring vigilant hardware surveillance. SS shunts should be strictly reserved for localized cavities with completely patent surrounding subarachnoid spaces.

Risk of Symptomatic Hemorrhage with Antithrombotic Therapy in Cerebral Cavernous Malformations: A Drug-Class-Specific Systematic Review, MetaRegression, and Network Meta-Analysis

Omar Alomari, Bassel Alrabadi, Omar M. Nashwan, Kelly D. Flemming

Department of Neurosurgery, Göztepe Medical Park Hospital, Bahçeşehir University School of Medicine, Istanbul, Türkiye; Türkiye Brain Foundation, Istanbul Neuroscience Institute, Türkiye, Jordan University of Science and Technology, Irbid, Jordan, Department of Neurology, Mayo Clinic, Rochester, Minnesota, USA

Background: The safety of antithrombotic therapy (ATT) in cerebral cavernous malformations (CCMs) remains debated given concerns regarding intracranial hemorrhage. We evaluated specific ATT regimens on symptomatic hemorrhage (SH) at initial presentation and during prospective follow-up.

Methods: Following PRISMA and PRISMA-NMA guidelines (PROSPERO: CRD420261498507), five databases were systematically searched through July 2026. Pairwise random-effects meta-analyses, network meta-analyses (NMA), and meta-regressions examining antiplatelet (AP), anticoagulant (AC), and combination therapies were performed in R (version 4.5).

Results: Sixteen studies were included. In the prospective NMA (12 cohorts, n = 5,986; mean follow-up 4.3 years [2.3-7.8]), arms included controls (n=3,884), AP monotherapy (n = 1,073), AC monotherapy (n = 758), and combination therapy (n=271). Overall ATT was associated with reduced odds of presenting SH (OR 0.43, 95% CI 0.28 to 0.64) and prospective SH (OR 0.24, 95% CI 0.11-0.54). In pairwise pooling, AP monotherapy significantly reduced prospective SH (OR 0.22, 95% CI 0.09-0.53), whereas AC monotherapy exhibited neutral risk (OR 0.54, 95% CI 0.18-1.60). In NMA, AP monotherapy ranked safest (P-score =0.974; OR 0.25, 95% CI 0.11-0.56 vs controls) and was superior to combination therapy (OR 0.16, 95% CI 0.03 to 0.82). AC monotherapy ranked second (P-score=0.591); combination therapy ranked lowest (P-score=0.139). Meta-regression revealed no effect modification by age, sex, multiplicity, or brainstem location (all p>0.05).

Conclusion: ATT, particularly antiplatelet monotherapy, does not increase SH risk in CCM and associates with reduced prospective hemorrhage regardless of lesion location or demographics. Anticoagulants exhibit neutral risk, while combination therapy warrants clinical caution.

Musical Massage: An Exploratory Multimodal Approach to Memory and Cognitive-Motor Engagement in Alzheimer's Disease. A Three-Year Clinical Practice Report

Jack Sarkis Center, Noor AlTaji

Dr Jack Sarkis Center

Background

Alzheimer's disease can affect memory, language, communication, motor coordination, and functional movement. In addition to the emotional support, therapies that concurrently activate cognitive, sensory, and motor processes may help activate preserved neural pathways. This study explored the potential effects of Musical Massage, an original therapeutic method developed by the researcher, combining structured musical and rhythmic stimulation with tactile stimulation to facilitate cognitive and functional engagement in individuals with Alzheimer's disease.

Methods

Four older adults with Alzheimer's disease (two males and two females) participated in a three-year observational intervention. Along with massage and tactile stimulation of the extremities and body, Musical Massage blended musical rhythms and selected compositions from various genres. Singing and familiar musical themes were used to help recall, linguistic synthesis, communication, and goal-directed movement. Data were collected through direct observation, continuous monitoring of participants' responses, and information provided by family members. A dynamic evaluation approach was used to assess changes over time, including the progression, consistency, and persistence of observed responses.

Results

Across the observation period, participants demonstrated recurrent responses to Musical Massage and rhythmic stimulation. Observed changes included improved engagement in purposeful movement, greater gait steadiness, increased participation in conversation, and enhanced recall of familiar information when music or singing was used as a cue. Singing appeared particularly useful in facilitating verbal expression and access to previously familiar language patterns. The responses demonstrated varying degrees of consistency and persistence across participants.

Conclusion

These preliminary observations suggest that Musical Massage may engage multiple functional domains associated with memory, language, movement, and emotional processing. By integrating auditory rhythm, music, singing, and tactile stimulation, this original multimodal approach may provide a framework for engaging preserved functional pathways in individuals with Alzheimer's disease. Further controlled studies with larger samples and standardized outcome measures are warranted.

Anxiety and Depression are Fundamental in Medical Education

Radwan Bani Mustafa

University of Jordan, Amman, Jordan

- Anxiety and depression share most of their symptomatology. They overlap, and more or less, share the same treatments.
- Anxiety and depression main presentation are physical symptoms involving all body systems, this is why they should be every medical graduate concern not only psychiatrists.
- About 50% of primary care/general hospital outpatients have anxiety/depression as the main cause for the consultation or contributory to it.
- Depression is currently the 1st disability causing health problem in all age groups.
- The annual cost of treatment of physical disease co-morbid with depression is 2–3 times more than if there is no co-morbidity.
- The mortality rate in acute MI is tripled (15%) over 6 months if patient develop depression just as much as if the MI is complicated by left ventricular failure.
- About 40% of patients suffering from chronic physical disease will develop depression.

Virtual Reality as an Assistive Tool in Neurological Rehabilitation: Effects on Balance, Functional Mobility, Standing, Transfers, and Walking Performance

Moayad Yousef

Objective

To describe the experience of integrating mobile phone-based virtual reality (VR) technology into neurological rehabilitation programs for four patient groups and to monitor clinical observations related to motor and functional performance.

Methodology

The study included 40 patients divided equally into four groups, with 10 patients in each group: multiple sclerosis (MS), spinal cord injury (SCI), cerebral palsy (CP), and stroke/cerebrovascular accident (CVA). All patients received a conventional rehabilitation program combined with the use of a mobile phone-based virtual reality headset, which involved watching videos and engaging in virtual games. The VR headset was used for 10–15 minutes per session, three sessions per week, for approximately 20 sessions per patient. Patient responses were assessed through clinical observation and documentation of changes.

Results

The researcher reported positive clinical observations, including noticeable improvements in standing balance, functional transfers, and certain aspects of walking, stopping, and changing direction. The provided data did not include standardized test scores or quantitative measurements that would allow for the calculation of effect sizes or statistical significance. Therefore, the findings remain descriptive and exploratory, highlighting the need for future studies using standardized assessment tools and comparison groups.

Conclusion

Mobile phone-based virtual reality may serve as an adjunctive tool to encourage patient engagement in conventional neurological rehabilitation programs.

A Study on the Effect of a Therapeutic Program Based on the Concept of Body Memory on the Symptoms of Herniated Disc and Limb Numbness

Afaf Audeh

Background

Herniated disc is a common musculoskeletal disorder that may be associated with pain, limb numbness, sensory disturbances, and reduced functional capacity. This study aims to investigate the potential effects of a therapeutic program based on the proposed concept of Body Memory, by evaluating changes in symptoms associated with herniated disc and limb numbness.

Methods

A quasi-experimental research design will be used to assess changes associated with the therapeutic intervention. Participants diagnosed with herniated disc and experiencing related symptoms will undergo a therapeutic program based on the proposed principles of the Body Memory concept. Clinical assessments will be conducted before and after the intervention. The primary outcome measures will include pain intensity, severity of limb numbness, and functional performance. Appropriate statistical methods will be applied to compare pre- and post-intervention measurements and estimate the magnitude of the observed changes.

Expected Results

The study is expected to determine whether the proposed therapeutic program is associated with measurable changes in pain intensity, limb numbness, and functional performance. Statistical analysis will be used to determine the statistical significance and effect size of the observed changes.

Conclusion

This study aims to provide a preliminary and systematic evaluation of a therapeutic program based on the Body Memory concept among individuals with herniated disc accompanied by limb numbness. The findings may provide preliminary data regarding the potential applicability of this approach and help determine the need for more rigorous future research, including controlled clinical trials, larger sample sizes, and longer follow-up periods.

A Multimodal Nursing Robot Combining Facial Expression Analysis and Physiological Indicators to Proactively Monitor and Support Patients' Mental Health

Aisha Mousa Odeh, Jane Basel Albahnasi , Sadeen Anwar ALKatoot, Mazen Demtri Quttaineh, Ahmed Feras Alhawawsheh

Background

Artificial intelligence (AI) technologies are increasingly being investigated as innovative tools to promote mental well-being and expand access to mental health support. The integration of facial-expression analysis with physiological monitoring may offer a non-invasive and continuous means of identifying early changes in individuals' mood states. Aim: This study aimed to develop and preliminarily evaluate an AI-powered nursing robot designed to monitor and support mental health. The robot combined facial-expression analysis with selected physiological vital signs to detect potential changes in users' emotional states. The study also examined participants' acceptance of the robot as a supportive technology for mental health monitoring and care

Methods

A one-group pretest–posttest quasi-experimental design was used among 30 participants. Acceptance was evaluated across several dimensions, including perceived AI robot advantages, perceived usefulness (PU), perceived ease of use (PEOU), trust, privacy concerns, social influence, facilitating conditions, perceived mental health stigma, perceived competence of AI, and intention to use. Results: The intervention was associated with an overall improvement in participants' acceptance of AI robots for mental well-being. Perceived usefulness increased substantially, with the mean score for enhancing the ability to manage mental health concerns increasing from 3.37 ± 1.377 before the intervention to 3.93 ± 0.944 after the intervention. Similarly, the perceived usefulness of AI robots for improving mental well-being increased from 3.03 ± 1.450 to 3.87 ± 0.819.

Conclusion

The intervention helped increase people's acceptance of AI robots as tools for supporting mental well-being. This improvement was reflected in their perceptions of the robots' usefulness and ease of use, as well as greater trust, confidence in their abilities, awareness of the available support, and willingness to use them. Keywords: Artificial intelligence; AI robot; mental well- being; technology acceptance; perceived usefulness; perceived ease of use; trust; mental health; nursing; digital health.

Speech Motor Planning and Sensorimotor Integration in Childhood Apraxia of Speech: Behavioral Biomarkers and Neural Mechanisms

hala Khaliel

Al Mahara Center for Speech

Background

Childhood Apraxia of Speech (CAS) is a neurogenic pediatric speech sound disorder characterized by impaired planning and programming of movement sequences, in the absence of neuromuscular deficits. Contemporary neurophysiological evidence implicates distributed sensorimotor networks, specifically pre-Rolandic motor regions, the postcentral gyrus, supplementary motor areas, and the frontal aslant tract. This study examines how disruptions in these cortical networks may manifest as dynamic articulatory breakdowns.

Methods

A quasi-experimental pretest-posttest case series design was utilized to evaluate 11 participants. Dynamic motor-speech assessments were conducted before and after training to evaluate speech performance across increasing syllabic and coarticulatory complexities, probing the integrity of motor planning networks. We specifically evaluated the mechanisms of proprioceptive cueing, which stimulates oral and facial sensory receptors. This sensory input is transmitted via the trigeminal nerve to the brainstem and relayed to the primary somatosensory cortex.

Results

Prior to training, the participants exhibited prominent speech motor difficulties, characterized by recurrent vowel distortions, disrupted coarticulatory transitions, and inconsistent errors. These articulatory breakdowns indicate a potential difficulty in maintaining stable motor plans. Following training, external proprioceptive cueing appeared to facilitate speech motor output. Interim results based on the duration of the intervention revealed that a subgroup of 4 participants who began the program earlier achieved 100% word clarity. Meanwhile, the remaining 7 participants reached 50% word clarity, as their training programs are not yet completed. The motor cortex may integrate this structured sensory feedback to refine motor commands, suggesting a role for coordination between the precentral and postcentral gyri.

Conclusion

Given the small sample size, the behavioral profile of CAS provides encouraging preliminary evidence supporting a motor-network disruption rather than a purely phonological deficit. Modulating the sensorimotor feedback loop through repeated sensory-motor interaction may strengthen neural pathways, potentially promoting accurate speech production. These findings establish a clinical-neuroscience foundation for future investigations into speech motor learning using neurophysiological methods, such as Transcranial Magnetic Stimulation (TMS).

The Clinical Effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) Therapy in Mitigating PTSD Symptoms Among a War-Surviving Refugee Family: A Longitudinal Clinical Study

HANA' ABDEL WAHAB HASSAN ABUHINDI

Background

War trauma and forced displacement severely destabilize family systems, commonly presenting as Post-Traumatic Stress Disorder (PTSD) that compromises sleep architecture, emotional stability, and family interpersonal dynamics.

Objective

To evaluate the clinical effectiveness of EMDR therapy in reducing PTSD symptoms and restoring psychosocial functioning in a displaced war-surviving nuclear family.

Methodology & Assessment Tools

A qualitative longitudinal clinical case study design was employed with a refugee family of four members (N = 4). Baseline and post-intervention evaluations were conducted using semi-structured diagnostic clinical interviews and direct behavioral observations aligned with DSM-5 criteria across its four core symptom clusters (intrusions, avoidance, negative alterations in cognitions/mood, and hyperarousal). Participants completed a targeted EMDR therapy protocol, followed by structured clinical and telephonic follow-up monitoring to track the stability of therapeutic gains.

Results

Post-intervention clinical evaluations and follow-up data revealed substantial qualitative and functional recovery across all participants. A marked reduction was observed across all four DSM-5 PTSD symptom clusters. Crucially, direct clinical observations and follow-up reports highlighted a significant restoration of sleep patterns (marked decrease in nightmares and insomnia) alongside the re-establishment of positive emotional communication and social functioning within the family system.

Conclusion

EMDR demonstrates high clinical utility and adaptability as a field-responsive intervention for alleviating war-related trauma symptoms and promoting sustainable psychosocial recovery among refugee families in crisis settings.

Safety and Efficacy of Endovascular Treatment for Pediatric Acute Ischemic Stroke: A Systematic Review and Meta-Analysis

Hesham Kelani, Mohamed A. Elzayat, Hazem Mohamed Salamah, Ahmed Samir, Munzer Naima, Aesha L. E. Enairat, Mohammad Hamad, Joshua Singavarapu, Masoom J. Desai, Ahmed Abd Elazim, Volodymyr Vulkanov, Diana Greene-Chandos, David Rosenbaum-Halevi, David P. Lerner, Lisa R. Merlin, Eytan Raz

SUNY Downstate Health Sciences University at One Brooklyn Health, USA, Mansoura University, Egypt Zagazig University, Egypt, Cairo University, Egypt, University of Aleppo, Syria, Al-Quds University, Palestine: Al-Andalus University for Medical Sciences, Syria, University of Jordan, SUNY Downstate Health Sciences University, USA, University of New Mexico, USA, University of South Dakota Sanford Medical Center, USA, Rutgers New Jersey School of Medicine, USA, Saint Louis University School of Medicine, USA, SUNY Downstate Health Sciences University at One Brooklyn Health, USA, SUNY Downstate Health Sciences University at One Brooklyn Health, USA, SUNY Downstate Health Sciences University, USA, NYU Langone, USA

This meta-analysis aimed at evaluating the safety and efficacy of mechanical thrombectomy (MT) compared to the best medical management (BMM) in children after acute ischemic stroke. We conducted a systematic search of the literature through January 2025. Review Manager Software was used to calculate the odds ratios and their confidence intervals. The primary outcomes of interest were excellent functional recovery (modified Rankin Scale score ≤ 1 (PedmRS 0–1) at 90 days), symptomatic intracranial haemorrhage (sICH), and mortality. A total of eight studies encompassing 8048 patients were included. We found no statistically significant difference between the MT group and the BMM group in terms of mortality (OR 1.17, 95% CI [0.45, 3.05], p-value = 0.75, I2 = 0%), sICH (OR 1.32, 95% CI [0.40, 4.39], p-value = 0.6, I2 = 0%) and PedmRS 0–1 (OR 1.31, 95% CI [0.68, 2.53], p-value = 0.41, I2 = 43%). Furthermore, we performed a subgroup analysis of patients with large vessel occlusion (LVO) stroke and did not find any statistically significant difference between MT and BMM groups in terms of mortality (OR 3.48, 95% CI [0.42, 28.76], p-value = 0.25, I2 = 0%), sICH (1.09, 95% CI [0.26, 4.47], p-value = 0.90, I2 = 0%) and PedmRS 0–1 (OR 3.62, 95% CI [0.78, 16.76], p-value = 0.10, I2 = 59%). However, the BMM group showed increased odds of having a poor functional recovery (PedmRS 3–6) (OR 0.37, 95% CI [0.19, 0.73], p-value = 0.004, I2 = 0%). Our findings suggest that both MT and BMM have comparable safety and efficacy outcomes in the pediatric population. Further studies with more strict inclusion criteria are needed to confirm these findings.

Global, Regional, and Socio-Demographic Disparities in Intracerebral Hemorrhage Burden: Trends from 1990–2023, Sex Stratification, and Projections to 2034

Ahmad Allahaweh, Ayham Allahaweh, Yousef Alhisa, Rakan Haddad, Ruba Hamadallah, Mina Baaji, Hazem Shahatit, Jawad Allahaweh

Faculty of Medicine, Jordan University of Science and Technology, Faculty of Medicine, The University of Jordan

Background

Intracerebral hemorrhage (ICH) remains a leading cause of stroke-related death and disability worldwide, yet recent global assessments extend only to 2021 and offer limited insight into differences by sex and socio-demographic development. We characterised global and socio-demographic index (SDI)-stratified, sex-specific trends in ICH burden from 1990 to 2023 and projected trends to 2035.

Method

We analysed the Global Burden of Disease (GBD) 2023 database, extracting age- standardized rates (per 100,000) of incidence, prevalence, deaths, and disability-adjusted life years (DALYs) globally and for the five SDI quintiles, by sex, for 1990–2023. Temporal trends were quantified using the estimated annual percentage change (EAPC) from log-linear regression, and burden through 2035 was projected by log-linear extrapolation.

Result

Globally, age-standardized ICH burden declined across all four measures between 1990 and 2023: deaths fell from 69.41 to 34.90 per 100,000 (−49.7%; EAPC −2.27%/yr), DALYs from 1,685.47 to 867.55 (−48.5%; EAPC −2.16%/yr), incidence from 62.49 to 43.60 (−30.2%; EAPC −1.50%/yr), and prevalence from 252.64 to 198.59 (−21.4%; EAPC −0.74%/yr). Mortality declines were steepest in High-middle and High SDI regions (−65.7% and −60.8%) and slowest in Low-middle SDI (−19.1%). Females showed steeper declines than males across all outcomes and SDI groups (global mortality EAPC −2.52 vs. −2.06%/yr). Low-middle SDI males were the only subgroup with a rising trend, in prevalence (+1.3%; EAPC +0.08%/yr). Projections to 2035 indicate continued global decline with a persisting gap between higher- and lower-SDI regions.

Conclusion

The global age-standardized burden of ICH has fallen substantially, driven largely by high- and high-middle-SDI regions. However, marked socio-demographic inequities persist: lower-SDI settings have improved far less, and rising prevalence among Low-middle SDI males signals a shift from an acute, fatal disease toward a chronic burden. Targeted investment in hypertension detection and management and in stroke surveillance in low-resource settings is urgently needed.

Diagnostic Accuracy of Matrix Metalloproteinases for Predicting Hemorrhagic Transformation After Ischemic Stroke: A Systematic Review and Meta-Analysis

Anas Elgenidi, Bassel Alrabadi, Ahmad Alkasem, Esraa Mohammed, Elsayed Kshk

Department of Neurology, Mayo Clinic, Jacksonville, Florida., Jordan University of Science and Technology, Irbid, Jordan, School of Medicine, Mutah University, Karak, Jordan, Faculty of Medicine, Minia University, Minya, Egypt, Cardiology Department, Damanhour Teaching Hospital, Egypt.

Background

Hemorrhagic transformation (HT) is a serious complication of acute ischemic stroke (AIS), occurring in 10–40% of cases and worsening disability and mortality. Matrix metalloproteinases (MMPs), particularly MMP-9, mediate blood–brain barrier disruption and neuroinflammation, making them promising biomarkers for early HT prediction. This systematic review and meta-analysis evaluated the diagnostic accuracy of MMPs in predicting HT after AIS.

Methods

We systematically searched PubMed, Scopus, Web of Science, Cochrane Library, and Embase up to January 2025. Two reviewers independently extracted data and assessed quality using the Newcastle-Ottawa Scale and NIH tools. Continuous outcomes were analyzed using mean difference (MD) with 95% CIs; diagnostic accuracy was assessed using bivariate random-effects modeling (Meta-DiSc). Heterogeneity was evaluated using the χ^2 test and I^2 statistic. The study was registered in PROSPERO (CRD420251115685).

Results

Nine studies comprising 1,051 participants (274 HT, 777 non-HT) were included. MMP-9 levels were significantly higher in the HT group (pooled MD 70.51 ng/mL; 95% CI 35.47–105.5), though with high heterogeneity (I^2 = 93%). Diagnostic accuracy meta-analysis (8 studies) showed pooled sensitivity of 0.79 (95% CI 0.79–0.84), specificity of 0.796 (95% CI 0.67–0.88), positive likelihood ratio 3.88 (95% CI 2.35–6.40), negative likelihood ratio 0.26 (95% CI 0.20–0.35), and diagnostic odds ratio 14.75 (95% CI 7.62–28.58). No heterogeneity was observed (I^2 = 0), and no publication bias was detected.

Conclusion

Elevated MMP-9 is strongly associated with HT after AIS and demonstrates good diagnostic accuracy. These findings support MMP-9 as a promising biomarker for early risk stratification, though standardization of sampling timing and cutoff thresholds is needed before clinical integration.

AIM2 Signaling in Cerebrovascular and Traumatic Brain Injury: A Systematic Review and Meta-Analysis of Preclinical and Clinical Studies

Bassel Alrabadi, Omar Alomari, Yousef Alghzawi, Natalie Bandak , Farah Suliman Marji, Ayham Allahaweh, Hasan Matar, Sama Almasri, Christina Hanania, Jamir Pitton Rissardo , Laith Maali

Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan, Hamidiye International Faculty of Medicine, University of Health Sciences, Uskudar, Istanbul, Turkey, Faculty of Medicine, University of Jordan, Amman, Jordan, Department of Neurology, Washington University School of Medicine in St. Louis, St. Louis, MO, USA, Department of Neurology, University of Wisconsin School of Medicine and Public Health, Madison, WI, USA, Neurology Department, Cooper University Hospital, Camden, NJ, USA, Department of Neurology, The University of Kansas Health System, Kansas City, Kansas, USA

Background: Absent in melanoma 2 (AIM2) is a cytosolic DNA sensor that promotes inflammasome activation, neuroinflammation, and pyroptotic cell death following acute brain injury. This systematic review and meta-analysis evaluated the role and therapeutic potential of AIM2 signaling in cerebrovascular diseases and traumatic brain injury (TBI).

Methods: PubMed, Scopus, Web of Science, and Cochrane Library were searched from inception to March 2026. Preclinical and clinical studies investigating AIM2 expression, activation, or inhibition in cerebrovascular injury and TBI were included.

Results: Thirty-nine studies met the inclusion criteria, including 32 preclinical and 7 clinical studies. Brain injury was associated with significant upregulation of AIM2 protein (SMD = 3.06, 95% CI: 2.07–4.05; I^2 = 74%) and mRNA expression (SMD = 3.09, 95% CI: 1.70–4.48; I^2 = 66%). AIM2 inhibition significantly reduced infarct volume (SMD = −2.30, 95% CI: −3.25 to −1.34; I^2 = 86%), neurological deficits (SMD = −3.16, 95% CI: −5.22 to −1.10; I^2 = 95%), brain edema (SMD = −2.53, 95% CI: −4.13 to −0.93; I^2 = 84%), IL- 1β levels (SMD = −2.17, 95% CI: −2.98 to −1.35; I^2 = 68%), and caspase-1 expression (SMD = −2.35, 95% CI: −3.16 to −1.53; I^2 = 58%). Clinical studies consistently reported elevated AIM2 levels after stroke and TBI.

Conclusions: AIM2 signaling is a central mediator of neuroinflammation and secondary injury following cerebrovascular and traumatic brain injury. Current evidence supports AIM2 as a promising prognostic biomarker and therapeutic target, although further translational and clinical studies are needed to establish its therapeutic potential.

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Glucagon-Like Peptide-1 Receptor Agonists in Multiple Sclerosis: A Systematic Review and Mechanistic Synthesis

Mohammad Emad Sami Albataineh

Jordan university of science and technology

Background: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs), used for obesity and type 2 diabetes, show anti-inflammatory, antioxidant, and neuroprotective effects in preclinical multiple sclerosis (MS) models, yet human evidence remains fragmented.
Objective: To systematically review and mechanistically synthesize human evidence on GLP-1 RAs in MS across disability, immune, radiological, neurodegenerative, and safety domains.

Methods: A PRISMA 2020-compliant search of PubMed/MEDLINE, Scopus, Web of Science, Cochrane CENTRAL, ClinicalTrials.gov, and conference sources identified six eligible studies: three single-arm or pre/post retrospective cohorts (n=49–131), one prospective non-randomized controlled cohort (n=25), one propensity-matched cohort (14,092 patients), and one FAERS pharmacovigilance analysis. Given heterogeneous designs and non-overlapping outcomes, findings were narratively synthesized rather than pooled; risk of bias was assessed using the Newcastle-Ottawa Scale and NIH Quality Assessment Tools.

Results: GLP-1 RAs were well tolerated, with gastrointestinal effects predominating and no consistent signal of increased relapse or radiological activity. Weight loss was reported across single-arm cohorts but not replicated in the sole controlled trial. Disability outcomes were generally stable, though the largest propensity-matched analysis reported reduced five-year functional-system progression versus untreated controls, contrasting a smaller cohort finding no EDSS benefit. Preliminary data suggested preserved endothelial function and improved antioxidant capacity relative to controls, and pharmacovigilance data showed an inverse reporting association between GLP-1 RA exposure and MS. Immune-cell, neurofilament, and volumetric MRI data were absent.

Conclusions: Existing evidence supports short-to-medium-term safety of GLP-1 RAs in MS, with encouraging but inconsistent disability and mechanistic signals, underscoring the need for prospective controlled trials with standardized outcomes.
Keywords: multiple sclerosis; GLP-1 receptor agonists; systematic review; neuroprotection; disease-modifying therapy

A Meta-Analysis Comparing Phase 2 and 3 Trial Evidence on the Safety and Efficacy of BTK Inhibitors Versus Teriflunomide in Relapsing MS

Mazin Magableh, Abdel Rahman khasawneh, Jehad Alyaqoub, Tareq Alibrahim, Layth Al-Ramahi, Dana sultan, rua alhamaideh, lyan alkhaldi

Background: Multiple sclerosis is a relapsing-remitting disease of central nervous system demyelination. Bruton's tyrosine kinase inhibitors are emerging therapies being studied for relapsing multiple sclerosis. Their comparative efficacy and safety have not been studied in comparison to known therapies. This systematic review and network meta-analysis compares BTK inhibitors with teriflunomide in adults with RMS.

Methods: The following databases were searched from inception until October 2025: PubMed, Embase, Cochrane, Scopus, and ClinicalTrials.gov. We included randomized phase 2/3 trials evaluating evobrutinib, fenebrutinib, or tolebrutinib against placebo or teriflunomide. The primary efficacy outcome we analyzed was annualized relapse rate (ARR). Secondary outcomes evaluated were confirmed disability progression (CDP), MRI activity, and safety. Risk of bias was assessed using RoB 2. Random-effects network meta-analysis was performed using risk ratios or hazard ratios with 95% confidence intervals.

Results: A total of nine trials with 6,926 participants were included. Evobrutinib (RR 0.65, 95% CI 0.50–0.84), teriflunomide (RR 0.66, 95% CI 0.56–0.77), and tolebrutinib (RR 0.68, 95% CI 0.53–0.87) had a statistically significant reduction in ARR in comparison to placebo, with no clear difference between treatment arms. For T1 gadolinium-enhancing lesions, teriflunomide showed lower lesion rates than evobrutinib (RR 1.54, 95% CI 1.28–1.84) and tolebrutinib (RR 1.96, 95% CI 1.56–2.50). For new or enlarging T2 lesions, evobrutinib showed fewer lesions than tolebrutinib (RR 0.79, 95% CI 0.64–0.98), whereas comparisons between tolebrutinib and teriflunomide were not statistically clear. Tolebrutinib had lower CDP hazards than teriflunomide at 12 weeks (HR 0.73, 95% CI 0.57–0.94) and 24 weeks (HR 0.71, 95% CI 0.53–0.95). The safety analyses showed no clear differences in most outcomes. Risk of bias was assessed to be low for ARR and safety outcomes; however, concerns were greater for CDP.

Conclusion: BTK inhibitors reduced both relapse and MRI activity versus placebo, but the network did not show a statistically significant ARR difference between any BTK inhibitor and teriflunomide. MRI and disability findings varied by endpoint. There were no overall safety differences across treatments. More long-term head-to-head trials with more mature data are needed to clarify comparative benefits.

Acupuncture for Migraine Compared with Pharmacological and NonPharmacological Interventions: A Systematic Review and Network MetaAnalysis of 29 Randomized Controlled Trials

Mohammad Qasim Naser Kana'an

Background:
Migraine is a highly prevalent and disabling neurological disorder. Although acupuncture is increasingly used as a preventive treatment, its comparative effectiveness and safety relative to pharmacological and non-pharmacological interventions remain uncertain. We aimed to evaluate the comparative efficacy and safety of acupuncture for migraine using a systematic review and network meta-analysis.

Methods:
We searched PubMed, Scopus, and Web of Science from inception to June 2026 for randomized controlled trials (RCTs) evaluating acupuncture for migraine. Eligible trials compared active acupuncture with pharmacological treatment, sham acupuncture, or waiting-list/no-treatment controls. Outcomes included migraine frequency, monthly migraine days, headache intensity and duration, disability, migraine-specific quality of life, depressive symptoms, and adverse events. Risk of bias was assessed using the Cochrane Risk of Bias 2 tool. A frequentist random-effects network meta-analysis was conducted using a graph-theoretical approach, with heterogeneity and network consistency assessed where applicable.

Results:
Twenty-nine RCTs involving 4,217 participants were included. Thirteen trials (44.8%) had low overall risk of bias, four (13.8%) had some concerns, and 12 (41.4%) had high risk of bias. Acupuncture reduced monthly migraine days compared with waiting-list controls (MD, −2.35; 95% CI, −3.62 to −1.08) and sham acupuncture (MD, −0.97; 95% CI, −1.74 to −0.20), whereas the difference versus pharmacological treatment was not statistically significant (MD, −0.84; 95% CI, −1.68 to 0.01). Acupuncture also reduced migraine intensity compared with pharmacological treatment (SMD, −0.33; 95% CI, −0.53 to −0.12) and waiting-list controls (SMD, −0.92; 95% CI, −1.25 to −0.58). For monthly migraine frequency, acupuncture was superior to pharmacological treatment but not sham acupuncture. Attack duration was shorter with acupuncture than pharmacological treatment, whereas the difference versus waiting-list was not significant. VAS scores favored acupuncture over waiting-list controls. Migraine-specific quality-of-life outcomes consistently favored acupuncture over sham and waiting-list controls. Acupuncture was associated with fewer adverse events than pharmacological treatment (RR, 0.35; 95% CI, 0.25–0.48), with no significant difference versus sham acupuncture or standard therapy. Substantial heterogeneity and/or network inconsistency were observed for several outcomes.

Conclusion:
Acupuncture may provide clinically relevant benefits for migraine, particularly in reducing monthly migraine days and headache intensity and improving migraine-specific quality of life, while demonstrating a favorable tolerability profile.

Gut Microbiome and Metabolic Signatures in Early and Prodromal Parkinson's Disease: A Systematic Review and Meta-Analysis of Microbial Diversity

Rema' Aljedi, Barjes Alziara, Yazan Alzyoud, Zaina Alomari , Leen Al Qalqili , Shazan Aljedy

Background:
Growing evidence suggests that gut microbiome alterations occur during the earliest stages of Parkinson's disease (PD). However,findings remain inconsistent because of differences in disease stage, medication exposure, sequencing methods, sample processing, and outcome reporting. This systematic review and meta-analysis evaluated gut microbial diversity, taxonomic composition, fecal short-chain fatty acids (SCFAs), and metabolomic findings in early and prodromal PD.

Methods:
PubMed, Embase, Web of Science, and Scopus were systematically searched. Following study selection,30 primary reports were included.Data were extracted, cleaned, standardized, and assessed for duplicate or overlapping cohorts.Populations with prodromal, early, newly diagnosed, untreated, treated, cognitively impaired, and established PD were analyzed separately where appropriate. Alpha-diversity indices were evaluated individually, whereas beta diversity, taxonomic findings, SCFAs, and metabolomic findings were summarized narratively.Random-effects meta-analysis was performed only when comparable numerical data were available from at least two independent cohorts.

Results:
The 30 included reports represented 4,429 participant records, although overlapping cohorts prevented estimation of the total number of unique participants. Only the Shannon, Simpson, and Chao1 indices were eligible for meta-analysis, each based on two independent cohorts comprising 245 participants. No significant differences were observed between PD and healthy controls for the Shannon index (mean difference [MD] −0.067, 95% confidence interval [CI] −1.501 to 1.366; I^2=77.8%), Simpson index (MD −0.021, 95% CI −0.185 to 0.144; I^2=53.2%), or Chao1 richness (MD 1.904, 95% CI −25.119 to 28.926; I^2=43.3%). Beta-diversity findings could not be pooled because of methodological and reporting heterogeneity. SCFA meta-analysis was not feasible because of inconsistent measurement units, missing variance estimates, unclear wet- versus dry-weight reporting, and incomplete numerical data. Across studies,Faecalibacterium and Prevotella were generally less abundant, whereas Akkermansia and Desulfovibrio tended to be more abundant.

Conclusions:
Early and prodromal PD may be associated with recurring alterations in gut microbial composition, but pooled evidence does not demonstrate consistent differences in alpha diversity.Interpretation is limited by the small number of independent cohorts, cohort overlap, methodological heterogeneity, and incomplete quantitative reporting, particularly for SCFAs.Standardized study design, and outcome reporting are needed to support more reliable future meta-analyses.

GLP-1 Receptor Agonists in Parkinson's Disease: A Systematic Review and Meta-Analysis of Motor Outcomes, Safety, and Potential Disease-Modifying Effects

Rama AlSayyed, Omar jamous, Raad Issa, Aya Aladam, Tala Naser, Rawan Alnqla, Sara Bahaadeen, Shahd Nofal, Tala Abu Alam, Osama Al-sa'id

Hashemite University, Jordan

Neurosurgery department, AlBashir Hospital

Al-Azhar University, Palestine

Jordan University of Science and Technology, Jordan

Background: GLP-1 receptor agonists (GLP-1 RAs) show neuroprotective, anti-inflammatory, and disease-modifying potential in neurodegenerative disorders, offering a promising therapeutic. avenue for Parkinson's disease (PD)

Objective: To systematically review and meta-analyze the clinical efficacy, safety, and disease-modifying potential of GLP-1 RAs compared to placebo in patients with PD.

Methods: Following PRISMA guidelines, we searched PubMed, Scopus, Web of Science, and the Cochrane Library for randomized controlled trials (RCTs) comparing GLP-1 RAs to placebo in PD. The primary outcome was motor symptom changes assessed by the MDS-UPDRS Part III. Secondary outcomes included cognitive function, non-motor symptoms, quality of life, and safety profiles. Risk of bias was evaluated using the Cochrane RoB 2 tool.

Results: Five RCTs (n = 730 participants) evaluating exenatide, lixisenatide, liraglutide, and NLY01 were included. Meta-analysis showed a pooled mean difference of -1.45 (95% CI: -3.21 to 0.31; p = 0.11) under the random-effects model, indicating no statistically significant overall motor benefit when combining all trials, with moderate heterogeneity (I^2= 47.0%). However, the largest and longest trial (Exenatide-PD3, 96 weeks) showed no benefit. GLP-1 RAs significantly increased risks of nausea (OR: 4.82, 95% CI: 3.35-6.95) and vomiting (OR: 5.01, 95% CI: 2.62-9.60). Three studies had a low risk of bias; two raised some concerns.

Conclusion: GLP-1 RAs target neurodegenerative mechanisms in preclinical models, but current clinical trial evidence does not support routine clinical use or a definitive disease-modifying effect in Parkinson's disease. Larger, long-term trials are required to establish whether any sustained efficacy exists.

Autosomal Recessive Spastic Ataxia of Charlevoix-Saguenay (ARSACS) in a Patient with Initial Vitamin E Deficiency (AVED): A Case Report and Literature Review

Raghad Abusirhan , Abdallah shehadeh, Duha Alshorofat, Kefah alhayek, Walaa A kamel, Salma Bashayreh

Jordan University of Science and Technology

Background: ARSACS is characterized by progressive cerebellar ataxia, peripheral neuropathy, and pyramidal signs. It is caused by mutations in the SACS gene on chromosome 13q12 and was originally reported in Québec, Canada. Ataxia with Vitamin E deficiency (AVED) is another autosomal recessive ataxia, typically presenting with progressive ataxia, areflexia, and peripheral neuropathy, associated with low serum vitamin E and usually caused by TTPA mutations. We describe the first Jordanian case of ARSACS initially diagnosed as AVED.

Method: Case report.

Results: A 48-year-old man developed progressive bilateral lower-limb numbness and weakness at age 22, followed two years later by impaired fine motor skills and worsening balance. His parents were consanguineous, with no affected relatives. Examination showed overshooting saccades, ataxic dysarthria, impaired rapid alternating movements and finger-nose-finger testing, bilateral lower-limb weakness (4/5), spasticity, brisk knee reflexes (+3), reduced ankle reflexes (+1), impaired vibration sense, pes cavus, and hammer toes. Ophthalmological examination was normal. Nerve conduction studies initially showed demyelinating sensorimotor polyneuropathy, later demonstrating axonal changes. Brain MRI showed T2/FLAIR hyperintensity and thickening of the middle cerebellar peduncles. Vitamin E was 0.77 (reference range 3.8–18.4). Lipid profile, vitamin B12, copper, celiac antibodies, thyroid function, VDRL, echocardiogram, and whole- spine MRI were unremarkable. WES identified a homozygous likely pathogenic missense mutation, c.13658C>T (p.Thr4553Ile), in SACS. Vitamin E 800 IU twice daily produced no improvement.

Conclusion: Although AVED is confirmed by TTPA mutation, diagnostic criteria remain unsettled. In patients with low vitamin E and no treatment response, other causes of autosomal recessive ataxia should be considered, particularly when the phenotype and radiological findings are atypical. This case emphasizes the importance of genetic testing in patients with unexplained progressive ataxia and severe vitamin E deficiency and supports accurate diagnosis and genetic counseling.

Congenital Myasthenic Syndromes in Jordanian Children: Neurological Phenotypes, Genotype–Phenotype Variability, and Challenges in Diagnosis and Targeted Therapy

Rama Al bustanji, yara abukhaled

Faculty of medicine, Mutah University, Al karak, Jordan

Khalifa University College of Medicine and Health Sciences,Abu Dhabi,UAE

Background: Congenital myasthenic syndromes (CMS) are rare inherited neuromuscular-junction disorders with marked genetic and phenotypic heterogeneity. Diagnosis is frequently delayed, particularly in consanguineous populations, despite the availability of genotype-directed therapies. We report a Jordanian pediatric series highlighting diagnostic challenges, intrafamilial variability, and treatment implications.

Methods: We retrospectively reviewed five Jordanian children evaluated for suspected CMS or inherited neuromuscular disease. Clinical phenotype, family history, laboratory, electrophysiologic and biopsy findings, genetic results, treatment, and functional outcomes were assessed.

Results: Three children had genetically confirmed CMS. Patient 1, a 5-year-old boy with homozygous *CHRNE* frameshift mutation, presented with early feeding difficulty, progressive fatigable weakness, ptosis, ophthalmoplegia, falls, and nocturnal cyanotic/apneic episodes. Despite hyperreflexia, pyridostigmine produced dramatic clinical improvement with complete resolution of apnea and restoration of independent ambulation. Patients 2 and 3, siblings aged 5 and 3.5 years, carried the same homozygous *DOK7* frameshift mutation but showed markedly different severity. The older sibling had delayed motor development, falls, ptosis, proximal weakness, and Gower sign, whereas the younger had mild proximal weakness. Salbutamol produced substantial functional improvement in both, with age-appropriate motor function achieved after early treatment in the younger sibling. Patients 4 and 5 had atypical multisystem disease and uncertain neuromuscular significance of genetic findings, illustrating the complexity of variant interpretation and differential diagnosis during CMS evaluation.

Conclusion: This series demonstrates substantial genotype–phenotype variability, including striking intrafamilial differences, and emphasizes that atypical neurological findings should not exclude CMS. Early molecular diagnosis can prevent prolonged diagnostic uncertainty, guide subtype-specific treatment, and facilitate cascade screening. In consanguineous populations such as Jordan, improving access to genetic testing and longitudinal genotype–phenotype registries may substantially improve recognition, management, and counseling of children with suspected CMS.

Effects of Melatonin Supplementation on Clinical, Sleep, and Inflammatory Outcomes in Patients with Multiple Sclerosis: A Systematic Review and MetaAnalysis

Bassel Alrabadi, Omar Alomari, Hasan I. Matar, Natalie Bandak, Shahd S. Abdelwahab, Yamen Refai, Yousef Alghzawi, Ahmed Z. Obeidat, Russel J. Reiter

Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan

Hamidiye International Faculty of Medicine, University of Health Sciences, Uskudar, Istanbul, Turkey

Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan

Department of Neurology, Medical College of Wisconsin, Milwaukee, WI, USA

Department of Cell Systems & Anatomy, Long School of Medicine, UT Health San Antonio, San Antonio, TX, USA

Background: Multiple sclerosis (MS) is a chronic immune-mediated disorder of the central nervous system characterized by neuroinflammation and axonal injury. Patients frequently experience sleep disturbances and fatigue, which are linked to dysregulated cytokine signaling. Melatonin, a neurohormone with immunomodulatory and neuroprotective properties, has emerged as a potential adjunctive therapy. This systematic review and meta-analysis evaluate the efficacy and safety of melatonin in patients with MS.

Methods: Following PRISMA guidelines and PROSPERO registration (CRD420261322550), we searched PubMed, Scopus, and the Cochrane Library for studies published between January 2013 and December 2025. Eligible studies investigated melatonin administration in MS patients, reporting clinical, radiological, or biochemical outcomes. Quantitative synthesis was limited to parallel-group RCTs. Crossover and non-randomized studies were excluded from pooling. Risk of bias was assessed using RoB2 and ROBINS-I, and certainty was assessed using GRADE.

Results: Nineteen reports were included. Quantitative synthesis was restricted to parallel-group RCTs. Pooled analyses showed lower TNF-α levels (MD = −8.51, 95% CI −10.39 to −6.63; P < 0.001), no significant difference in IL-1β (MD = −426.09, 95% CI −1292.17 to 439.99; P = 0.33), and no significant difference in EDSS (MD = 0.01, 95% CI −0.19 to 0.20; P = 0.92). and certain cognitive domains, while effects on disability progression (EDSS) and MRI lesion burden remained inconsistent. Melatonin was well tolerated with no serious adverse events.

Conclusion: Current randomized evidence is limited and does not show a clear effect on disability or inflammatory biomarkers. While it may enhance functional and cognitive outcomes, its impact on systemic inflammatory markers and long-term disability progression requires further validation through high-quality, large-scale randomized controlled trials.

The Mimicker: Granulomatosis with Polyangiitis Masquerading as Skull Base Osteomyelitis

Background: Granulomatosis with polyangiitis (GPA) can present with multiple cranial neuropathies and mimic infectious skull base osteomyelitis (SBO) or nasopharyngeal malignancy. Reported skull base GPA cases with cranial neuropathies are mostly ANCA-seronegative and diagnosed by biopsy. We describe the reverse pattern.

Methods: Single-patient case report with longitudinal review of clinical, serological, microbiological, CSF, neuroimaging (CT, gadolinium MRI), FDG-PET and histological data across multidisciplinary care, compared with previously published skull base GPA cases. Written consent of the patient was obtained.

Results: A man in his 40s with asthma and recurrent sinusitis developed left facial palsy and hearing loss, then mastoiditis refractory to mastoidectomy, followed by progressive left CN VII–X palsies (dysphagia, dysphonia, vocal cord paralysis) and bilateral scleritis/episcleritis. MRI showed enhancing skull base, parapharyngeal and nasopharyngeal soft-tissue thickening with dural thickening; PET showed FDG-avid nasopharyngeal thickening and a pulmonary nodule. CSF showed mild lymphocytic pleocytosis without clonal B cells. Ear cultures grew ESBL-producing *Escherichia coli* and non-albicans *Candida*, but the wider infectious work-up was negative. PR3-ANCA was strongly positive (>200 U/mL), yet nasopharyngeal biopsy showed only inflammation, fibrosis and eosinophilia, without vasculitis. After multidisciplinary exclusion of infection and malignancy, GPA was diagnosed clinically. Glucocorticoids and azathioprine (rituximab deferred because of infection risk) improved inflammatory markers and ocular and cutaneous disease; cranial nerve recovery remains uncertain.

Conclusion: Progressive lower cranial neuropathies with skull base enhancement and dural thickening should prompt early, parallel evaluation for ANCA-associated vasculitis, even when imaging suggests SBO. Strongly positive PR3-ANCA can support the diagnosis despite a non-diagnostic biopsy, and true co-infection may coexist. Serology, histology and imaging are complementary, and multidisciplinary care is essential to avoid irreversible neurological injury.

Expanding the Clinical Spectrum of KID Syndrome: The First Reported Jordanian Case with Neurological and Skeletal Abnormalities

Dr. Rama Al-Bustanji, Dr. Bayan Rababah, Miral S. Aburumman, Nizar Al-Rabadi, Yara Abukhaled, Dr. Hamzeh Bany Younis, Gharam Ghalyon, Dr. Safaa Al-Tawalbeh, Dr. Osama Aloudat, Dr. Anas Satari

Introduction:
Keratitis-Ichthyosis-Deafness syndrome is a rare ectodermal disorder caused by pathogenic mutations in the *Gap Junction Beta-2* gene, which encodes the gap junction protein connexin 26. While the condition is traditionally defined by a triad of keratitis, ichthyosis, and sensorineural hearing loss, emerging evidence suggests that connexin 26 dysfunction may lead to broader systemic involvement. This case highlights a rare presentation with neurological and musculoskeletal abnormalities.

Patient Concerns:
A three-year-old female born at 31 weeks of gestation presented with a history of global developmental delay, recurrent seizures, photophobia, and thick hyperkeratotic skin changes. At birth, she was encased in a collodion membrane and exhibited bilateral eyelid malposition. Her development was marked by delayed milestones, joint stiffness, and poor weight gain.

Diagnosis:
Clinical findings included vascularizing keratitis, lamellar ichthyosis, and right-sided sensorineural hearing loss confirmed by auditory brainstem response testing. Brain imaging revealed moderate enlargement of the cerebral ventricles. Skeletal surveys demonstrated developmental dysplasia of the hip and congenital muscular torticollis. Based on the constellation of cutaneous, auditory, neurological, and musculoskeletal abnormalities, a clinical diagnosis of Keratitis-Ichthyosis-Deafness syndrome was made, likely due to a connexin 26 mutation. Genetic testing was unavailable.

Interventions:
The patient received coordinated multidisciplinary care. Dermatologic management involved intensive emollient therapy. Ophthalmologic intervention included ocular lubricants and surgical correction of eyelid malposition. Antiepileptic medication was initiated for seizure control. The musculoskeletal team provided physical therapy to address joint contractures and improve motor function.

Outcomes:
Following early intervention, dermatologic symptoms stabilized, seizure activity diminished, and gradual impreratitis-Ichthyosis-Deafness syndrome by documenting uncommon manifestations including seizures, ventriculomegaly, torticollis, and hip dysplasia. It emphasizes the importance of considering this diagnosis in neonates with ectodermal abnormalities, even in the absence of confirmatory genetic testing. Early recognition and multidisciplinary intervention areovements in physical function were observed. However, developmental delay and structural brain abnormalities persisted, requiring long-term follow-up and therapy. Parental compliance and ongoing multidisciplinary involvement were critical in optimizing care.

Conclusion:
This case expands the clinical spectrum of K essential for improving long-term functional and developmental outcomes.

Insight into Female Susceptibility to Epstein-Barr Virus–Related Multiple Sclerosis: Examining Sex-Specific Mechanisms

Laila Masarwah, Sara Al-Hatabeh, Bayan Abdulraheem, Manal Hammash, Haya Al-Hatabeh, Hala Alkiswani

Background: Multiple sclerosis is a chronic central nervous system disease that causes inflammation and damages the protective covering of nerves, leading to neurological problems. It is more common in women than in men. The Epstein-Barr Virus (EBV) has been connected to MS. However, it is still not clear why women are more likely to develop EBV-related MS. Studies suggest that hormones, genetics, and sex-specific differences in the immune system influence EBV persistence in the body and affect immunity.

Objective: To review the biological reasons why women may be more likely to develop EBV-related MS, focusing on sex hormones like prolactin and on immune responses that differ between men and women to explain the higher risk in women.

Methods: We searched PubMed, ScienceDirect, and other databases for studies about EBV, MS, and why women might be more at risk. We selected 15 review articles and summarized their main findings on hormonal, immune, genetic, and viral factors.

Results:

Hormonal pathways: Prolactin, estrogen, and progesterone influence how long EBV remains in the body, support B-cell survival, and alter immune system function. Immune mechanisms: Women have stronger anti-EBV antibody responses and greater B-cell sensitivity, which may increase the risk of autoimmune diseases. Genetic pathways: Genes on the X chromosome and other sex-specific factors influence how the immune system responds. EBV-host interactions: When EBV remains in B-cells and communication between B-cells and T-cells changes, this can cause inflammation and damage the protective covering of nerves in the central nervous system.

Conclusion: Women are more likely to develop EBV-related MS due to hormone effects, genetic factors, stronger immune responses, EBV persistence, and interactions between B-cells and T-cells. More research is needed to understand how these factors combine to cause disease in women

Global and SDI-Stratified Burden of Multiple Sclerosis, 1990–2023: A Comprehensive Analysis Using the Global Burden of Disease Database

Yousef Alhisa, Ayham Allahaweh , Ahmad Allahaweh, Rakan Haddad, Ruba Hamadallah, Mina Baaji

School of Medicine, University of Jordan

Faculty of Medicine, Jordan University of Science and Technology

Background: Multiple sclerosis (MS) is the leading inflammatory neurological disease of young adults, yet up-to-date global estimates and stratified analyses of how its burden varies by sex and level of socio-demographic development are limited, with the most recent Global Burden of Disease (GBD) assessments extending only to 2019. We aimed to characterise the global and socio-demographic index (SDI)-stratified burden of MS from 1990 to 2023, quantify sex disparities, and project trends to 2050.

Method: This was a secondary analysis of GBD 2023 data. Age-standardized rates (per 100,000 population) of incidence, prevalence, deaths, and disability-adjusted life years (DALYs) were extracted for the global level and the five SDI quintiles, for both sexes combined and separately. Temporal trends were quantified using the estimated annual percentage change (EAPC), sex inequality using the female-to-male (F/M) ratio, and the SDI–burden relationship using Spearman correlation. Future burden (2024–2050) was projected using ARIMA(1,1,1) models. Statistical significance was set at p < 0.05.

Result: Globally, the age-standardized DALY rate fell by 7.2% (12.908 to 11.984; EAPC −0.334%/yr, p < 0.001) and mortality by 8.9% (0.230 to 0.209; EAPC −0.396%/yr, p < 0.001), while prevalence rose by 8.7% (21.310 to 23.155; EAPC +0.247%/yr) and incidence remained stable (−1.8%). These improvements were confined to High-SDI regions; all lower-SDI groups worsened, with Low-middle SDI showing the largest rises in DALYs (+43.9%) and mortality (+115.6%), and High-middle SDI the largest increase in prevalence (+41.6%). Females carried a consistently higher burden, with a prevalence F/M ratio of ~2.3 and widening DALY (1.71 to 1.78) and mortality (1.38 to 1.46) gaps as male rates declined faster. ARIMA projections indicate a plateau through 2050 (DALYs ~11.9, prevalence ~23.1, mortality ~0.207, and incidence ~0.76 per 100,000).

Conclusion: The global burden of MS shifted substantially between 1990 and 2023. Advances in diagnosis and disease-modifying therapy have reduced disability and mortality in high-SDI settings, but the burden is rising steeply in lower-SDI regions and remains disproportionately high among women. Strengthening MS surveillance in low- resource settings and addressing persistent sex disparities are urgent priorities for equitable global neurological care

Early Cardiac Manifestations as the Initial Presentation of Duchenne Muscular Dystrophy in Infancy

Feras Shatarat , Jana Alkasasbeh, Sofian Tarawneh

Duchenne muscular dystrophy (DMD) is an X-linked neuromuscular disorder most commonly diagnosed between four and five years of age, while diagnosis during infancy remains uncommon due to initially normal neurological examinations and delayed onset of motor weakness. Although dystrophin deficiency affects cardiac muscle from birth, clinically apparent cardiac involvement is generally considered a later manifestation, rendering echocardiographically evident structural cardiac abnormalities during infancy rare. We report a male infant with normal early motor development who initially presented at nine months of age with fever, dark urine, elevated transaminases, and markedly increased serum creatine kinase (CK) levels, which were initially attributed to hemolysis and presumed as viral myositis in the context of glucose-6-phosphate dehydrogenase deficiency. CK levels remained persistently elevated, prompting further evaluation. At 12 months of age, neurological examination was normal; however, cardiac assessment revealed mild left ventricular dilatation with preserved systolic function on echocardiography and electrocardiographic features consistent with left ventricular hypertrophy. Genetic testing subsequently confirmed an out-of-frame exon 44 deletion consistent with Duchenne muscular dystrophy. Motor stagnation became apparent by 15 months of age, while serial echocardiographic assessments demonstrated persistent but stable left ventricular dilatation. This case illustrates an early cardiac presentation of Duchenne muscular dystrophy in which structural cardiac abnormalities preceded overt neuromuscular manifestations. In infants presenting with persistent elevation of serum creatine kinase beyond the expected recovery period of intercurrent illness, further evaluation, including early cardiac assessment, may be clinically important, even when neurological examination and early motor development appear normal.

poster presentations

presenters:

Knowledge of assessment about Tourette's Syndrome among Medical Students and General practitioners in Jordan: A Cross-Sectional Study

Khaled Alsawalmeh, Aws Alqudah, Abed Elhakam El-lababneh, Obadah Alayasrah, Shaher Almasri

Introduction:
Tourette syndrome (TS) is a chronic childhood-onset neurodevelopmental disorder that is frequently underrecognized and surrounded by misconceptions, contributing to delayed diagnosis and stigma. Data on TS knowledge among medical trainees and physicians in Jordan are limited.

Objective
To assess knowledge of TS among medical students in Jordanian public universities and general practitioners (GPs) working in Jordan, and to identify factors associated with higher knowledge scores.

Methods:
This IRB-approved cross-sectional study (Al-Yarmouk University; IRB/2024/571) was conducted from December 2024 to May 2025 using an online, self-administered questionnaire distributed via email, social media, and in-person outreach. Participants included medical students from 6 Jordanian public universities and GPs employed in Jordanian health care facilities. A total of 385 respondents were analyzed (281 students and 104 GPs). Sociodemographic and educational characteristics, prior awareness of TS, and reported sources of TS information.
Knowledge was measured using a structured questionnaire based on Tourette Association of America–aligned information. A composite knowledge score was calculated from correct responses (total score range, 0–27), and knowledge level was categorized as poor (<50%), moderate (50%–70%), or excellent (>70%). Group comparisons used tests/ANOVA and nonparametric confirmation where appropriate. Associations with knowledge level were assessed using χ^2 tests with Cramer V; correlations were assessed using Spearman rank correlation.

Results:
Among 385 respondents (244 female [63.4%]; 349 aged 18–24 years [90.6%]), mean (SD) total knowledge score was 11.81 (6.67). Overall, 247 participants (64.2%) had poor knowledge, 101 (26.2%) moderate knowledge, and 37 (9.6%) excellent knowledge. Prior awareness of TS was reported by 317 participants (82.3%) and was strongly associated with higher total scores (mean [SD], 13.97 [5.00] vs 1.75 [3.51] among those unaware; P<.001). Females scored higher than males on total knowledge (12.65 [6.51] vs 10.35 [6.72]; P=.001), and knowledge differed significantly by academic year (Kruskal-Wallis H=33.57; P<.001), with higher scores in advanced years. GPs had higher diagnostic/management sub scores than students (8.33 [4.33] vs 7.18 [4.52]; P=.026). Knowledge level was associated with gender ($\chi^2(2)=9.66$; P=.008; Cramer V=0.158) and university ($\chi^2(12)=25.38$; P=.013; Cramer V=0.182), but not with GPA category (P=.411).

Conclusions and Relevance:
Knowledge of TS among Jordanian medical students and GPs was generally low, with nearly two-thirds demonstrating poor knowledge. Prior awareness and educational exposure were the strongest correlates of higher knowledge, supporting the need for structured curricular integration and reinforced training on TS diagnosis, comorbidity assessment, and evidence-based management.

Development of an Interactive Spinal Cord Tract Teaching Model

Ahmad Wasfi Mufleh AlNemrat

Aqaba Medical Sciences University (AMSU), Aqaba, Jordan

Introduction:
The spinal cord contains highly organised ascending and descending tracts responsible for sensory, motor, and autonomic functions. Accurate localisation of spinal cord lesions requires a thorough understanding of tract anatomy, decussation patterns, and functional organisation. This project aims to enhance student understanding of spinal cord neuroanatomy through an interactive model that demonstrates both the structural and functional aspects of neural pathways.

Objective:
To address Traditional teaching methods challenges, an interactive educational model is proposed that combines three-dimensional anatomical representation with optical fibre technology and simulated neural conduction.

Methodology:
A three-dimensional spinal cord model, adapted from existing open-source anatomical designs, will be produced using 3D-printing technology at approximately one-third of anatomical scale. Optical fibres will be incorporated to represent major ascending, descending, and autonomic pathways.

Expected Results:
Improved visualisation of spinal cord anatomy and neural pathway organisation. Enhanced understanding of tract decussation and lesion localisation. Increased student engagement through interactive learning. Better retention of neuroanatomical concepts compared with traditional teaching methods. A cost-effective educational model suitable for classroom and laboratory teaching.

Discussion & Benefits:
The proposed model transforms abstract neuroanatomical concepts into a tangible and interactive learning experience. By integrating optical fibres and simulated signal transmission, students can visualise both anatomical structures and functional neural pathways. The model also demonstrates clinically relevant relationships between tract anatomy and neurological deficits, potentially strengthening diagnostic reasoning and clinical application of neuroanatomical knowledge.

Conclusion:
This project presents an interactive spinal cord teaching model that simulates neural conduction. By enhancing visualisation and engagement, the model has the potential to improve understanding, retention, and clinical application of spinal cord neuroanatomy.

Effectiveness of Remote Versus Standard In-Person Deep Brain Stimulation Programming in patients With Parkinson's Disease: A systematic Review and Meta-Analysis

Assem Sameer Ahmad Alsobeh, Omar Helmy, Leen Jarrad

Faculty of medicine, Tanta University, Egypt

Faculty of Medicine, An-Najah National University, Palestine

Background:
Remote programming (RP) provides a suitable alternative for patients with Parkinson disease (PD) who have undergone deep brain stimulation (DBS), potentially reducing the burden of travel and related costs. However, the comparative clinical effectiveness with standard in-person programming (SP) is still heterogeneous. We aimed to compare the clinical effects of RP with SP.

Methods:
We searched PubMed, Web of Science, Cochrane and Scopus from inception to August 2026 to identify relevant Randomized Controlled trials (RCTs) and observational studies that compare between RP and SP. Three authors independently screened the studies and extracted the needed information. Risk of bias was assessed by Cochrane Risk of Bias 2 (RoB 2) for RCTs and ROBIN-I for observational studies. Sensitivity analysis and leave-one-out analysis were conducted to assess the robustness of the findings using R (version 4.6.1) and RStudio.

Results:
two RCTs and four retrospective cohort studies were included in this study. There was only significance difference between RP and SP groups in depression (MD=-1.05, 95% CI [-2.01, -0.09]; P=.03; I2=0%). No statistically significant differences were observed between RP and SP groups in non-motor experiences of daily live (SMD=.20, 95% CI [-.15, .55]; P=.27; I 2=0%),motor experiences of daily live (SMD=.05, 95% CI [-.30, .40]; P=.55; I2=0%), motor function (SMD= 0.26, 95% CI [-0.19, 0.70]; P=.25; I2=62%), motor complications (SMD= 0.28, 95% CI [-0.15, 0.70]; P=.20; I2=0%), patient's quality of life (SMD=-.08, 95% CI [-.45, .29]; P=.66; I2=0%) and medication requirement (MD= 10.55, 95% CI [-93.26 , 114.37]; P= 0.84; 95% PI [-320.56, 341.66]; I2=93%).

Conclusion:
RP shows comparable clinical outcomes to SP. Among all assessed outcomes a statistically significance difference was only observed in depressive symptoms, so no definitive preference for either method over the other in clinical outcomes. Further high quality, large sample studies are required to validate the effects of RP.

Patient Selection Criteria and Postoperative Rehabilitation Protocols After Selective Dorsal Rhizotomy in Children With Spastic Cerebral Palsy: A Systematic Review of Studies Published 2016–2026

Ayham Ahmad Mahmmoud Quseni, Ayham Quseni, Mohammad Al-Wardat

Department of Rehabilitation Science, Faculty of Applied Medical Sciences, Jordan University of Science and Technology, Irbid , Jordan

Background:
Selective dorsal rhizotomy (SDR) is an established treatment for spasticity in children with cerebral palsy (CP), but patient-selection criteria and postoperative rehabilitation protocols vary across centers. This review aimed to synthesize how these are reported in recent literature and their association with outcomes.

Methods:
PubMed, Scopus, Cochrane CENTRAL, and PEDro were searched in September 2026 following PRISMA 2020. Studies of children ≤18 years with spastic CP undergoing SDR were eligible if they reported selection criteria, postoperative rehabilitation, or their association with outcomes. Risk of bias was assessed with RoB 2, ROBINS-I, or JBI tools. Screening was performed by one reviewer with verification of a 20% sample, and findings were synthesized narratively.

Results:
Sixty-seven studies were included (606 records; 83 full texts assessed). Only 13 studies (19%) reported explicit candidacy criteria and 13 (19%) a detailed physiotherapy protocol. Exclusion of significant dystonia was the most consistently reported selection principle. A 552-patient registry showed that the proportion of rootlets cut ranged from 21% to 100% and was associated with GMFCS level. In one audit, no child received the full recommended 2-year physiotherapy dose. Comparative long-term studies showed durable spasticity reduction but a narrowing or non-significant functional advantage over non-SDR groups. Hip and spinal risks rose with GMFCS level. Risk of bias was serious in 51 of 53 ROBINS-I-assessed studies.

Conclusion:
Explicit reporting of SDR selection and rehabilitation protocols is uncommon, and most decisions vary across centers with limited outcome evidence. Standardized reporting, adequate postoperative rehabilitation delivery, and realistic long-term counselling of families are needed.

QTc Dispersion in Patients With Epilepsy Compared With Non-Epileptic Controls in Middle Eastern Populations: A Systematic Review and Meta-analysis

Hashem Al-Odainat, Hashem Magableh, Rami Ababneh, Bisher Alhabies

Faculty of Medicine, Yarmouk University, Irbid, Jordan

Background:
Epilepsy may be associated with altered cardiac autonomic function and ventricular repolarization. QTc dispersion (QTcD) measures heterogeneity in ventricular repolarization. We aimed to quantify differences in QTcD between individuals with epilepsy and non-epileptic controls in Middle Eastern populations.

Methods:
This systematic review and meta-analysis followed PRISMA 2020 and was registered in PROSPERO (CRD420261505182). PubMed/MEDLINE and Scopus were searched from inception to September 13, 2026. Comparative observational studies of Middle Eastern populations reporting QTcD in epilepsy and control groups were eligible. Two reviewers independently performed study selection, data extraction, and risk-of-bias assessment. QTcD was analyzed using mean differences (MDs) with 95% confidence intervals (CIs) in random-effects models. Prespecified age-based subgroup and leave-one-out sensitivity analyses were performed. Egger's regression assessed small-study effects, and certainty was evaluated using GRADE.

Results:
Seventeen studies were included, of which 11 studies comprising 1,326 participants (797 with epilepsy and 529 controls) contributed to the meta-analysis. All 11 studies used 12-lead electrocardiography and Bazett-corrected QT intervals. QTcD was higher in the epilepsy group in all contributing studies. Pooled QTcD was greater in epilepsy than controls (MD, 18.19 ms; 95% CI, 10.96–25.41; $P < 0.0001$), with very high heterogeneity ($I^2 = 96.7\%$; $\tau^2 = 137.32$). QTcD was greater in pediatric participants (8 studies; MD, 19.76 ms; 95% CI, 10.05–29.47; $I^2 = 97.7\%$) and adults (3 studies; MD, 13.83 ms; 95% CI, 8.99–18.66; $I^2 = 48.6\%$). Leave-one-out pooled MDs ranged from 15.55 to 19.98 ms and remained significant. Egger's regression indicated funnel-plot asymmetry ($P = 0.049$). Certainty was very low.

Conclusion:
Epilepsy was associated with greater QTcD than non-epileptic controls in Middle Eastern populations. The association remained significant in sensitivity analyses but was accompanied by substantial heterogeneity and potential small-study effects. Very low certainty limits confidence in the magnitude and consistency of the association.

AQP4-IgG-Positive Neuromyelitis Optica Spectrum Disorder Presenting as Acute Hemiparesis in a Child with Repaired Tetralogy of Fallot: A Stroke Mimic

Haya Jaradat, Ahmad Shalaldah, Majd badran, Sharif issa basa

Faculty of Medicine and Health Sciences, An-Najah National University, Nablus, Palestine

Faculty of medicine, Arab American University, Jenin Palestine

Background:
Acute hemiparesis in children requires urgent evaluation for ischemic stroke. However, cervical spinal cord lesions may produce asymmetric weakness that mimics a cerebral vascular event. Distinguishing inflammatory myelitis from ischemia can be challenging when diffusion restriction is present

Case Presentation:
A 12-year-old boy with repaired tetralogy of Fallot presented with sudden-onset left-sided weakness following neck pain, accompanied by three episodes of vomiting. Initial examination revealed severe left-sided weakness (Medical Research Council grade 1/5 in the upper limb and 2/5 in the lower limb), brisk left-sided reflexes, left lower-limb clonus, and a truncal sensory level around T6–T7. The abrupt focal neurological deficit and associated vomiting prompted an urgent cerebrovascular evaluation. Brain imaging revealed a tiny 2-mm left thalamic focus of true diffusion restriction, raising the possibility of a concurrent cerebral ischemic lesion, although this finding did not fully explain the clinical presentation. Subsequent cervical spine MRI demonstrated an approximately 4.5-cm intramedullary lesion extending from C2 to C5, with cord expansion, T2/STIR hyperintensity, predominant gray matter involvement, and true diffusion restriction, characterized by high diffusion-weighted imaging signal and corresponding low apparent diffusion coefficient values. These findings complicated the distinction between inflammatory myelitis and spinal cord ischemia. The subsequent development of right-sided sensory and motor symptoms further supported spinal cord involvement. Serum aquaporin-4 immunoglobulin G (AQP4-IgG) was positive by cell-based assay, strongly supporting AQP4-IgG-positive neuromyelitis optica spectrum disorder (NMOSD) in the context of acute myelitis. Following inpatient management, including plasma exchange, the patient regained full right-sided strength and improved sufficiently to stand and walk with minimal assistance, although. residual left-sided weakness and sensory abnormalities persisted at discharge

Conclusion:
This case highlights AQP4-IgG-positive NMOSD as an important pediatric stroke mimic. The abrupt hemiparetic presentation, neck pain, vomiting, and diffusion-restricted lesions in both the left thalamus and cervical spinal cord complicated the initial diagnostic assessment. Integrating neurological findings, evolving symptoms, spinal MRI, and AQP4-IgG testing was essential in identifying the underlying inflammatory. Myelopathy while acknowledging ischemia as an important differential diagnosis

Clinical Features, Management Strategies, and Outcomes of Moyamoya Syndrome Among Down Syndrome Patients: A Systematic Review

Jawad Allahaweh, Omar Alomari, Ayham Allahaweh, Ahmad Allahaweh, Yousef Alhisa, Rakan Haddad, Ruba Hamadallah, Mina Baaji, Mahmoud Abdallat

Jordan University of Science and Technology

Hamidiye International School of Medicine, University of Health Sciences Faculty of Pharmacy,

School of Medicine, University of Jordan

Department of Neurosurgery, University of Jordan

Background:
Moyamoya disease is a progressive cerebrovascular disorder characterized by intracranial arterial stenosis and fragile collateral formation. Individuals with Down syndrome are predisposed to a secondary form, termed moyamoya syndrome. This review aimed to characterize the clinical features, radiological findings, management, and neurological outcomes of moyamoya syndrome in Down syndrome.

Methods:
Following PRISMA guidelines and PROSPERO registration, PubMed, Scopus, and Web of Science were searched from inception to April 30, 2026. Observational studies, case series, and case reports were eligible. Data on clinical presentation, imaging, interventions, and outcomes were extracted. Quality was assessed using JBI checklists and NIH tools.

Results:
Sixty-four studies (1982–2026) comprising 724 patients were included; individual patient data were available for 87. Ischemic stroke was the predominant presentation (79.3%), most often with hemiparesis (77.0%). Infarction was radiologically confirmed in 90.8%, with posterior circulation involvement in 33.0%. Magnetic resonance imaging was the main diagnostic modality (51.7%). Overall, 49.4% underwent surgical revascularization; combined medical and surgical management was the most common approach (39.1%), and 58.6% received aspirin monotherapy. Postoperative subdural hematoma, stroke, and seizure each occurred in 2.3%. Outcomes were favorable in most patients, with 56.3% improving and 12.6% remaining stable. Narrative synthesis of retrospective studies showed high preoperative stroke rates, advanced Suzuki stages, a strong association with autoimmune comorbidities, and a prediagnostic compensatory rise in blood pressure that normalized after successful revascularization.

Conclusion:
Moyamoya syndrome in Down syndrome carries a heavy ischemic stroke burden and warrants high clinical suspicion. Surgical revascularization, often combined with medical therapy, appears safe and is associated with favorable neurological outcomes and vascular stability.

Rituximab for Relapse Prevention in Anti-NMDA Receptor Encephalitis: A Systematic Review and Meta-analysis

Karam Hani Alqudah, Feras Alshatarat Hala Alblewi, Afnan Abukhadra

Faculty of Medicine, Mu'tah University, Al-Karak, Jordan
Aqaba Medical Sciences University (AMSU), Aqaba, Jordan

Background:
Relapse remains an important concern in anti-N-methyl-D-aspartate receptor (anti-NMDAR) encephalitis. Rituximab is increasingly used to reduce recurrence, although its long-term effectiveness remains incompletely defined. We therefore evaluated the association between rituximab therapy and relapse risk in anti-NMDAR encephalitis.

Methods:
PubMed/MEDLINE, Embase, Web of Science, and the Cochrane Library were systematically searched for studies evaluating rituximab and subsequent relapse in patients with anti-NMDAR encephalitis. The primary analysis pooled time-to-event estimates as hazard ratios (HRs), while dichotomous relapse outcomes were synthesized using risk ratios (RRs). Statistical heterogeneity was assessed using the I^2 statistic, and evidence on treatment timing was summarized separately.

Results:
Eight studies were included. Three cohorts contributed to the primary time-to-event analysis, in which rituximab was associated with a substantially lower hazard of relapse (pooled HR 0.24, 95% CI 0.12–0.49; I^2=0%). Findings were consistent in the analysis of dichotomous relapse outcomes (pooled RR 0.41, 95% CI 0.23–0.72; I^2=0%), with a similar result in sensitivity analysis (RR 0.37, 95% CI 0.16–0.84). Evidence regarding treatment timing was less uniform, although several studies suggested a potential advantage of earlier B-cell depletion.

Conclusions:
Rituximab was consistently associated with a lower risk of relapse in anti-NMDAR encephalitis across complementary analytical approaches. These findings support its potential role in relapse prevention, while highlighting the need for prospective studies to clarify the optimal timing, duration, and retreatment strategy.

Neurological Functional Outcomes Following Vestibular Schwannoma Surgery: Evaluation of Hearing Preservation and Facial Nerve Function

Leen Elbagir Elamin Abbas, Farah Ibrahim—Batterjee Medical College, Leen Abbas—Applied Science University, Huthaifa AbdulQader

Vestibular schwannoma (VS) is a benign tumor arising from Schwann cells of the vestibulocochlear nerve. Although surgical management aims to remove or control the tumor, postoperative hearing and facial nerve outcomes may vary according to surgical approach and tumor characteristics. A literature review was conducted including 6 retrospective clinical studies, 4 systematic reviews and meta-analyses, and 3 narrative reviews evaluating hearing preservation and facial nerve function following vestibular schwannoma surgery. Hearing preservation outcomes varied across surgical approaches, with serviceable hearing retained in 17% of patients following the retrosigmoid approach and 43.8% following modified translabyrinthine surgery. Postoperative hearing decline was also reported across surgical series. Facial nerve outcomes were assessed using theHouse–Brackmann (HB) grading system, with HB grade I–II function reported in 59–68% of patients in one study and 65% in another. HB grade I–II facial nerve function was observed in 96.9% of patients on postoperative day one. Larger tumor size was associated with less favorable facial nerve outcomes. Variations in surgical approaches, tumor characteristics, and outcome assessment methods limited direct comparison between studies. Overall, hearing and facial nerve outcomes varied following vestibular schwannoma surgery, emphasizing the need to balance tumor treatment with preservation of neurological function.

Food and empathy correlation: A pilot cross-sectional study

Lubna Amjad Atieh Abu Sirhan, Sara Suwan, Ashraf Khasawneh, Raghda Mohammad, Dina Hyari, Lubna Abu Shanab, Lubna Abu Sirhan, Maram Aqilan, Khaled Albakri

The Hashemite University, Faculty of Medicine, Department of Microbiology, Pathology, and Forensic Medicine

Background:
People's diet has been linked to mental health, and empathy is a key component of good mental health since it helps in building healthy relationships. However, few studies have investigated the relationship between empathy and nutrition. Due to the lack of research in this field, the present study explores the association of macronutrients and micronutrients with empathy.

Methods:
This pilot cross-sectional study involved 30 participants aged 19–43 years. Three dietary records were obtained from the participants to assess nutrient intake. The Emotion Recognition Task (ERT), Pictorial Empathy Test (PET), Questionnaire of Cognitive and Affective Empathy (QCAE) and Basic Empathy Scale (BES) were used to measure empathy.

Results:
Dietary intakes of magnesium (p=0.03, r=0.397), potassium (p=0.043, r=0.373) and zinc (p=0.004, r=0.509) were significantly correlated with the affective subscale of the BES. There was a significant inverse association between the BES cognitive subscale and iodine intake (p=0.037, r=−0.383), and a significant correlation between the mean PET score and consumption of sugar (p=0.023, r=0.413), vitamin C (p=0.024, r=0.411) and vitamin B2 (p=0.048, r=0.364).

Conclusion:
This study found an association between dietary intake of sugar, magnesium, potassium, zinc, vitamin C and vitamin B2 and the affective component of empathy, while iodine intake was inversely associated with cognitive empathy. University major also influenced cognitive empathy, whereas no difference in empathy was found between genders. These findings may help people who lack empathy, as well as those whose jobs require it, such as those in the medical field.

Pediatric Brain Abscess Secondary to a Retained Airway Foreign Body: A Case-Based Review and Diagnostic Pathway

Ahmad Wasfi Mufleh AlNemrat

Moawiah abed ali qbelat, moawiah qbelat, Feras Shatarat, Amer A.Alomari

Background:
A retained airway foreign body is an uncommon and easily overlooked source of pediatric brain abscess, particularly when aspiration is unwitnessed and respiratory symptoms are minimal or absent. This case-based review combines an illustrative patient with 12 previously reported cases to identify clinical and microbiological clues that should prompt airway evaluation and to propose a practical diagnostic pathway.

Case presentation:
A previously healthy 12-year-old girl presented with fever, a generalized tonic–clonic seizure and altered consciousness. Neuroimaging revealed a large left parietotemporal brain abscess with mass effect and midline shift, while thoracic imaging demonstrated a radiopaque foreign body in the right bronchus intermedius with chronic post-obstructive pulmonary changes. Following urgent neurosurgical drainage and bronchoscopic removal, Streptococcus anginosus group organisms were isolated from both the intracranial abscess and a protected distal bronchial sample. Multilocus sequence typing demonstrated identical alleles at all seven loci and the same sequence type in the paired isolates, strongly supporting a shared bronchopulmonary source with hematogenous dissemination. Among the 12 previously reported patients, an aspiration-related event was documented in only six, whereas objective pulmonary infection or post-obstructive injury was present in nine. After coordinated source control and nine weeks of intravenous antimicrobial therapy, the patient recovered without neurological sequelae.

Conclusions:
In children with an otherwise unexplained brain abscess, the absence of a recalled choking event or prominent respiratory symptoms does not exclude a retained airway foreign body. Directed history-taking, chest imaging, and timely bronchoscopy can establish the airway diagnosis, while paired microbiological sampling and molecular typing can strengthen source attribution. Coordinated treatment of both the intracranial and bronchopulmonary foci is essential

Proteomic studies in VWA1-related neuromyopathy allowed new pathophysiological insights and the definition of blood biomarkers

Mohammad Jamil Athamneh, Nassam Daya - Andrea Gangfuss, Tobias Runk, Schara-Schmidt, Albert Sickmann, Anne-Katrin Güttsche, Charité, Andreas Roos

University Hospital Essen Andreas Hentschel - Leibniz-Institut für Analytische Wissenschaften Yarmouk University, Faculty of Medicine

University Duisburg-Essen

University Hospital Bergmannsheil Bochum

Bi-allelic variants in VWA1, encoding Von Willebrand Factor A domain containing 1 protein localized to the extracellular matrix (ECM), were linked to a neuromuscular disorder with manifestation in child- or adulthood. Clinical findings indicate a neuromyopathy presenting with muscle weakness. Given that pathophysiological processes are still incompletely understood, and biomarkers are still missing, we aimed to identify blood biomarkers of pathophysiological relevance: white blood cells (WBC) and plasma derived from six VWA1-patients were investigated by proteomics. Four proteins, BET1, HNRNPDL, NEFM and PHGDH, known to be involved in neurological diseases and dysregulated in WBC were further validated by muscle-immunostainings unravelling HNRNPDL as a protein showing differences between VWA1-patients, healthy controls and patients suffering from neurogenic muscular atrophy and BICD2-related neuromyopathy. Immunostaining studies of PHGDH indicate its involvement in apoptotic processes via co-localisation with caspase-3. NEFM showed an increase in cells within the ECM in biopsies of all patients studied. Plasma proteomics unravelled dysregulation of 15 proteins serving as biomarker candidates among which a profound proportion of increased ones (6/11) are mostly related to antioxidative processes and have even partially been described as blood biomarkers for other entities of neuromuscular disorders before. CRP elevated in plasma also showed an increase in the extracellular space of VWA1-mutant muscle. Results of our combined studies for the first time describe pathophysiologically relevant biomarkers for VWA1-related neuromyopathy and suggest that VWA1-patient derived blood might hold the potential to study disease processes of clinical relevance, an important aspect for further preclinical studies.

A Giant Frontotemporoparietal Cystic Ependymoma (CNS WHO Grade 3) in a 4-Year-Old Boy: Clinicoradiological, Operative, and Histopathological Features

Nada Maher Omran Quraan, Juman Irshaid. Nada Quraan, Aseel Shalalfeh, Dr Mousa

Ependymomas are the third most common primary brain tumor in children. Whereas Supratentorial ependymomas are uncommon pediatric central nervous system tumors with diverse clinical and radiological presentations. In this case report, we present a 4 year old child whose only complaint was a headache for one month. A CT was done and showed a large right frontotemporoparietal cystic brain lesion measuring approximately 7510 cm with a solid component measuring approximately 453 cm. Despite the large size of the tumor the patient was neuralgically intact, with a Glasgow Coma Scale of 15/15 and 5/5 motor power in all four limbs. He underwent a microscopic resection of the large right temporal intraxial brain tumor through an extended pterional approach , and the operating surgeon reported a good final resection. On postoperative day 2, the patient had a transient weakness in the left side accompanied with right sided facial swelling, which resolved to full motor power within the same hospitalization. Histopathological examination showed features consistent with Supratentorial ependymomas, CNS WHO grade 3. This case demonstrates that a large ependymoma can present with mild symptoms such as isolated headache and persevered neurological function, it also highlights the importance of early recognition and timely surgical intervention, which may help prevent further neurological deterioration and contribute to favorable neurological outcomes despite a substantial tumor burden.

Lifespan Psychological Distress and Health-Related Quality of Life Among Caregivers of Patients with Myelomeningocele: A Cross-Sectional Study

Ola Monkeez Al Ahdab, Abdullah Qasoul, Mohammad Al-Hanaktah, Mohammed Saadeh, Salma Adel, Sereen Ahmad, Qussay Alsabbagh

Department of Psychiatry, Jordan University Hospital, University of Jordan, Amman, Jordan
Jordan University Hospital, University of Jordan, Amman, Jordan
Department of Psychiatry, Maryland Psychiatric Research Center, University of Maryland School of Medicine, Baltimore, Maryland, USA
Department of Neurosurgery, Jordan University Hospital, University of Jordan, Amman, Jordan

Background:
Myelomeningocele (MMC) requires intensive, lifelong multidisciplinary management that imposes substantial demands on families. Despite the complex neurosurgical morbidity associated with MMC, empirical evidence evaluating long-term psychological burden and health-related quality of life (QoL) among caregivers, particularly across the transition into adulthood, remains limited. We investigated the prevalence of anxiety and depression, assessed QoL domains, and identified predictors of distress in primary caregivers of patients with MMC.

Methods:
This cross-sectional study evaluated 45 primary caregivers of MMC patients who underwent surgical repair. Institutional Review Board approval was obtained, and all participants provided informed consent. Data were collected via structured telephone interviews using validated Arabic versions of the Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI), and 36-Item Short Form Health Survey (SF-36). Subgroup comparisons between caregivers of pediatric (<18 years) and adult (≥18 years) patients utilized independent-samples t-tests and Chi-square analyses. Multivariate linear regression models identified independent predictors of anxiety and depression.

Results:
Among 45 caregivers, 51.1% were female and 53.3% had monthly household incomes <500 JOD. Moderate-to-severe anxiety and depression were identified in 37.8% (n=17) and 22.2% (n=10) of caregivers, respectively. Distress severity distributions did not differ between pediatric and adult groups for anxiety (38.5% vs. 36.8%, p=0.871) or depression (23.1% vs. 21.1%, p=0.865). Impairments on the SF-36 were most pronounced for Mental Health (31.9 ± 11.9) and Vitality (34.3 ± 15.3). Caregiver physical functioning was significantly lower in the adult group compared to the pediatric group (55.3 ± 30.5 vs. 71.9 ± 24.3, p=0.043) and trended as an independent predictor of anxiety (β = -0.13, p=0.076).

Conclusion:
Caregivers of individuals with MMC experience persistent, clinically significant anxiety and depression that endure across the patient's lifespan into adulthood without alleviation. Interventions must prioritize sustained mental health screening and family-centered functional support beyond pediatric transition.

Association between childhood atopic conditions and frequent or severe headaches in adolescents: a nationally representative study using IPUMS NHIS dataset

Rawan M Aqaileh, Reem F Yousef, Maria M AlOmari, Layla T Naimi

School of Medicine, University of Jordan

Objective:
Headaches and inflammatory conditions including asthma and hay fever share profound biological mechanisms like systemic inflammation, immune dysfunction, and increased neuropeptide activity. Previous studies demonstrated a bidirectional relationship between asthma and migraine. However, population-level evidence evaluating the cumulative burden of atopic conditions on adolescent headaches remains limited. This study investigated the association between childhood asthma, hay fever, and frequent or severe headaches among adolescents.

Methods:
Data were extracted from the Integrated Public Use Microdata Series (IPUMS) National Health Interview Survey (1997–2018). We included adolescents aged 12–17 years (N = 91,333). Exposures were categorized into four groups: Neither, Asthma Only, Hay Fever Only, or Both. The primary outcome was self-reported frequent or severe headaches/migraines in the preceding 12 months (FHEADYR). Complex survey design weights, strata, and primary sampling units were incorporated. Logistic regression estimated Adjusted Odds Ratios (aOR) and 95% Confidence Intervals (CI), adjusting for age.

Results:
The weighted prevalence of frequent or severe headaches was 7.32% (95% CI [7.07, 7.56]) in adolescents with neither condition, 14.7% (95% CI [13.9, 15.5]) in asthma only, 14.7% (95% CI [13.6,15.7]) in hay fever only, and 21.8% (95% CI [20.1, 23.5]) in both conditions. In age-adjusted analyses, compared to adolescents with neither condition, those with asthma only (aOR = 2.19, 95% CI [2.04, 2.36]) or those with hay fever only (aOR = 2.18, 95% CI [2.00, 2.38]) were associated with more than double the odds of severe headaches. Co-morbid asthma and hay fever demonstrated an additive effect, increasing odds of severe headaches more than threeand-a-half-fold (aOR = 3.52, 95% CI [3.17, 3.90]).

Conclusions:
Childhood atopic diseases are independently and additively associated with frequent or severe headaches in adolescence. Paediatric clinicians evaluating adolescents with recurrent headaches should consider underlying atopic multimorbidity as a potential contributing factor or clinical marker.

Fluorescein-guided Surgery in Brain Tumors: A Systematic Review and Meta-analysis

Reem Abed Hussein Alwahsh, Sadeen Eid, Yousef Al-Bojoq, Amer Alomari, Luciano Mastronardi, Omar Bushnaq, Mohamed Al-Khateeb, Heba Aboeqab, Neveen Muqbel, Bashar Abualsebaa, Bara M. Hammadeh

Al-Balqa' Applied University
Jordan University of Science and Technology
San Filippo Neri Hospital
Mutah University
University of Jordan

Objective:
Fluorescein sodium (FS) has become increasingly popular in neurosurgery as a low-cost intraoperative fluorophore to improve tumor margin visualization and achieve maximum resection (EOR) in the brain tumor resection. Even with its growing adoption, evidence is still mixed on its efficacy, safety and optimal use.

Background:
The purpose of this systematic review and meta-analysis was to assess the clinical effectiveness, safety, and utility of SF-guided surgery in brain tumors with emphasis on the resection rates, dosage, the time of administration, and the adverse outcomes.

Methods:
Using PRISMA and JBI recommendations, PubMed, Scopus, and Google Scholar have been thoroughly searched. Eighty-eight clinical trials, cohort and case series and reports were analysed. Independent reviewers carried out data extraction and critical appraisal, and meta-analysis was done on EOR outcomes.

Results:
The results of the resection between 22 clinical trials and cohort studies (2509 SF patients and 2642 controls) reported pooled odds ratio of 1.28 (95% CI: 0.88–1.86) with high heterogeneity. Subtotal resections supported SF (OR: 0.39, 95% CI: 0.25–0.63) whereas, controls led in total resections. General usefulness was 97.3%. Increase in SF doses (10–20mg/kg) caused significant differences in total resection rates (88.2% vs.77.1%, χ_2=21.11, p<0.001). Dural incision timing was found to provide better EOR in comparison to timing at anesthesia induction (86.1% vs. 83.8%, p=0.034). In 5,421 patients, the most frequent use of SFs was in the case of glioblastomas and metastases, where 82.3% of all patients who received an intervention had undergone total resection compared with 72.5% who did not. The number of adverse events was low and mostly mild (93.8%).

Conclusions:
Neurosurgery guided by SF improves the visualization and increase the conversion of subtotal to total resection and dose and timing had significant effects. It is safe, can be used in a broad range of tumor types and locations.

A Reassuring ECG Is Not Enough in Myotonic Dystrophy Type 1: A Systematic Review and Meta-analysis

Reem Abed Hussein Alwahsh, Feras Shatarat, Osama Bdarnh, Amer A. Alomari, Rahaf Alshatarat, Jana Alkasasbeh, Reem Alwahsh, Mariana Qaqish, Obaida Falah, Ruwa Naimat, Husam Abu Odeh, Abdullah Hamad

Faculty of Medicine, Mutah University, Al-Karak
Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan
Division of Neurosurgery, Department of Special Surgery, Faculty of Medicine, Mutah University, Al-Karak, Jordan
Ministry of Health, Amman, Jordan
Department of Internal Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA
Queen Alia Military Hospital, Amman, Jordan
Division of Pulmonary Medicine, Mayo Clinic, Phoenix, Arizona, USA

Cardiac involvement is a major determinant of morbidity and premature mortality in myotonic dystrophy type 1 (MD1), yet a reassuring surface electrocardiogram (ECG) may not exclude clinically important distal conduction disease. We conducted a systematic review and meta analysis of cardiac electrical risk stratification in MD1, focusing on occult His–ventricular (HV) prolongation, prognostic ECG and HV abnormalities, and sudden cardiac death (SCD). PubMed/MEDLINE, Scopus, and ScienceDirect were searched from inception through January 31, 2026. The review followed PRISMA 2020 guidance and was prospectively registered in PROSPERO (CRD420261329528). Thirty-three studies were included. Among EPS-evaluated patients, the pooled prevalence of prolonged HV at the 70-ms threshold was 39.8% (95% CI, 36.1%–43.6%). HV ≥70 ms was present in 20.0% (95% CI, 13.5%–28.5%) despite study-defined normal or low-risk ECG findings. Surface ECG abnormalities were associated with a higher risk of SCD (pooled relative prognostic effect, 3.11; 95% CI, 1.75–5.52) and, separately, with serious cardiac or conduction-related outcomes (4.77; 95% CI, 2.75–8.28). HV ≥70 ms was independently associated with major bradyarrhythmic events and complete atrioventricular block in two adjusted cohorts; these estimates were not pooled because the endpoints differed and cohort independence was uncertain. Across broader longitudinal MD1 cohorts, the pooled cumulative proportion of SCD was 4.0% (95% CI, 3.0%–5.4%). Surface ECG is prognostically informative but cannot reliably exclude clinically relevant His–Purkinje disease. Cardiac risk assessment should therefore be longitudinal, with ECG and ambulatory monitoring forming the foundation and selected EPS providing direct assessment of distal conduction when concern persists.

A Silent Meningioma in a Child: Incidental Discovery of a Brain-Invasive Tumor with Rhabdoid Features After Minor Head Trauma

Sara AbedAlnabi, Orjwan Abualsoud, Mera AlKhatib, Natal Toukan, Faris Kayed

Najah National University, Nablus, Palestine

Background:
Meningiomas are predominantly adult tumors, and pediatric cases account for under 1% of all meningiomas. Meningiomas with brain invasion and rhabdoid features are associated with aggressive behavior and recurrence, and they usually come to attention through neurological symptoms. A meningioma with these features in a young, neurologically intact child, discovered by chance, departs sharply from this pattern. We report such a case.

Methods:
Retrospective review of the clinical, operative, and histopathologic records of a single pediatric patient treated in 2025. Informed consent for publication was obtained from the patient's parents.

Results:
A previously healthy 7 year old boy was referred after a fall with a sutured scalp laceration. CT performed for the injury incidentally revealed a right temporoparietal lesion. Despite the lesion's size, he had no loss of consciousness, vomiting, seizures, or focal deficit (GCS 15/15, motor power 5/5). Brain and whole spine MRI showed a large, strongly enhancing extra axial lesion with a cystic component. Through a right temporal craniotomy with neuronavigation, the cyst was evacuated and the tentorium attached tumor was removed in one piece, with coagulation of its attachment; the surgeon documented total resection. The resected specimen measured 4.5 × 3× 2 cm in aggregate. Histology showed classic meningothelial nests, focal brain invasion, and scattered rhabdoid cell foci (<10% of tumor cells), consistent with rhabdoid meningioma. He was extubated on postoperative day 1 and discharged on day 5, neurologically intact with a clean wound.

Conclusion:
This case shows that an aggressive appearing meningioma can stay clinically silent in a young child until unrelated trauma reveals it. Incidental extra axial lesions in children deserve contrast MRI and tissue diagnosis, and brain invasion with rhabdoid features calls for long term imaging surveillance.

Upper Limb Function and Motor Trajectories Following the Switch from Nusinersen to Risdiplam in Pediatric-Inclusive Cohorts of 5q-Spinal Muscular Atrophy: A Systematic Review

Weaam Khaled Akhuzahaya, Maria Rawashdeh, Rama AlQato, Anas Akhozaheya

Background:
Whereas disease modifying therapies (DMTs) designed to modulate splicing on SMN2, mRNA molecules have brought about an innovation in the treatment of 5q-spinal muscular atrophy (SMA), the current medical reality often requires switching therapy from intrathecally administered nusinersen to orally ingested risdiplam. The ability to maintain arm and hand functioning, assessed with the Revised Upper Limb Module (RULM), is crucial for achieving independence in the daily activities of patients who are not able to walk.

Methods:
A systematic review was executed as per the PRISMA standards by searching possible databases such as PubMed, Scopus, and Google Scholar. The included documents were examined among the pediatric population or a population including pediatric patients diagnosed with 5q-SMA (all types from 1 to 3) to determine how long the patients have been treated with nusinersen before switching to oral risdiplam treatment and its outcomes on RULM, motor function assessments (HFMSE, MFM-32), and safety profile performed for 8 to 36 months after initiation of treatment. The methodological quality of the included studies was evaluated using Newcastle-Ottawa scale and ROBINS-I.

Results:
In multiple institution studies and observational groups of 9-76 patients (who were switched from nusinersen therapy), the major factors prompting the switch were difficulties performing lumbar punctures and spinal deformities, as well as a history of spinal surgeries (in up to 57% of groups). With regard to the treatment with risdiplam, the outcomes with RULM remained unchanged; the RULM results were between -0.71 and +0.50 and thus no motor skill deterioration or improvement was registered when looking at the outcomes of HFMSE or MFM-32; however, the results differed for the young patients without previous treatment.

Conclusion:
The switch to oral risdiplam from nusinersen maintains upper limb and gross motor functions&; stability, thus avoiding complications arising from the procedure in the spine. Nevertheless, the hopes of the patient should be based on maintaining the functional stability rather than regaining motor function, while monitoring for gastrointestinal side effects and disease deterioration.

Which Slowly Expanding Lesion Metrics Predict Disability Progression in Multiple Sclerosis? A Systematic Review and Meta-analysis

Yousef Ismail Daas Almahadin, Osmam badarneh, Muath Almahadin

Background:
Slowly expanding lesions (SELs) are emerging as markers of chronic lesion activity in multiple sclerosis (MS), but it remains unclear which SEL measures are most closely linked to disability progression.

Methods:
We searched PubMed, Scopus, Web of Science, and the Cochrane Library for longitudinal studies evaluating SELs or chronic lesion expansion in MS and reporting subsequent disability outcomes. Comparable effect estimates were pooled using random-effects meta-analysis, while heterogeneous SEL metrics were synthesized separately.

Results:
Twelve longitudinal studies were included. Greater SEL log-volume was associated with a higher risk of disability progression (pooled OR 2.74, 95% CI 1.08–6.94; I2=54.7%) and with greater longitudinal EDSS worsening (pooled β=0.137, 95% CI 0.039–0.234; I2 =18.2%). A sensitivity analysis also showed a positive association between chronic lesion expansion and EDSS change (pooled r=0.218, 95% CI 0.057–0.368). Beyond absolute volume, higher SEL proportion and greater tissue damage within SELs, including lower MTR, greater T1-hypointense volume accumulation, and lower fractional anisotropy, were also linked to worse clinical outcomes. Associations appeared more consistent with longer follow-up in relapsing MS, while progressive MS studies showed more heterogeneous results.

Conclusions:
SEL burden, particularly lesion volume, is consistently associated with disability progression in MS. Relative SEL burden and measures of tissue injury may provide additional prognostic information, although current evidence remains too heterogeneous to define a single optimal SEL metric or confirm differences across MS phenotypes.

Fluorescein-guided Surgery in Brain Tumors: A Systematic Review and Meta-analysis

Reem Abed Hussein Alwahsh, Sadeen Eid, Yousef Al-Bojoq, Amer Alomari, Luciano Mastronardi, Omar Bushnaq, Mohamed Al-Khateeb, Heba Aboeqab, Neveen Muqbel, Bashar Abualsebaa, Bara M. Hammadeh

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Results:
The results of the resection between 22 clinical trials and cohort studies (2509 SF patients and 2642 controls) reported pooled odds ratio of 1.28 (95% CI: 0.88–1.86) with high heterogeneity. Subtotal resections supported SF (OR: 0.39, 95% CI: 0.25–0.63) whereas, controls led in total resections. General usefulness was 97.3%. Increase in SF doses (10–20mg/kg) caused significant differences in total resection rates (88.2% vs.77.1%, χ_2=21.11, p<0.001). Dural incision timing was found to provide better EOR in comparison to timing at anesthesia induction (86.1% vs. 83.8%, p=0.034). In 5,421 patients, the most frequent use of SFs was in the case of glioblastomas and metastases, where 82.3% of all patients who received an intervention had undergone total resection compared with 72.5% who did not. The number of adverse events was low and mostly mild (93.8%).

Conclusions:
Neurosurgery guided by SF improves the visualization and increase the conversion of subtotal to total resection and dose and timing had significant effects. It is safe, can be used in a broad range of tumor types and locations.

Fluorescein-guided Surgery in Brain Tumors: A Systematic Review and Meta-analysis

Reem Abed Hussein Alwahsh, Sadeen Eid, Yousef Al-Bojoq, Amer Alomari, Luciano Mastronardi, Omar Bushnaq, Mohamed Al-Khateeb, Heba Aboeqab, Neveen Muqbel, Bashar Abualsebaa, Bara M. Hammadeh

Al-Balqa' Applied University
Jordan University of Science and Technology
San Filippo Neri Hospital
Mutah University
University of Jordan

Objective:
Fluorescein sodium (FS) has become increasingly popular in neurosurgery as a low-cost intraoperative fluorophore to improve tumor margin visualization and achieve maximum resection (EOR) in the brain tumor resection. Even with its growing adoption, evidence is still mixed on its efficacy, safety and optimal use.

Background:
The purpose of this systematic review and meta-analysis was to assess the clinical effectiveness, safety, and utility of SF-guided surgery in brain tumors with emphasis on the resection rates, dosage, the time of administration, and the adverse outcomes.

Methods:
Using PRISMA and JBI recommendations, PubMed, Scopus, and Google Scholar have been thoroughly searched. Eighty-eight clinical trials, cohort and case series and reports were analysed. Independent reviewers carried out data extraction and critical appraisal, and meta-analysis was done on EOR outcomes.

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Clinical Characteristics and Management of Patients with Meningioma: A Retrospective Single-Center Study from Palestine

Momen Zetawi, Khitam Salahat, Mohammad Bdair, Sama Haj Hussein, Faris Kayed, Mohsen Yaish

Faculty of Medicine and Health Sciences, An-Najah National University, Nablus, Palestine
Department of Neurosurgery, Rafidia Governmental Hospital, Nablus, Palestine

Introduction:
Intracranial meningiomas vary in clinical presentation, anatomical location, pathological grade, and extent of resection. In Palestine, data describing these features and neurosurgical practice are scarce. This study aimed to characterize the demographic, clinical, radiological, histopathological, and surgical profiles of patients within the cranial meningiomas treated at a Palestinian neuro surgical center

Methods:
We conducted a retrospective case series of 21 patients receiving surgical management for intracranial meningioma. Data were extracted from medical records and summarized using means with standard deviations, medians with ranges, and frequencies with percentages. Exploratory associations with World Health Organization grade were assessed using Fisher's exact test and the Mann–Whitney U test.

Results:
The mean age was 50.2 ±14.4 years, and 12 patients (57.1%) were female. Headache was the most common presenting symptom (85.7%), followed by dizziness (57.1%), visual symptoms (28.6%), and cognitive or behavioral changes (28.6%). Most patients presented within one year of symptom onset (76.2%). Combined computed tomography and magnetic resonance imaging was performed in 71.4% of cases. The sphenoid ridge or wing was the most frequent tumor location (19.0%), and peritumoral edema was present in 28.6%. Sixteen tumors (76.2%) were WHO grade 1 and five (23.8%) were grade 2. Preoperative and postoperative steroids were administered to 66.7% and 71.4% of patients, respectively. No significant associations with WHO grade were identified.

Discussion:
Our findings are consistent with the established epidemiology of intracranial meningiomas, showing a predominance among middle-aged adults with a slight female predominance. Headache was the most prevalent presenting symptom, whereas most meningiomas are asymptomatic and are identified incidentally. Gross total resection (Simpson grades I–II) was achieved in most documented cases, although Simpson grading was frequently missing from operative reports. Regarding WHO grade, no significant associations were observed with demographic or clinical variables, possibly due to the small sample size. These findings provide preliminary data on the clinical and surgical profile of meningioma patients in a Palestinian tertiary center and support the need for larger multicenter studies with standardized pathological and surgical documentation.

Conclusion:
Most tumors were WHO grade 1 and commonly presented with headache and dizziness. Larger multicenter studies with standardized operative and pathological documentation are needed to evaluate outcomes, recurrence, and prognostic factors in Palestine.

Special needs bracelet

Rahaf Mohammad Tayseer Al Jaradeen

Introduction:

This project was inspired by the needs of people with special needs, so it was necessary to consider how to develop a device that suits their needs and at the same time supports the field of technology in our modern era.

Introducing the bracelet for people with special needs:

It is an electronic wrist bracelet designed with the aim of helping people with special needs, especially those who lack the sense of hearing and sight. The device also uses solar energy in order to charge it with the energy necessary to complete its tasks

Methods:

This device was designed to target people with special needs in general and those who lose the sense of sight and hearing in particular. Therefore, this is what we need to design this bracelet:

1. The bracelet itself
2. Sensitive to distance
3. A source of sound
4. Light source
5. Solar panel

What distinguishes the bracelet from others:

1. Protecting the lives of people with special needs
2. Low financial cost
3. Light weight, easy to carry and use
4. Suitable for males and females, as its design and color make both genders able to carry and use it
5. Moral support for people with special needs and increasing their self-confidence. They are now able to walk on their own without assistance.
6. Environmentally friendly and energy saving

How to make the bracelet:

The person turns on the bracelet and wears it with his hand, and then the distance sensor measures the distance from the four sides (in front, behind, and both sides) and alerts the wearing person if there is an obstacle (such as a pothole, a car, a person, or any danger that might collide with him).

This step is done by By emitting a sound to alert the blind and inform them that there is an obstacle surrounding them, and a light to alert the blind.

Perhaps the most important characteristic of the bracelet is that it is environmentally friendly.

In the digital age, consideration must be given to introducing technology and saving energy, so the idea emerged of placing a small panel of solar energy on top of the bracelet so that it can charge itself on its own while walking and being exposed to sunlight

Is the product marketable and developable?

Of course, this is perhaps the most prominent feature of the project through:

1. Make it waterproof
2. A generator that converts kinetic energy into electrical energy, so there will be no problem, whether in summer or winter, in order to generate energy.
3. Incorporating a system to measure pulse, heart rate, and blood pressure in order to monitor the person's health
4. Adding an application to the phone device that helps the person determine the distance of the sensor. Does it alert the wearer if he is two meters away?

The Heart–Brain Axis: Neurocardiac Communication, Autonomic Regulation, and Therapeutic Potential of Vagus Nerve Modulation

Rama Al Bustanji, Bayan Khaled Rababah, Seif Alkayid, Yara Abukhaled, Amir Majdi Moh'd, Abdeljalil El Hilali

Introduction:
The heart–brain axis is a bidirectional communication pathway that intimately connects the heart and brain. Rhythm, mood, stress, and cognition are all regulated by this dynamic interaction between autonomic, neurological, and immunological signals. Its significance in neurology and cardiology is underscored by the growing association of dysregulation of this axis with arrhythmias, stroke, depression, and cognitive decline.

Objective:
To map the anatomical and functional networks of the heart–brain and gut–heart–brain axes, emphasizing the intrinsic cardiac network, vagus nerve, and HRV as biomarkers.. The disputed idea of cellular memory and epigenetic adaptation are among the phenomena associated to transplants that are further examined. With a focus on neuroimaging data and verifiable perception in congenitally blind people, the work also explores notions of consciousness and near-death experiences. When evaluating the therapeutic potential of vagus nerve stimulation, it also promotes integrative neurocardiology in neurological and psychiatric care.

Methods:
An integrative narrative review was conducted to synthesize current evidence on the bidirectional relationship between the brain and heart. Relevant literature published between January and July 2025 was identified through searches of PubMed, Scopus, Web of Science, and Google Scholar. Approximately 600 records were screened for relevance, and 130 publications addressing brain–heart interactions were included in the final synthesis. Data were narratively synthesized and thematically organized across eight major categories, focusing on underlying mechanisms, key findings, clinical implications, and gaps in the current literature. The findings were further integrated using comparative tables and
conceptual figures to illustrate brain–heart pathways and their potential therapeutic implications.

Results:
Results indicate that the intrinsic cardiac neural system and the central autonomic network control cardiovascular function and affect emotional and mental states. With decreased variability linked to stress, inflammation, and elevated neurological risk, heart rate variability has become a valid indicator of neurocardiac health. Research suggests that neuroimmune regulation and neuromodulation (such as vagus nerve stimulation and HRV biofeedback) may help to improve outcomes and restore equilibrium in neurological and cardiovascular conditions.

Conclusion:
The heart-brain axis is an essential communication channel that connects neurological health and cardiovascular function. Its disturbance leads to serious clinical diseases, and its regulation may result in novel treatments. The prevention, diagnosis, and treatment of mood disorders, cognitive decline, and stroke may all be enhanced by incorporating neurocardiac processes into neurology

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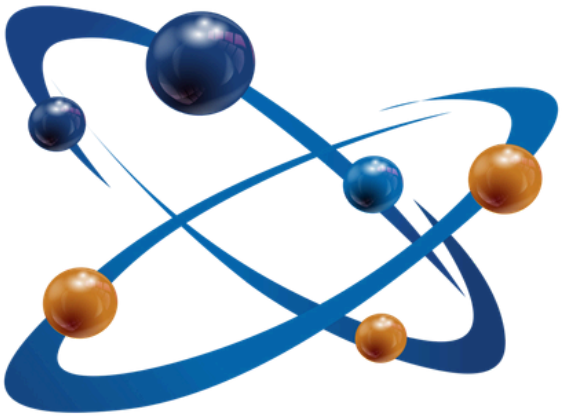


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