



msn

MANAGED SERVICE NETWORK
NEUROSURGERY



Annual Report

2024-25



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Foreword

It has been a year of ongoing change within the Managed Service Network (MSN) for Neurosurgery.

We are continuing to progress discussions with Public Health Scotland (PHS) to transfer the existing Consultant Dashboard to the Discovery platform to allow more efficient and effective reporting and work toward expanding the information available to consultants. We are discussing with Scottish Government to align our workstreams and reporting arrangements to national priorities and expand useful metrics to highlight neurosurgical activity and demand in Scotland.

A review of the MSN Governance Framework has provided assurance that the Network continues to provide a sustainable and valuable function. Discussions also continue around development of a Target Operating Model (TOM) for the MSN and the outcome from the Scottish Government Networks Review will also influence the direction and strategy of the Network including enhancing authority and accountability.

Our Allied Health Professional (AHP) and nursing subgroups continue to go from strength to strength with input through the Inter Regional Group (IRG). Two Bitesize Educational Sessions were very well received with further sessions planned for the coming year.

We have been challenged with meeting attendance across several of our groups. I am of the mindset that meetings should be useful and allow progression rather than simply going over old ground. Attendance at meetings is therefore vital as decisions cannot be made and views from across the country included without this. Without support and involvement in the MSN we have limited capacity to make our voices heard at a national level. If we want to influence change, your support is essential. Anyone wishing to be involved in the work of the MSN, please do get in touch.



Mr David Bennett
Consultant Neurosurgeon
National Clinical Director,
MSN for Neurosurgery



Executive Summary

Welcome to the Managed Service Network (MSN) for Neurosurgery **11th Annual Report, for the period 2024-25**. As a national collaborative Network, the MSN continues to support the planning and delivery of high-quality, person-centred neurosurgical services across Scotland. The past year has seen **strong engagement** from Health Boards, clinicians, analysts and partner organisations, enabling progress across a diverse programme of work.

Governance arrangements were strengthened this year, with endorsement of a draft TOM and updated Governance Framework, setting out clear strategic intent and a structure for transparency, accountability and future delivery.

These frameworks now provide the foundation for progressing service development, audit, and pathway improvement in a coordinated and evidence-led way. The Information Governance Framework was also strengthened through updated Data Protection Impact Assessments (DPIAs) and Data Processing Agreements (DPAs), supporting the safe management of patient data.

In parallel, key deliverables were agreed and set for development in 2024/25 — including a **Scottish Neurosurgery Outcome Indicators Report** to enable comparison with other UK nations, and the transition of PHS analytical services to a **sustainable in-house MSN model**. The Network also progressed the planned **migration of the Consultant Dashboard onto the Discovery platform**, improving accessibility, cost-effectiveness, and data visualisation capability.

Our national audits – **ARCO** (Annual Review of Consultant Outcomes) and **CAPNA** (Clinical Audit of Paediatric Neurosurgical Activity) – remain central to quality assurance and improvement. With continued collaboration with Public Health Scotland, the ARCO model is published in this annual report.

With national engagement in pathway redesign, audit refinement, the MSN continues to provide a strong platform for **collaborative improvement** in neurosurgical care. The year ahead will focus on developing the **newly agreed deliverables into active programmes** of work and strengthening the data and governance capabilities needed to support this.



MSN Board & Inter Regional Group



MSN Board

The Board of the Managed Service Network (MSN) for Neurosurgery is Chaired by Ross McGuffie (Chief Executive for NHS Forth Valley) and meets triennially.

The MSN Board provides national strategic leadership, and advises NHS provider and referring Health Boards, and other partners, in relation to the delivery of health and social care services in Neurosurgery. The MSN Board utilises audit and quality improvement initiatives and up-to-date evidence in line with strategic local, regional and national NHS priorities.



Inter Regional Group (IRG)

The Inter Regional Group, is Chaired by Sean Berryman (Clinical Service Manager, NHS Grampian) which meets bi-monthly.

The aim of the group is to work across geographical and organisational boundaries to support the planning, design and delivery of an integrated, holistic, person-centred care across provider and referring NHS Health Boards. The IRG reports to the MSN Board.

Deliverables






Governance and Structure

Deliverable 	Progress/Next Steps 	Benefits 
<p>Effectively manage the work plan of deliverables for the Network</p> <hr/> <p>Develop and implement a Target Operating Model (TOM) for the Network</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Deliverables progress reported through the MSN Board and IRG. <p>Next steps:</p> <ul style="list-style-type: none">• Maintain and progress deliverables as agreed. <hr/> <p>Achieved:</p> <ul style="list-style-type: none">• TOM draft proposal endorsed by the MSN Board.• Communication Plan drafted. <p>Next steps:</p> <ul style="list-style-type: none">• Open dialogue with the National Planning Board, to ensure the TOM is in line with National Networks Review• Progress TOM.	<p>Enabling the Network to prioritise, allocate resources aligned to capacity and manage interdependencies and provide an accountability to stakeholders on the delivery of the work plan within agreed time scales.</p> <hr/> <p>Defined governance, vision and mandate, supporting achievable objectives with clear benefits. Identifies gaps in neurosurgical service provision and revises MSN deliverables to facilitate service development. Guides improvements across clinical pathways, workforce, and technology.</p>

Deliverables



Governance and Structure

Deliverable 	Progress/Next Steps 	Benefits 
<p>MSN for Neurosurgery Governance Framework</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Completed – discussions with Scottish National Audit Programme (SNAP) no further actions. <p>Next steps:</p> <ul style="list-style-type: none">• Engage in the recommendations and actions when available from the Network review.• Delivery recommendations from the TOM when complete.	<ul style="list-style-type: none">• Provide a framework for effective MSN Board oversight, bringing authority and accountability to the Network, with performance and financial monitoring mechanisms in place.• Provide stakeholders with transparency on Network activity and reporting structures.
<p>MSN for Neurosurgery Information Governance Framework</p>	<p>Achieved:</p> <ul style="list-style-type: none">• DPIA and DPA.• Approved DPIA and DPA between NHS GGC and NHS Lothian complete. <p>Next steps:</p> <ul style="list-style-type: none">• Approval for DPIA and DPA between NHS Tayside and NHS Grampian.	<ul style="list-style-type: none">• Assurance that legislation is adhered to in the safe and effective management of patient information.• Safe and effective management of patient information across all sites• Increases collaboration across the Network.



Audit and Quality Improvement




The Managed Service Network for Neurosurgery performs two audits concurrently each year.

- The ARCO audit (Annual Review of Consultant Outcomes) is performed annually on routinely collected hospital Inpatient Discharge data. Automated data collection takes place via the standard Clinical Coding method for inpatient stays, and data is then linked nationally with other clinical databases by PHS (National Record of Scotland and the Cancer registry) to provide a complete patient record. This bank of data provides an opportunity for analytical parameters to be routinely audited, and Neurosurgical Clinical Standards to be measured against. Case ascertainment can be seen in appendix 1.
- The CAPNA audit (Clinical Audit of Paediatric Neurosurgical Activity) was derived from a requirement for the MSN Neurosurgery to compile a National Paediatric Operative Database to contain data for outcome measures for Neurosurgical inpatients under the age of 16. Categories of surgery are listed in appendix 2.

Deliverables



Audit & Quality Improvement

Deliverable 	Progress/Next Steps 	Benefits 
<p>Annual Review of Consultant Outcomes (ARCO) data analysis and reporting.</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Data submitted to PHS for case mix modelling. <p>Next steps:</p> <ul style="list-style-type: none">• Publish data on Consultant dashboard.• Review option of reducing audit instructions from 10% to 5%.	<p>Provides a structured, annual audit of consultant-level patient outcomes, with verified data on mortality rates. Presented by a case mix-adjusted model to account for variations. Highlighting any outliers leading to evidence led quality improvements.</p>
<p>Clinical Audit Paediatric Neurosurgical Activity (CAPNA) data analysis and reporting.</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Data collection complete for 2023-24.• Four regional databases merged into one to reflect regional transfers. <p>Next steps:</p> <ul style="list-style-type: none">• British Paediatric Neurosurgery Group (BPNG) and Category of surgery to be allocated.	<p>Ensures all paediatric procedures are performed by the appropriate provider neurosurgery Board. This encompasses all transfer of elective and emergency transfers between Health Boards.</p>

Deliverables






Audit & Quality Improvement

Deliverable 	Progress/Next Steps 	Benefits 
<p>MSN proposal with Public Health Scotland for data and analytical support.</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Proposal endorsed. <p>Next steps:</p> <ul style="list-style-type: none">• Develop delivery packages and agree costings.	<p>Provide routine access to relevant, timely and good quality data through an agile analytical service, and secure technical infrastructure that can be adaptable to changing requirements in the future.</p>
<p>Gain agreement with PHS to continue the Audit Review of Consultant Outcomes (ARCO)</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Agreement reached on continuing ARCO. <p>Next steps:</p> <ul style="list-style-type: none">• Case mix adjusted model to be produced and published.	<p>Securing agreement with Public Health Scotland ensures national consistency, data integrity, and sustainability of the ARCO audit.</p>
<p>Develop a Scottish Neurosurgery Outcome Indicators Report, enabling comparative analysis with England.</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Proposal submitted <p>Next steps:</p> <ul style="list-style-type: none">• Agree with PHS resources and costs.• Develop project plan to progress.	<p>Enabling meaningful comparison of national outcomes with England and other regions. This strengthens transparency, benchmarking, and drives local service improvement through data-informed insights into clinical practice and patient outcomes.</p>

Deliverables



Audit & Quality Improvement

Deliverable 	Progress/Next Steps 	Benefits 
<p>Transition of the current bespoke Neurosurgical consultant dashboard suite onto the routine Discovery platform.</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Agreement with Discovery to take forward. <p>Next steps:</p> <ul style="list-style-type: none">• Review of existing operational elements of the Consultant Dashboard to be transferred.• Scoping exercise of additional data and benefits.• Review Information Governance considerations.• Transition and migrate current functionality to Discovery.	<p>Migrating the Consultant Dashboard to the Discovery platform improves accessibility, ensures system sustainability, and reduces reliance on bespoke infrastructure. It offers enhanced reporting functionality, capacity savings, and scalability for future developments.</p>
<p>Support transition of PHS analytical services to In-house MSN Analytical functionality.</p>	<p>Achieved:</p> <ul style="list-style-type: none">• Proposal submitted <p>Next steps:</p> <ul style="list-style-type: none">• Identify appropriate skill set/ required for transition of PHS services to MSN in-house with appropriate governance and base for post.	<p>Transitioning analytical services in-house increases agility, improves responsiveness to Network needs, and ensures sustainable access to high-quality, timely data.</p>

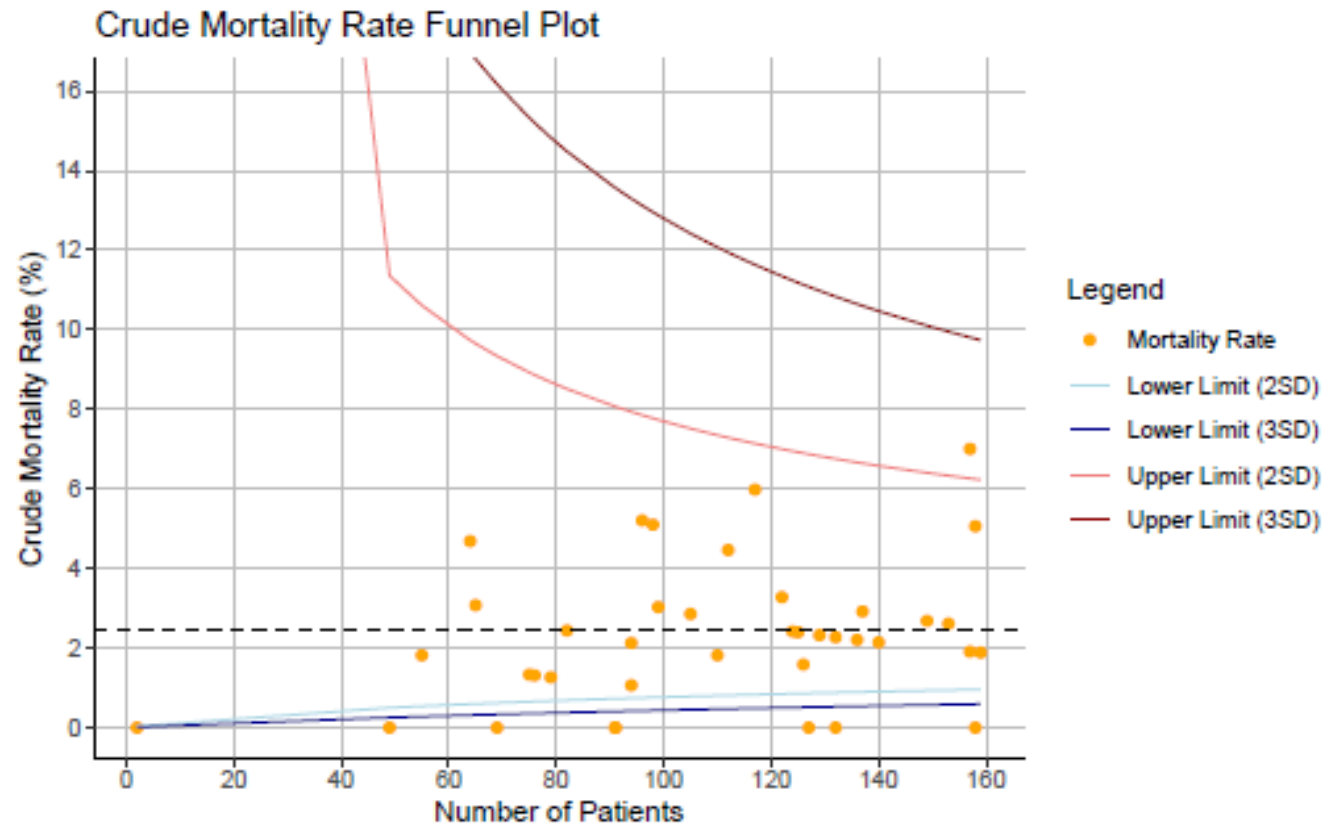


Annual Review of Consultant Outcomes

Deaths Within 30-days of Last Procedure (1 April 2023 - 31 March 2024)

Crude Mortality Rate (%)

Funnel Plot





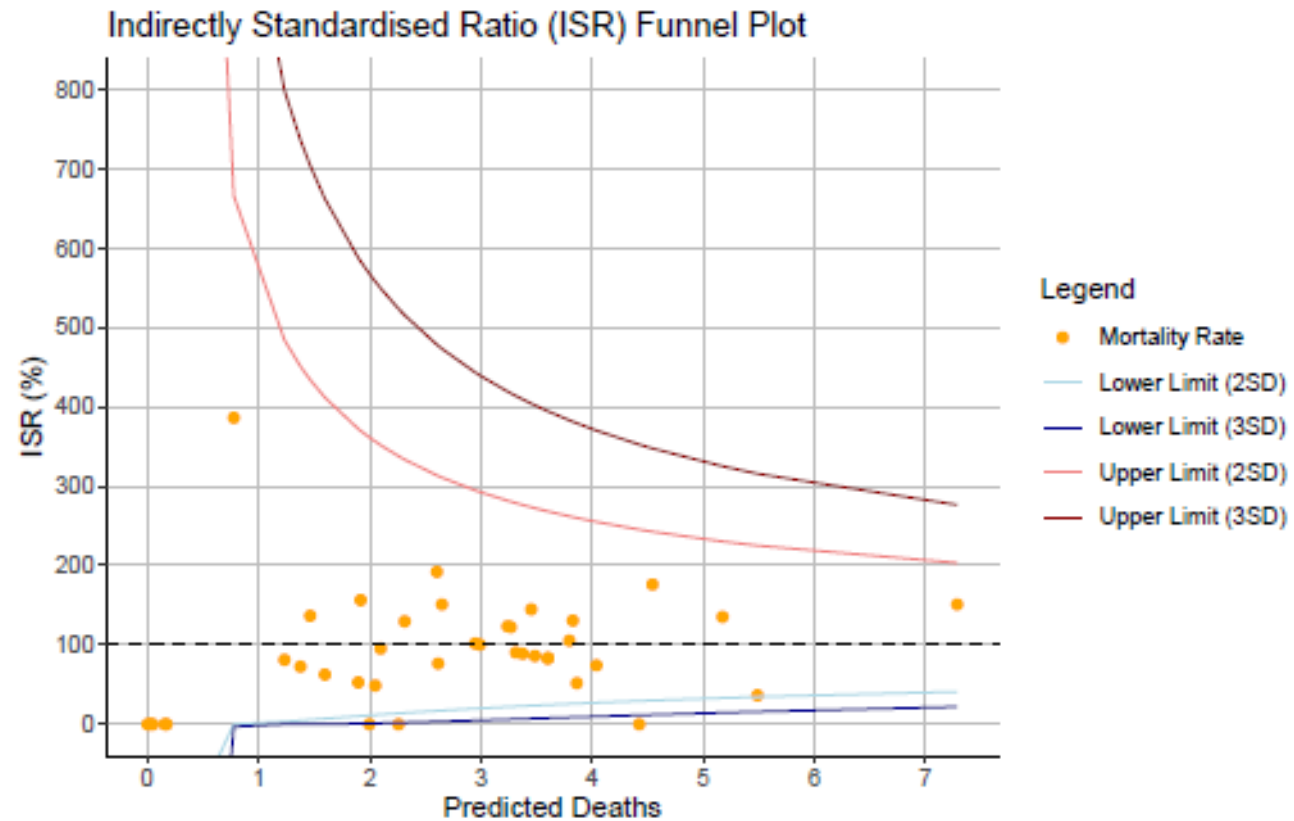
Deaths Within 30-days of Last Procedure (1 April 2023 - 31 March 2024)

Standardised Mortality Ratio (SMR)

Following validation, data is entered into a bespoke case mix adjustment tool that accounts for confounding variables which impact on each case.

Using this tool the funnel plot generated shows the position of each consultant in relation to the Scottish normal, and shows that there are no outliers.

Funnel Plot





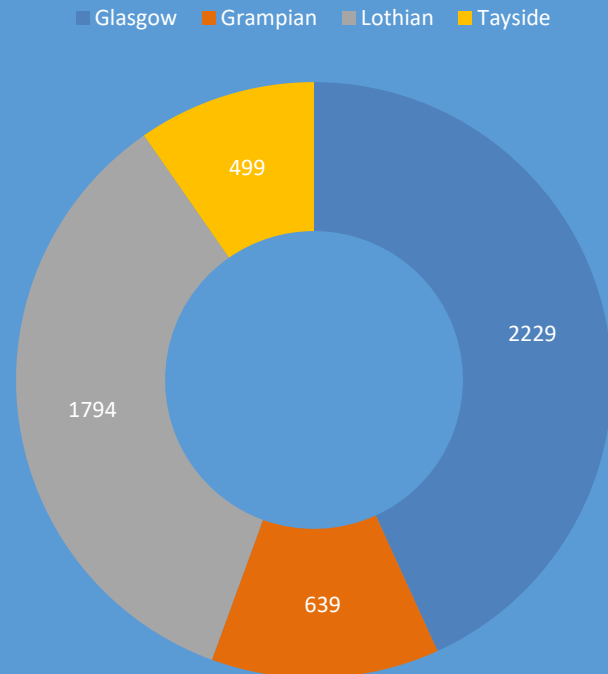
Clinical Audit of Paediatric Neurosurgical Activity (CAPNA) (April 2023 to March 2024)

Region	Year	Surgeries	Category 1	Category 2	Category 3	Transfers Out	In Patient Deaths
Tayside	2023/24	5	5	0	0	12	0
	2022/23	4	4	0	0	15	1
Grampian	2023/24	4	4	0	0	13	0
	2022/23	5	5	0	0	30	0
Lothian	2023/24	193	2	26	165	1	1
	2022/23	182	90	19	73	0	0
GG&C	2023/24	442	40	27	375	2	0
	2022/23	333	22	21	290	0	2

This table presents data for 2023/24, with figures for 2022/23 included for comparison. For a breakdown of category of surgery, refer to Appendix 2.



Audit and Quality Improvement



Number of Cases Performed by Provider Health Board April 2023 – March 2024.

There were over 5000 surgical cases performed on 4611 patients by 38 Neurosurgeons between April 2023 and March 2024. All deaths within 30 days of surgery, and an additional random 10% of cases were audited. Each Consultant was audited individually due to the diversity of their surgical skillset.

Deliverables



Standards & Pathways

Deliverable

Identify and develop audit instructions and quality improvement processes, aligned with revised **Neurosurgical Clinical Standards**

A review and update of the following **National pathways:**
Cauda Equina Syndrome (CES),
 Traumatic Brain Injury, Sub-Arachnoid Haemorrhage (SAH),
 and Brain Tumour

Progress/Next Steps

- Achieved:**
- **Service Audit completed, published with recommendations.**
- Next steps:**
- **Progress recommendations.**
 - **Develop audit instructions for Clinical Standards – Phase 2.**

- Achieved:**
- **Agreement to review CES pathway initially**
 - **Short life working group set up and met in June 2024**
- Next steps:**
- **CES audit findings to be presented to Clinical Service Managers, with further analysis to be agreed.**

Benefits

Provide the ability for clinical teams, to identify an issue and implement quality improvements to interventions resulting in; efficiencies of practice, improvements in patient care and patient satisfaction.

- Improved patient outcomes and a reduction in hospital admission duration.
- Defined resources and personnel required to offer specific services, audit structure, enable collaborative working between units.

Deliverables



Nurses Working Group

Deliverable



Training and Education Needs Analysis (TNA)

Progress/Next Steps



Achieved:

- **Data analysis report published with recommendations.**

Next steps:

- **Recommendations to be actioned.**
- **Repeat Lothian TNA following recruitment drive.**

Benefits



A comprehensive insight into the national training and development needs of staff working in Neurosurgery.

Patient Acuity Audit – to identify if acuity trends have increased in neurosurgery patient cases.

Achieved:

- **Initial scoping exercise and benefit agreed.**

Next steps:

- **Audit Instructions and data collection to be taken forward.**
- **Outcomes and Recommendation report.**

- Providing insights into the complexity and urgency of patient care.
- Supports safer staff models, and enhances decision-making around workforce planning.
- Ensuring the right level of care is delivered at the right time.
- Improved patient outcomes and increased staff satisfaction.

Deliverables



Allied Health Professionals Working Group

Deliverable



Review by sub speciality AHP pathways, covering; Occupational Therapy, Speech and Language Therapy, Physiotherapy Generic and Physiotherapy Spinal Surgery, and Neurosurgery Dietetic.

Deliver **Bitesize educational sessions** on key AHP themes.

Progress/Next Steps



Achieved:

- **A compilation of current pathways.**
- **Review of pathways has been successful, now pending.**

Next steps:

- **Each service to seek endorsement after consultation with the subspecialties.**
- **An audit plan is to be developed following this sign off process.**

Achieved:

- **Delivered two Bitesize sessions:**
- **Speech and Language Therapy for Neurosurgical Patients**
- **Physiotherapy in a Critical Care setting**

Next steps:

- **Plan and deliver 2-3 sessions throughout 2025/26.**

Benefits



To improve quality of care, effectiveness and productivity across care pathways.

- To develop collaboration, innovation, and best practice among AHPs nationally.
- Support consistent, high-quality care.
- Strengthen the understanding of AHPs' importance in delivering patient-centred pathways and supporting national healthcare objectives.



Research & Innovation

Encouraging the proliferation of clinical-research is within the Network remit, with known outcomes of research rich clinical areas delivering better outcomes for patients.

A Neurosurgical Project Springboard took place in October 2024 with projects from Aberdeen being shared with the national group:

- Service Improvement for Suspected Cauda Equina Syndrome referral pathway in resource limited centres - A focused study done in Western Isles Hospital
- Malignant Spinal Cord Compression in Scotland: M1S2C3
- Research Proposal: Development of a Standardised Scoring System for Radiological Investigation in Suspected Cauda Equina Syndrome

All presentations had feedback provided as part of an open discussion. With consideration of best practice, the meeting was delivered successfully, the outcome was a multi-disciplinary and inclusive meeting of Neurosurgery staff with a mix of experience in Clinical Research.

Deliverables



Research & innovation

Deliverable 	Progress/Next Steps 	Benefits 
Provide support to Neurosurgical Regional Data Requests	Achieved: <ul style="list-style-type: none">• Data requests received acted upon. Next steps: <ul style="list-style-type: none">• Continuing monitoring• Advertise availability of collaboration.	Optimising Neurosurgical care outcomes through Research and Innovation.
Development of prospective Neurosurgical Projects	Achieved: <ul style="list-style-type: none">• Identified clinical coding project for pituitary tumors. Next steps: <ul style="list-style-type: none">• Develop audit plan, establish local and national workflows.	Improvements in Neurosurgical practice, governance, and development of national working, standardising lower volume surgery improvements.
Provide opportunities for stakeholder-driven research and innovation	Achieved: <ul style="list-style-type: none">• Autumn Neurosurgery Project Springboard meeting. Next steps <ul style="list-style-type: none">• Encourage proliferation of individual projects.	Professional development of clinicians at all levels, innovation in care delivery.



MSN for Neurosurgery Team



Ross McGuffie
Chairman, MSN for Neurosurgery
CEO, NHS Forth Valley



David Bennett
National Clinical Director



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Acknowledgments

The MSN for Neurosurgery extends its sincere thanks to the individuals and teams who have contributed to this year's achievements:

Outgoing Board Chair, **Gary Jenkins** – for his leadership and longstanding support.

Niko Triantafillou and **Neeta Patel** – for their commitment and valued contributions to the Network.

New colleagues, including **Professor Ross McGuffie** (Board Chair), **Jen McGregor** (Project Support Officer), **Rachel Murphy** (Audit Facilitator), and **Sarah Murray** (Chair of AHP Working Group)

All **clinical, managerial, and analytical teams** across Scotland who continue to contribute time, data, and insight to the Network's deliverables.

Public Health Scotland and other key national partners for their collaborative support in advancing audit, data quality, and outcomes reporting.



ARCO audit (Annual Review of Consultant Outcomes)

Case Ascertainment

- All Neurosurgical procedures listed in the MSN Neurosurgical OPCS Coding document, that take place as an inpatient, in an operating theatre within a Scottish Neurosurgical centre.
- All procedures carried out by a Neurosurgeon, including those carried out as a joint procedure with another specialty, or by a Neurosurgical registrar.
- All neurosurgical procedures carried out in the year to be validated, regardless of date of admission.
- All deaths within 30 days of an operation

10% of the remaining cases to be audited, not including 'day cases' or those cases where there is no index neurosurgery procedure.



Clinical Audit of Paediatric Neurosurgical Activity (CAPNA)

Categories of Surgery Definitions - Category 1

All four units should be able to provide care for paediatric patients requiring emergent neurosurgical intervention. This should be provided by any on-call neurosurgical consultant and would include any case where there is significant life-threatening risk of deterioration such that transfer to a dedicated paediatric neurosurgical unit would be unsafe.

Patients requiring paediatric intensive care following emergency surgery will be referred to the neurosurgical and critical care teams in either NHS Lothian or NHS Greater Glasgow & Clyde.

Interventions include:

Immediate surgical management of life-threatening acutely raised ICP from an expanding haematoma or acute hydrocephalus from shunt malfunction e.g.

- craniotomy for trauma and evacuation of intracranial haematoma.
- decompressive craniectomy (consideration should be given to the benefits of pre-operative transfer. after discussion with colleagues in NHS Lothian or NHS GG&C).
- revision of ventriculoperitoneal shunt.
- placement of an external ventricular drain.



Clinical Audit of Paediatric Neurosurgical Activity (CAPNA)

Categories of Surgery Definitions - Category 2

The units in NHS Grampian and NHS Tayside should provide elective or urgent surgery by a neurosurgeon with a paediatric interest. Consideration should be given to the benefits of discussion with colleagues in NHS Lothian or NHS GG&C and potential pre-operative transfer.

The conditions treated and surgery itself cannot rely on the availability of 24/7 paediatric neurosurgery or ventilation in PICU but may involve observation in the local HDU.

In all situations, consideration should be given to option of pre-operative transfer to NHS Lothian or NHS GG&C if required.

Interventions could include:

- management of myelomeningocele.
- baclofen pumps in teenagers (NHS Tayside)
- Chiari malformation in teenage patients without syrinx, scoliosis, spinal dysraphism, hydrocephalus or other associated pathology.
- vagal nerve stimulation (VNS) in teenagers (NHS Tayside)
- denovo Ventriculoperitoneal shunt insertion in non-complex hydrocephalus.
- repair of depressed skull fracture in a stable teenage patient.
- endoscopic third ventriculostomy in teenage non-complex hydrocephalus.



Clinical Audit of Paediatric Neurosurgical Activity (CAPNA)

Categories of Surgery Definitions - Category 3

There are cases that should always be referred to specialist services in NHS GG&C or NHS Lothian.

Interventions would include:

- neonatal intraventricular haemorrhage (IVH) management.
- neuro-oncology cranial and spinal cases up to the age of 16.
- vascular cases.
- craniofacial and craniosynostosis surgery including growing skull fracture.
- intervention for congenital malformations.
- epilepsy surgery.
- selective dorsal rhizotomy.
- complex dysraphic syndromes with tethering.
- rare complex patients such as Morquio syndrome, NF2, etc.
- the complex hydrocephalus patients (may flit between categories 1, 2 and 3 depending on their presentation)
- complex anomalies at the craniocervical junction.
- spinal trauma cases requiring operative consideration.
- lumbar disc herniation in patients aged under 16.



If you would like to find out more about MSN for Neurosurgery, please contact the team on MSNNeuro@lanarkshire.scot.nhs.uk or visit www.msn-neuro.nhs.scot