

Keele Critically Appraised Topic (CAT Form)



Clinical Question

Are regular botulinum toxin injections effective to improve function and decrease pain for adults with learning disabilities who have hamstrings spasticity issues?

Clinical bottom line

At the present time, there is no research available to answer this clinical question. More research is required within this specialist field to enable recommendations for clinical practice. This CAT question could be used as the foundation to write a research proposal.

Plain Language Summary

People with learning disabilities might feel pain when their leg muscles are tight. This can make it hard for them to do normal things each day, to sleep well, or stay clean. If their legs stay stiff for a long time, it can make sitting or lying down difficult. Sometimes, this can lead to serious problems or even early death.

Doctors can use special injections called botulinum toxin to help with the pain and muscle tightness. We don't know if these injections work well for people with learning disabilities to make their pain better or help them do daily tasks.

More studies are needed to find out how helpful this treatment is.

Why is this important?

In England, an estimated 1.3 million people have a Learning Disability (LD); with the severity of symptoms classified as mild, moderate, severe or profound (Office for Health Improvement and Disparities, 2025). People with profound and multiple learning disabilities are particularly at risk of developing distorted body shapes, because they often spend their lives in a limited number of positions, are unable to change position independently (Public Health England, 2018) or clearly communicate their postural care needs (Doukas et al., 2018); therefore, they are predisposed to hamstring issues, particularly if spasticity is present. Spasticity is defined as 'increased resistance to muscle stretch experienced by a clinician attempting to flex or extend a limb in some patients with upper motor neuron lesions.' (Lance, 1980 p1308).

One of the lead roles of a specialist LD Physiotherapy service is to provide 24-hour postural management (Bruce and Standley, 2019). The therapist assesses and treats a patient's posture using specialist skills and may refer on for adjunct treatments, such as wheelchair

services, orthotics or bespoke input from spasticity management specialists. Overall, it has been reported by Barnes (1998), that the clinical management of spasticity requires the involvement of a comprehensive rehabilitation team.

Working within a Physiotherapy Team in the Midlands, it has been observed that patients accessing our services, experience varying botulinum toxin injection treatment options for hamstring spasticity. Some patients have been refused access to this treatment option all together, others were eligible but required to wait two years for subsequent follow up, while some were able to access regular 12 weekly injections.

If local intramuscular injection of botulinum toxin is used in accordance with national guidance produced by the Royal College of Physicians (2018), it has the potential to reduce lower limb pain, prevent contractures and enhance passive as well as active function, which will also directly impact on the reduction of ongoing care costs (Ashford et al., 2016).

In spite of this evidence, at the present time, the National Institute for Health and Care Excellence (NICE), are yet to formally recommend botulinum toxin injections specifically for adults with an LD, who have hamstrings spasticity issues, although botulinum toxin clinical guidance has been produced for addressing spasticity issues in under 19's (CG145) (NICE, 2016) and adults with Cerebral Palsy (NG119) (NICE, 2019). The NICE guidance recommends the consideration of botulinum toxin treatment when spasticity of a patients lower limb's has resulted in: increased pain, care and hygiene difficulties, disturbed sleep, impaired daily activity or where spasticity is impacting on a patient's tolerance to access other potential treatments options, for example: orthotic input or the ability to access posture enhancing equipment, such as specialist wheelchairs, standing frames, or walkers, etc. (NICE, 2016, NICE, 2019). Access to botulinum toxin injections for LD patients is, therefore, recommended for people with the symptoms described above.

It is anticipated that without access to regular botulinum toxin injections, to support LD Physiotherapy provision, patient's will experience difficulty achieving their treatment goals (NICE, 2019); they could potentially develop significant health conditions which have been shown in some cases to lead to premature death (Mencap, 2025). A review of the current literature to answer this clinical question was, therefore, deemed important.

Search timeframe

2003 to present

Ovid MEDLINE(R) ALL <1946 to November 22, 2024>

Embase <1974 to 2024 November 22>

Ovid Emcare <1995 to 2024 Week 46>

EBSCO CINAHL 1938 to November 22, 2024

ProQuest PsycInfo 1967 to November 22, 2024

TRIP Database 1997 to November 22, 2024

PubMed 1947 to November 22, 2024

Search criteria

Population Intervention Comparison Outcomes (PICO) themes	Description	Search terms
Population and setting	Adults >18years with learning disabilities and spasticity issues	<p>spasticity</p> <p>AND</p> <p>hamstring</p> <p>AND</p> <p>"learning disabilities" OR intellectual disabilit* OR intellectual disabilities OR learning disabilit* OR intellectual disab* OR learning disab*</p> <p><i>(the asterisk allows for plurals and variations at the end of the word)</i></p> <p><i>(title, abstract or keyword were searched)</i></p> <p>Subject Headings were also used:</p> <p>Muscle Spasticity (exploded (widened) subject heading in Ovid Medline)</p> <p>"Muscle Spasticity" (main subject heading in EBSCO CINAHL)</p> <p>Hamstring Muscle (exploded (widened) subject heading in Ovid Embase)</p> <p>"Intellectual Disability+" (main subject heading, exploded (widened), in EBSCO CINAHL)</p> <p>"Persons with Intellectual Disabilities" (main subject heading in EBSCO CINAHL)</p>

		<p>"Learning Disorders" (main subject heading in EBSCO CINAHL)</p> <p>Intellectual Disability (exploded (widened) subject heading in Ovid Medline)</p> <p>Intellectual Impairment (exploded (widened) subject heading in Ovid Embase and in Ovid Emcare)</p> <p>Learning Disabilities (Ovid Medline subject heading)</p> <p>Learning Disorder (Ovid Embase subject heading)</p> <p>"Intellectual Development Disorder" (main subject exploded (widened) term in ProQuest PsycInfo)</p> <p>"Learning Disabilities" (main subject exploded (widened) term in ProQuest PsycInfo)</p>
Intervention or Exposure	Botulinum Injections	<p>"botulinum toxin injections" OR botox injections OR botulinum injections OR botulinum toxin injection OR botox injection OR botox OR botulinum toxin OR botulinum toxin injection* OR botox injection*</p> <p><i>(the asterisk allows for plurals and variations at the end of the word)</i></p> <p><i>(title, abstract or keyword were searched)</i></p> <p>Subject Headings were also used:</p> <p>Botulinum Toxins, Type A (exploded (widened) subject heading in Ovid Medline)</p>

		<p>Botulinum Toxins (exploded (widened) subject heading in Ovid Medline)</p> <p>Botulinum Toxin A (exploded (widened) subject heading in Ovid Emcare)</p> <p>Botulinum Toxin (exploded (widened) subject heading in Ovid Embase and Ovid Emcare)</p> <p>"Botulinum Toxins" (main subject heading in EBSCO CINAHL)</p> <p>"Botulinum Toxin" (main subject exploded (widened) term in ProQuest PsycInfo)</p>
Comparison, if any e.g. usual care, leaflet	Usual intervention / no intervention/ Oral anti-spasticity agents as part of usual care	No searches applied - any comparison considered, due to low number in the population and intervention results.
Outcomes of interest	<p>Functional measures including posture/positioning</p> <p>Abbey pain Scale</p> <p>Goal attainment Score</p> <p>Rivermead Mobility Index</p> <p>Barthel ADL Index</p> <p>Therapy Outcome measures</p> <p>Quality measures e.g. EQ5D</p>	No searches applied - any comparison considered, due to low number in the Population and Intervention results.
Types of studies	All	All considered

Databases searched

EBSCOhost CINAHL Ultimate

Ovid Embase

Ovid Emcare

Ovid Medline

TRIP Database

PubMed

Date of search
25th November 2024

Results of the search:

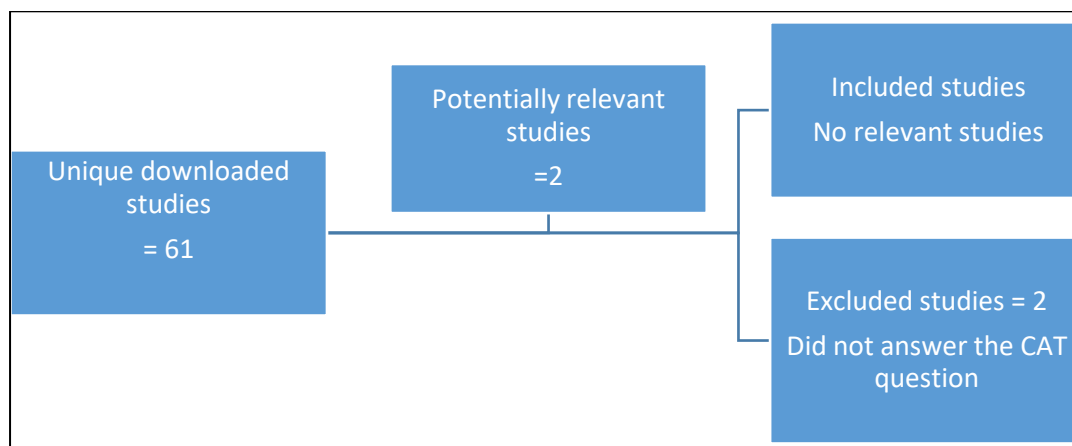


Figure 1: Search results table.

Summary

After screening the 61 potential articles identified in the search, only two pieces of literature were relevant to the clinical question. The information available from these two studies were accessed and analysed. One was a narrative review of spasticity interventions. It acknowledged that spasticity issues within people with Intellectual Disabilities (ID) was under recognised and under-treated, particularly amongst severe and profound LD (Palanichamy, 2020) and suggested potential beneficial effects of botulinum neurotoxin A on adult LD (mild, moderate, severe or profound). However, only an abstract was available for this study. The other article (Charles et al., 2010) reported a quasi-experimental design study concluding that spasticity management could have a profound effect on the ability to function for people with intellectual disability. However, various management strategies were implemented in the study, not just botulinum toxin injections, and many muscle groups were targeted when the botulinum injections were given. Specific effects for the hamstring muscle group could not be ascertained.

In conclusion, none of the studies identified answered the clinical question of whether regular botulinum toxin injections are effective to improve function and decrease pain for adults with learning disabilities who have hamstrings spasticity issues.

Implications for practice

Further research is required within this specialist field of clinical practice.

What would you post on X (previously Twitter)?

To advance clinical practice, further research is required into the effectiveness of botulinum toxin injections in improving function and decreasing pain for adults with learning disabilities who have hamstrings spasticity issues.

References

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Barnes, M.P., 1998. Management of spasticity. *Age and Ageing* 27(2): 239-245.

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Charles P.D.; Gill C.E.; Taylor H.M.; Putman M.S.; Blair C.R.; Roberts A.G.; Ayers G.D.; Konrad P.E.; 2010. Spasticity treatment facilitates direct care delivery for adults with profound intellectual disability. *Movement Disorders* 25(4): 466-473.

Doukas, T., Fergusson, A., Fullerton, M. and Grace, J., 2018, July. Supporting people with profound and multiple learning disabilities. *Journal of Applied Research in Intellectual Disabilities* 31(4): 624-624

Lance JW 1990 The control of muscle tone, reflexes, and movement: Robert Wartenberg Lecture *Neurology*; 30(12): 1303-1313.

Mencap (2025) "Postural care". Available at: <https://www.mencap.org.uk/advice-and-support/pml/pml-postural-care> (Accessed: 24th March 2025)

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National Institute for Health and Care Excellence (NICE). (2019) "Cerebral palsy in adults (NG119)" Available at: <https://www.nice.org.uk/guidance/ng119/resources/cerebral-palsy-in-adults-pdf-66141606816709> (Accessed: 24th March 2025)

Office for Health Improvement and Disparities (2025) "Learning disability - applying All Our Health: guidance". Available at: <https://www.gov.uk/government/publications/learning-disability-applying-all-our-health/learning-disabilities-applying-all-our-health> (Accessed: 24th March 2025)

Palanichamy R. 2020. Spasticity interventions in cerebral palsy for people with and without intellectual disabilities - a comparative analysis. *Physiotherapy* 107(Supplement 1): e191.

Public Health England. (2018) *"Postural care and people with learning disabilities: guidance"*. Available at: <https://www.gov.uk/government/publications/postural-care-services-making-reasonable-adjustments/postural-care-and-people-with-learning-disabilities> (Accessed: 24th March 2025)

Royal College of Physicians. (2018) *"Spasticity in Adults: Management Using Botulinum Toxin: National Guidelines"* Available at: https://www.rcp.ac.uk/media/i1ijs0tm/spasticity-in-adults_final-version_march-2019.pdf (Accessed: 24th March 2025)

CAT image	Evidence quality	Checkbox
	Good quality evidence to support use....	<input type="checkbox"/>
	Insufficient or poor quality evidence OR substantial harms suggest intervention used with caution after discussion with patient...	<input type="checkbox"/>
	No good quality evidence, do not use until further research is conducted OR Good quality evidence to indicate that harms outweigh the benefits....	<input checked="" type="checkbox"/>

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