

BONT-As FOR CERVICAL DYSTONIA: COST OF TREATMENT AND RESPONSE TO THERAPY IN CANADIAN PATIENTS

A COST EFFECTIVENESS MODEL

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BACKGROUND

- For adults with cervical dystonia (CD), treatment with botulinum neurotoxin type A (BoNT-A) can improve achievement of treatment goals.
- Differences across individual BoNT-A therapies with respect to acquisition cost, response rates, and dosing frequency can have implications for healthcare spending and patient outcomes

OBJECTIVE

The objective of this analysis was to evaluate average expenditures per response obtained with abobotulinumtoxinA (aboBoNT-A) and onabotulinumtoxinA (onaBoNT-A) for CD in Canada

METHODS

- A cost-effectiveness model was developed that incorporated data describing response rates in CD by BoNT-A therapy, health state utilities and health resource utilization by response status, and acquisition cost of BoNT-As in Canada. (Figure 1)
- Response rates and dosing intervals were based on a prospective observational study comparing Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS) scores for CD patients receiving aboBoNT-A (32.0%; 17.4 weeks) vs. onaBoNT-A (22.3%; 16.0 weeks).¹ (Table 1)
- Drug acquisition costs were based on Canadian unit costs (Table 2) with administration costs estimated to be \$120 per administration.
- Health resource use by response status was based on a physician survey initially conducted in the United Kingdom and validated by Canadian physicians. (Table 3)
- Health state utilities by response status were based on published data reporting change from baseline in utility following BoNT-A treatment (0.60 vs. 0.76). (Table 3)
- Quality-adjusted life years (QALYs) were also adjusted for adverse events (AEs) associated with oral therapies that are utilized more frequently by BoNT-A non-responders. (Table 3)

ANALYSIS OF DATA

- A 1000-iteration probabilistic sensitivity analysis (PSA) and one-way sensitivity analyses (OWSA) were conducted.

REFERENCES

¹ Misra VP, Danchenko N, Maisonobe P, Lundkvist J, Hunger M. Economic evaluation of AbobotulinumtoxinA vs OnabotulinumtoxinA in real-life clinical management of cervical dystonia. *Journal of Clinical Movement Disorders*. 2020 Dec;7:1-0.

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³ Hilker R, Schischniashvili M, Ghaemi M, Jacobs A, Rudolf J. Health related quality of life is improved by botulinum neurotoxin type A in long term treated patients with focal dystonia. *Journal of Neurology, Neurosurgery & Psychiatry*. 2001 Aug 1;71(2):193-9.

⁴ Matza LS, Deger KA, Vo P, Maniyar F, Goadsby PJ. Health state utilities associated with attributes of migraine preventive treatments based on patient and general population preferences. *Quality of Life Research*. 2019 Sep 15;28:2359-72.

⁵ Sullivan PW, Slejko JF, Sculpher MJ, Ghushchyan V. Catalogue of EQ-5D scores for the United Kingdom. *Medical Decision Making*. 2011 Nov;31(6):800-4.

RESULTS

- Compared with onaBoNT-A, aboBoNT-A resulted in lower annual costs per patient for the management of CD (savings of \$268), and higher QALYs (increase of 0.02). (Table 4)
- Results were driven by differences in injection intervals and a higher treatment response rate for people receiving aboBoNT-A compared with onaBoNT-A. (Table 4)
- Total annual cost per responder was lower for patients receiving aboBoNT-A compared with onaBoNT-A (CD: \$11,390 vs \$17,545). (Table 4)
- Results were consistent across sensitivity analyses.
 - The overall result of lower costs and higher QALYs was also observed in the PSA
 - In OWSA (Figure 2), incremental costs were most sensitive to dose and dosing interval inputs, while incremental QALYs were most sensitive to utility per response status inputs

Table 1: Response to therapy

	aboBoNT-A	onaBoNT-A	Source
Response rate: N (%)	253 (32%)	103 (22.3%)	Misra et al. ¹ INTEREST-1 study
Dose (units): Mean (SE)	500 (100)	160 (32)	Misra et al. ¹ INTEREST-1 study
Dosing interval (weeks): Mean (SE)	17.4 (6.9)	16.0 (5.4)	INTEREST-1 clinical study report

SE=Standard error

Table 3: Costs and HRQOL by

	Responders to therapy	Non-responders to therapy	Source
Health care utilization costs: Mean (SE)	\$863 (\$184)	\$1,429 (\$229)	Johnston et al. 2020 ²
Health state utility (overall): Mean (SE)	0.76 (0.03)	0.60 (0.03)	Hilker et al. 2001 ³
QALY decrement: adverse events due to oral therapies	-0.007	-0.048	Matza et al. 2019 ⁴ Sullivan et al. 2011 ⁵

QALY=Quality-adjusted life year; SE=Standard error

Table 2: Cost of BoNT-A therapies

	Vial size (units)	Cost	Cost per unit
aboBoNT-A	300	428.40	1.43
	500	714.00	1.43
	50	178.5	3.57
onaBoNT-A	100	357	3.57
	200	714	3.57

Table 4: Absolute and incremental results, overall and by responder status

	Absolute results		Incremental results
	aboBoNT-A	onaBoNT-A	
Costs			
BoNT-A costs	\$3,744	\$4,016	-\$271
HCRU costs	\$2,496	\$2,712	-\$216
Responders			
Cost per responder	\$1,248	\$1,303	-\$55
QALYs			
Based on response status	32%	22%	10%
AE disutilities	\$11,701	\$18,007	-\$6,306
AE incidence (%)			
Dry mouth	0.62	0.60	0.02
Forgetfulness	0.65	0.64	0.02
Drowsiness	-0.035	-0.039	0.004
Fatigue	21.5%	24.4%	-3.0%
Dizziness	13.2%	15.0%	-1.8%
	12.6%	14.0%	-1.4%
	7.6%	8.7%	-1.1%
	6.4%	7.0%	-0.6%
Incremental cost per responder			aboNT-A dominates
Incremental cost per QALY			aboNT-A dominates

AE=Adverse Event; QALY=Quality-adjusted life year

Figure 1: Model structure

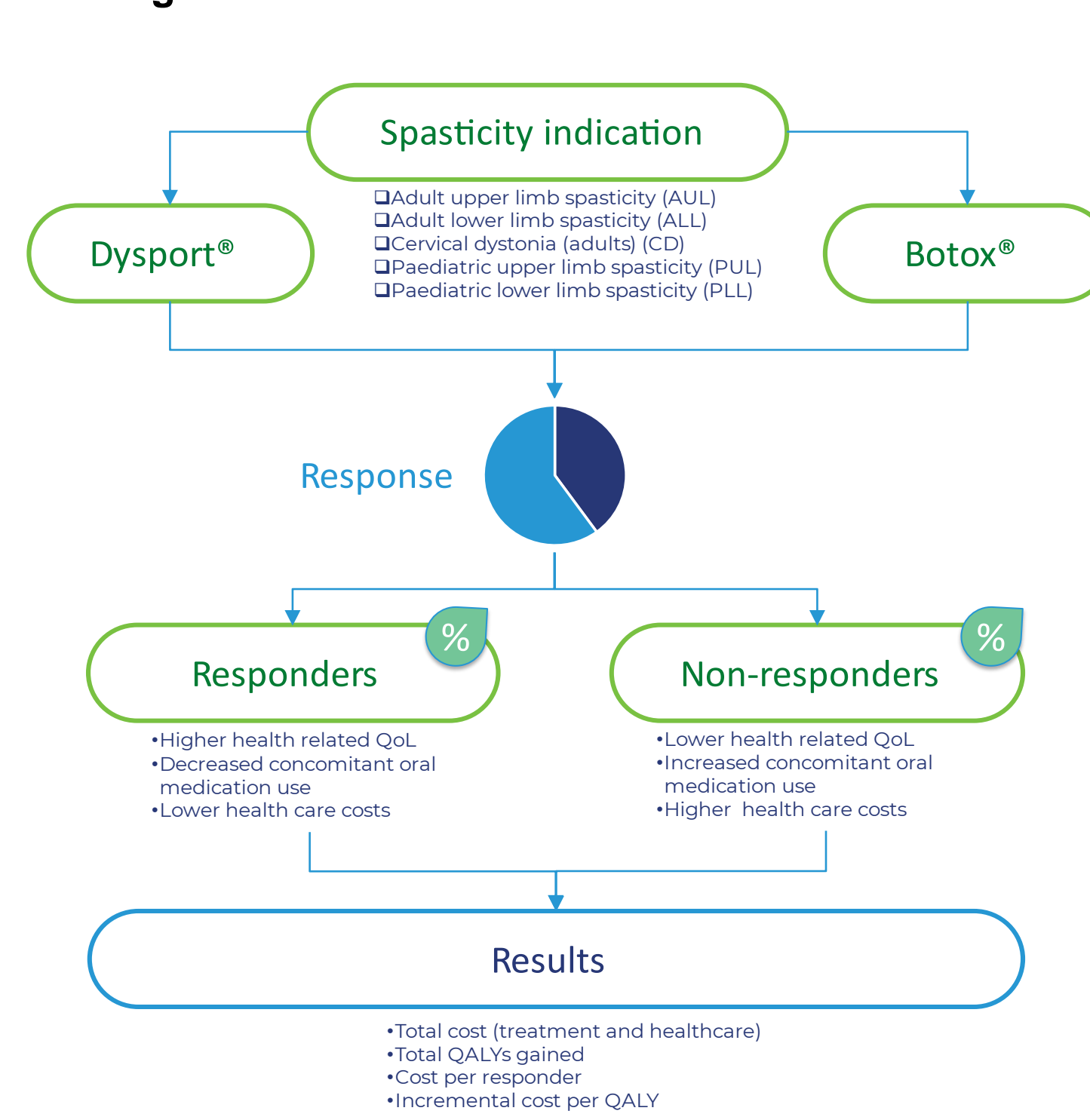
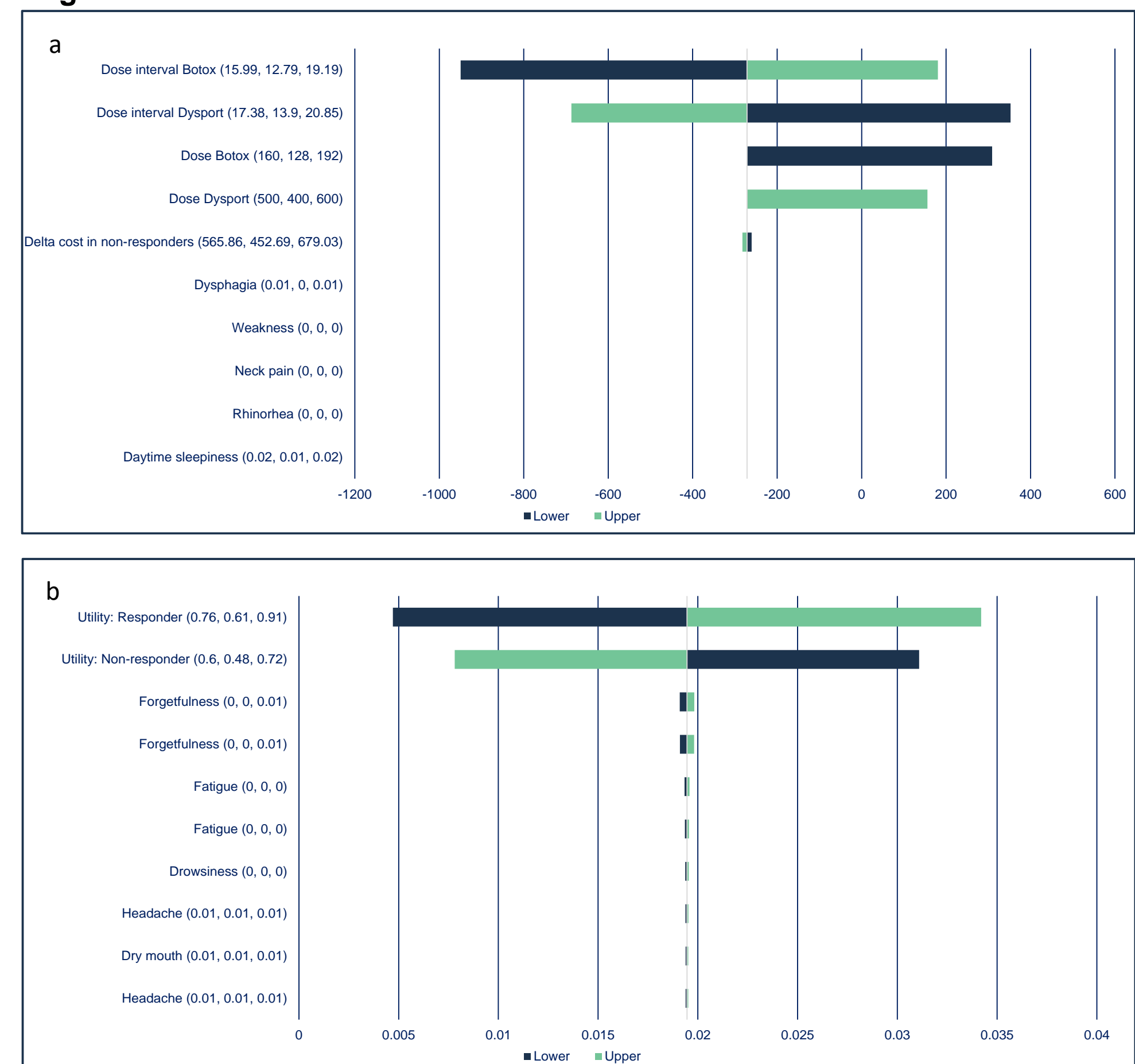


Figure 2: OWSA results



Footnote: a) incremental costs and (b) incremental QALY

LIMITATIONS

- Health-related quality of life data were taken from a variety of published sources, including assumed utilities values for adverse events of oral therapies
- Resource use estimates from the UK were assumed to apply to Canadian CD patients

CONCLUSION

With higher response rates and reduced costs, aboBoNT-A may be an optimal choice for treating cervical dystonia in Canada.

DISCLOSURES

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