Manual Lectures
Blended Frontal Lectures: An Interactive, International Teaching Model

To further enrich the project's educational resources and ensure standardisation and replicability across institutions, the *Neuro(de)cision* consortium will produce a comprehensive **Manual for the Delivery and Evaluation of Frontal Lectures**, based on the successful 2024 pilot **Neurosurgical Frontal Lecture Series**. This manual will guide academic and clinical faculty in the planning, delivery, and evaluation of **blended frontal lectures**, combining in-person and synchronous online sessions led by expert faculty from the four project partners.

The lecture series is designed to engage **senior medical students interested in neurosurgery** through an international, interdisciplinary format. Each lecture is delivered by **opinion leaders from the partner institutions**—Humanitas University (Italy), INI Hannover (Germany), University of Belgrade (Serbia), and H. Lusíadas (Portugal)—sharing their expertise in a specific neurosurgical domain. Students participate either in person or synchronously online, with active learning elements such as case discussions, Q&A sessions, and interactive polling tools embedded into each session.

The format ensures flexibility, inclusiveness, and a **rich educational experience**, leveraging transnational faculty collaboration to introduce students to varying clinical approaches and academic cultures.

Educational Impact Assessment and Methodology

Each lecture follows a standardised assessment protocol:

- **Pre-Test:** Administered before the session to evaluate baseline knowledge.
- **Post-Test:** Conducted immediately after the session to measure learning gains.
- **Statistical Analysis:** Paired pre- and post-test data are analysed using statistical methods (significance level $\alpha = 0.05$), primarily through p-value comparison. For broader evaluation, Fisher's combined probability test is applied to assess cumulative impact across the series.

- **Anonymous Student Satisfaction Survey:** Administered post-lecture to evaluate:
    - Clarity and relevance of the lecture
    - Teaching and engagement quality
    - Satisfaction with format (hybrid, interactivity)
    - Willingness to attend future sessions
    - Suggestions for improvement

This evaluation framework is designed to **ensure both academic rigor and student-centred feedback**.

The lecture series conducted across four partner sites demonstrated the model's feasibility and impact. Four lectures were delivered:

1. **Spinal Cord Pathologies** (H. Lusíadas, Porto, Oct 10, 2024)
2. **Neurosurgical Emergencies** (Humanitas, Milan, Oct 17, 2024)
3. **Functional and Peripheral Nerve Surgery** (University of Belgrade, Nov 6, 2024)
4. **Neuro-oncology** (INI Hannover, Dec 5, 2024)

The results of all four lectures **combined using Fisher's combined probability test** showed the **overall p-value was 0.00241**, indicating a **statistically significant educational impact across the lecture series**.

This meta-analytic result supports the effectiveness of the lecture series as a **cohesive educational tool** that enhances student understanding of core neurosurgical concepts, even when individual lectures vary in impact.

Manual Objectives and Content

The upcoming manual will formalize and standardize this approach. It will include:

- **Technical instructions** for hybrid delivery
- **Templates** for lesson plans, pre-/post-tests, surveys
- **Evaluation protocols** and guidelines for interpreting statistical outcomes
- **Best practices** for involving expert speakers and fostering interactivity

- **Case studies** and lessons learned from the 2024 pilot series

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Sustainability and Broader Application

The manual will ensure the **replicability and scalability** of the frontal lecture model in other institutions and across other high-demanding medical specialties, such as oncology, emergency medicine, anesthesiology, and intensive care—fields also facing high dropout rates and requiring early, structured exposure and mentorship.

By integrating this manual into the broader *Neuro(de)cision* methodology, the project will strengthen its core impact: providing an **evidence-based, student-centered, and internationally connected mentorship model** for medical students navigating career-defining choices in demanding specialties.

The manual will be shared across partner institutions, included in future project proposals, and made publicly available as part of the project's commitment to **open access and educational innovation**