

QUALITY INDICATORS IN NEURO-ONCOLOGY

Assessing Quality of Care
through process and
outcome indicators for
glioma patients in the
Belgian hospitals

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Introduction

Gliomas

- A glioma is an intrinsic central nervous system tumour arising from glial cells, which protect and support neurons.
- In Belgium, about 750 people are diagnosed with a glioma annually.
- Glioblastoma, the most frequent form is highly malignant. The 2-year survival is about 20% following resection, radiation and chemotherapy.

Quality Indicators (QIs)

- QIs are measurable aspects of care performance for which there is evidence or consensus that they can be used to assess quality (acc. to Lawrence and Olesen).
- QIs provide insight into patterns of care and outcomes, enabling the identification of areas where quality improvement is needed.
- Process indicators assess various phases of the care cycle (diagnosis, imaging, treatment, follow-up), while outcome indicators evaluate endpoints such as 30-day post-treatment mortality or survival.

Belgian Cancer Registry (BCR)

- In Belgium, hospitals are required to register all newly diagnosed cancers to the BCR.
- The BCR is not only legally charged with the collection of all cancer related data, but also with its quality control, coding, analysis, protection, and reporting.
- The BCR is an indispensable partner in conducting cancer-related research at the population level.

The aim of this thesis is, first, to develop, describe and calculate Quality Indicators related to the care trajectory of adult glioma patients in Belgium, both at population and hospital level, and second, explore possible correlations between indicator results and hospital volumes.

Promotors

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Prof. Dr. Jo Van Dorpe (*Department of Pathology, Ghent University Hospital*)

Methodology and Research Steps

The methodology closely followed the approach used by the KCE (Belgian Health Care Knowledge Centre) in its reports on QIs in other oncological domains:

1. A **systematic literature review** was conducted to inventory QIs and guidelines related to the diagnosis, surgical and adjuvant treatments, and follow-up of gliomas.
2. Through a **Delphi consensus survey** among a Belgian multi-disciplinary expert panel, a shortlist of 47 QIs was established.
3. **Operationalisation of QIs**: assessment of measurability and creation of **Technical Documentation Sheets** detailing all necessary data elements required for the calculation of measurable QIs.
4. A **target population** was identified for whom data from the BCR were linked with administrative databases: glioma patients diagnosed in Belgium between 2016 and 2019.
5. Based on developed **hospital allocation algorithms**, all glioma cases were assigned to one centre per indicator.
6. A **validation study** in 6 pilot hospitals crosschecked the administrative data with data items in the hospitals' medical files and validated the algorithms used to identify medical procedures.
7. A **final calculation** of 25 measurable QIs was performed and results were presented at both national and hospital level. All hospitals involved in glioma diagnosis and treatment received **individual feedback**.

Results

Overall, the results for indicators on diagnosis and imaging were positive and largely aligned with predefined targets, though some areas for improvement were identified. For the indicators on

treatment, again qualitative care was identified. However, the timely initiation of adjuvant treatment in high-grade glioma could be improved. Additionally, several limitations in administrative data were noted, such as the inability to assess radiotherapy dose and number of fractions, as well as the lack of information on surgical outcomes, including extent of resection and neurological status. Two outcome indicators were also calculated. The 30-day mortality rates following resection and biopsy exceeded predefined targets, though no association with hospital volume was found. Higher mortality rates after biopsy were observed in elderly patients and in those with poorer WHO-scores. The 1- and 2-year survival probabilities of glioblastoma following either resection or biopsy were consistent with international benchmarks. However, significant differences were observed depending on hospital case load. As part of this research was conducted during the COVID-19 pandemic, the impact of the pandemic on the incidence and observed survival of malignant brain tumours in Belgium was also analysed.

Conclusion

This first calculation should not be used to criticise individual hospitals but serves as a starting point. It highlights gaps in clinical practice and presents opportunities for quality enhancement, while also providing motivation for physicians and hospitals already performing well. Achieving further quality improvements will require a collaborative effort from neuro-oncology specialists, hospitals, health care administrators, and policy makers in Belgium. On an international level, increasing awareness of quality assessment in neuro-oncology, and harmonising applied indicators, could enhance benchmarking possibilities in the future.

Curriculum vitae

Dimitri Vanhauwaert graduated as medical doctor from UGent in 2002 and became a board-certified neurosurgeon in 2008. Since then, he has been a staff neurosurgeon at AZ Delta Roeselare (formerly Heilig Hart Roeselare) and consultant neurosurgeon at Jan Yperman Ziekenhuis in Leper and Sint-Andriesziekenhuis in Tielt. He serves as a resident training supervisor since 2016.

He is also board member of the Belgian Society of Neurosurgery (BSN), and member of the European Association of Neurosurgical Societies (EANS), the European Association of Neuro-Oncology (EANO), and an International Fellow of the American Association of Neurological Surgeons (IFAANS). He was recently appointed to the Flemish Accreditation Board for Neurosurgery.

Since October 2024, he is academic consultant at the Department of Human Structure and Repair.

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