The overlooked need for modelling beyond reimbursement to support therapy uptake: Case study of botulinum toxin for spasticity treatment

EE719

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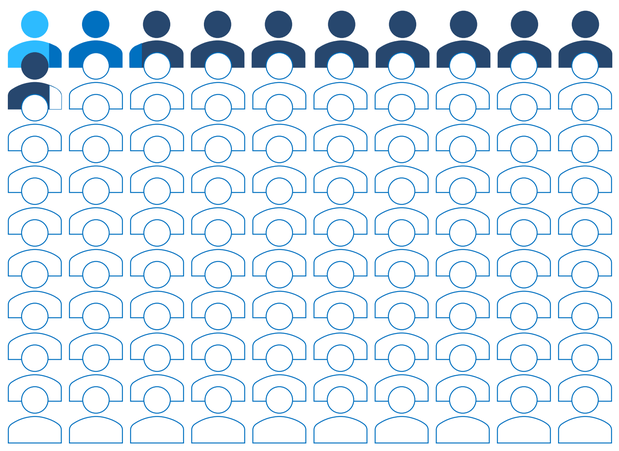
INTRODUCTION

Botulinum toxin (BoNT) is an effective treatment for focal spasticity and is indicated for post-stroke population.[1]

- Despite proven efficacy, few eligible patients receive BoNT treatment.[2]
- BoNT underuse contributes to avoidable healthcare resource use, reduced patient quality of life and an increased caregiver burden.[3,4]
- It is hypothesised that limited uptake is due to clinicians, hospital administrators, policy makers and patients underestimating or being unaware of the clinical and economic value of BoNT for focal spasticity management.
- Therefore, we aimed to assess how economic modelling has been used to generate evidence to support BoNT uptake.

Figure 1: Proportion of stroke patients who receive BoNT[2]



10.7% of stroke patients exhibit post-stroke spasticity

2.3% of patients receive ≥1 dose of BoNT

<0.8% of patients receive ≥3 dose of BoNT [a] in a 12-month window

Abbreviations: BoNT, botulinum toxin

METHODS

- A systematised literature review was conducted to identify economic models and data published between 2010 and 2025 and answer the following questions:
  - Which model structures have been used in this disease area in the past?
  - What other economic data on the impact of spasticity are available?
- A literature search was conducted on 28.02.2025 and title/abstract and full-text screening were performed using pre-defined inclusion and exclusion criteria.
  - We also searched country-level guidelines to understand what treatments and treatment pathways are recommended for spasticity.
- Modelling, economic and clinical data were extracted and analysed. Findings were grouped by question, model structure and data category.

RESULTS

- The review identified 51 relevant records, including 25 economic models, 22 economic reports and 4 country-level guidelines.
- Among the 25 models, 11 compared BoNT with standard of care (SoC), the remainder used alternative comparators (Figure 2A).
- The 11 identified models that compared BoNT to SoC focused exclusively on cost outcomes (Figure 2B).
- Indirect costs were rarely considered; over half of the models (n=6) excluded them entirely; just two models considered more than one indirect cost (Figure 2C).
- Beyond indirect costs, only 3 of the 11 models considered a societal perspective (Figure 2D).
- Existing models were limited by data availability and often used outdated or sub-optimally suitable inputs.

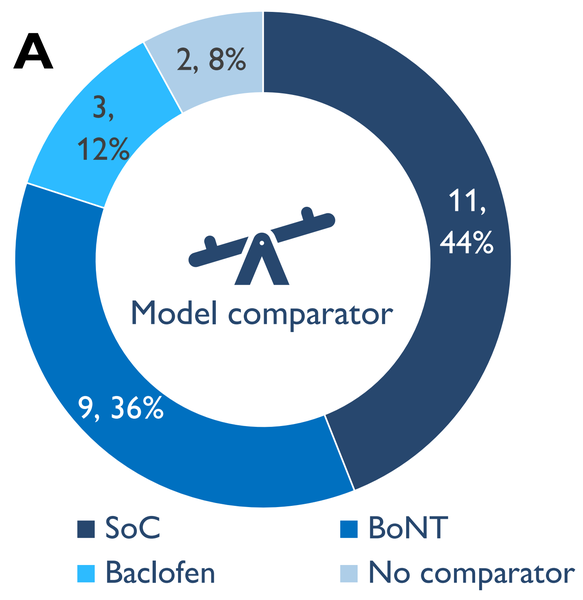


Figure 2: Findings of the review

A: Type of model comparator by record (n, %)

B: SoC model type (n, %)

C: Proportion of SoC models that consider common direct and indirect cost categories (n=11)

D: Model perspective (n, %)

Abbreviations: BoNT, botulinum toxin; HCP, healthcare professional; SoC, standard of care

DISCUSSION

- We found that most BoNT-centred models addressed reimbursement decisions, emphasising improved cost outcomes for payers, but did not consider societal impacts such as productivity loss, caregiver burden and out-of-pocket patient spending.
- Models also did not consider other factors beyond reimbursement that wider BoNT uptake is contingent on, such as greater specialist healthcare provider training to increase the number of qualified injectors and an improved referral process.
- Therefore, there remains a clear need for expanded modelling that captures the effect of treatment implementation beyond reimbursement.
- Such analysis would help address existing uptake barriers and highlight the societal impact of using less efficacious treatment alternatives.
- Addressing these evidence gaps can support engagement with critical non-payer stakeholders, inform policy decisions and ultimately, improve patient outcomes.

CONCLUSION

- This review found that existing BoNT economic models are heavily focused on direct cost outcomes, with limited consideration of broader societal impact such as caregiver burden and productivity loss.
- These findings highlight an important evidence gap for future BoNT models to address and point to a wider opportunity for the industry to adopt more comprehensive modelling strategies.
- Improved modelling would better represent real-world societal impact and value beyond reimbursement, better informing critical stakeholder decision-making and ultimately improving patient outcomes.

Abbreviations: BoNT, botulinum toxin; HCP, healthcare professional; SoC, standard of care.

Footnotes: [a] recommended dosing interval is 12 weeks (3-monthly interval) for upper limb spasticity[5]

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References: [1] Royal College of Physicians et al., (2018) Spasticity in adults: management using botulinum toxin. National guidelines [Accessed September 2025], available at: https://www.rcp.ac.uk/media/i1ijs0tm/spasticity-in-adults_final-version_march-2019.pdf [2] Levy J et al. Front Neurol. 2023;14:1245228. doi: 10.3389/fneur.2023.1245228 [3] Esquenazi A et al. J Rehabil Med. 2023;55:jrm11626. doi:10.2340/jrm.v55.11626 [4] Bhakta BB et al. J Neurol Neurosurg Psychiatry. 2000;69(2):217-221. doi:10.1136/jnnp.69.2.21 [5] Xeomin prescribing information [Accessed September 2025]. Available at https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/125360s073lbl.pdf