

BONT-As FOR ADULT UPPPER LIMB SPASTICITY: COST OF TREATMENT AND RESPONSE TO THERAPY IN CANADIAN PATIENTS

A COST EFFECTIVENESS MODEL

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BACKGROUND

- For adults with adult upper limb spasticity (AUL), 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 AUL in Canada

REFERENCES

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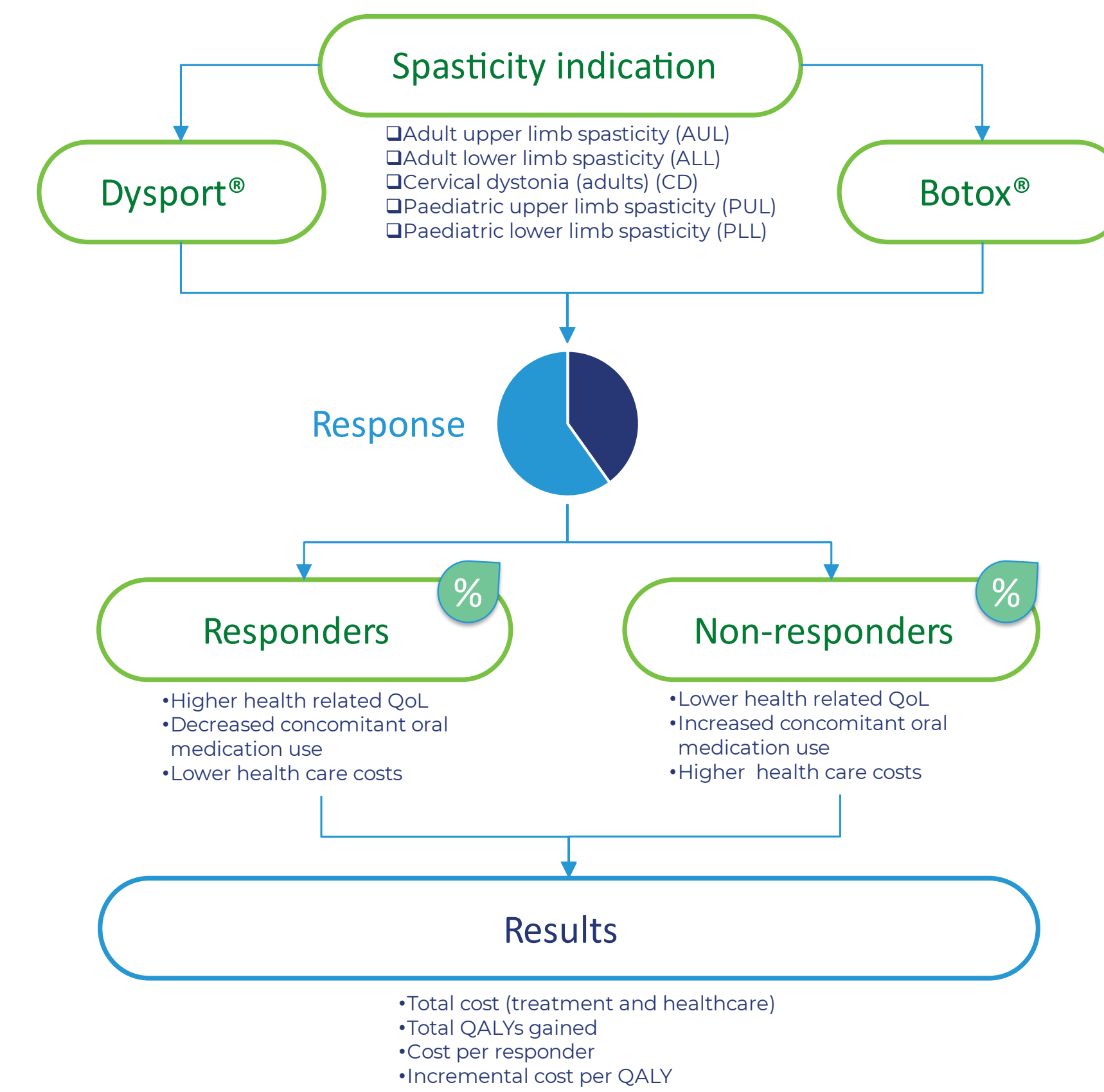
DISCLOSURES: This study was funded by ISPOR Canada. KMJ and EG are employees of Broadstreet HEOR, which received funds from IPSEN Canada for this work. YP is an employee of IPSEN Canada.

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METHODS

- A cost-effectiveness model was developed that incorporated data describing response rates in AUL by BoNT-A therapy, health state utilities and health resource utilization by response status, and acquisition cost of BoNT-As in Canada. (Figure 1)

Figure 1: Model structure



RESULTS

- Compared with onaBoNT-A, aboBoNT-A resulted in lower annual costs per patient for the management of AUL (savings of \$117), 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 (\$10,239 vs \$13,037). (Table 4)

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

	Absolute results		Incremental results
	aboBoNT-A	onaBoNT-A	
Costs	\$7,731	\$7,848	-\$117
BoNT-A costs	\$2,085	\$2,222	-\$136
HCRU costs	\$5,645	\$5,626	\$19
Responders	\$0	\$0	\$0
Cost per responder	76%	60%	15%
QALYs	\$10,239	\$13,037	-\$2,797
Based on response status	0.59	0.57	0.022
AE disutilities	0.60	0.58	0.02
AE incidence (%)	-0.006	-0.007	0.001
Dry mouth	9.7%	11.3%	-1.5%
Forgetfulness	3.6%	4.3%	-0.7%
Drowsiness	2.1%	2.6%	-0.4%
Fatigue	1.9%	2.1%	-0.2%
Dizziness	1.1%	1.3%	-0.2%
Incremental cost per responder			aboBoNT-A dominates
Incremental cost per QALY			aboBoNT-A dominates

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

- Response rates and dosing intervals were based on a prospective observational study (ULIS-III) comparing Goal Attainment Scale (GAS) scores for AUL patients receiving aboBoNT-A (75%; 31.8 weeks) vs. onaBoNT-A (60%; 29.1 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 (0.50 vs. 0.63). (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)

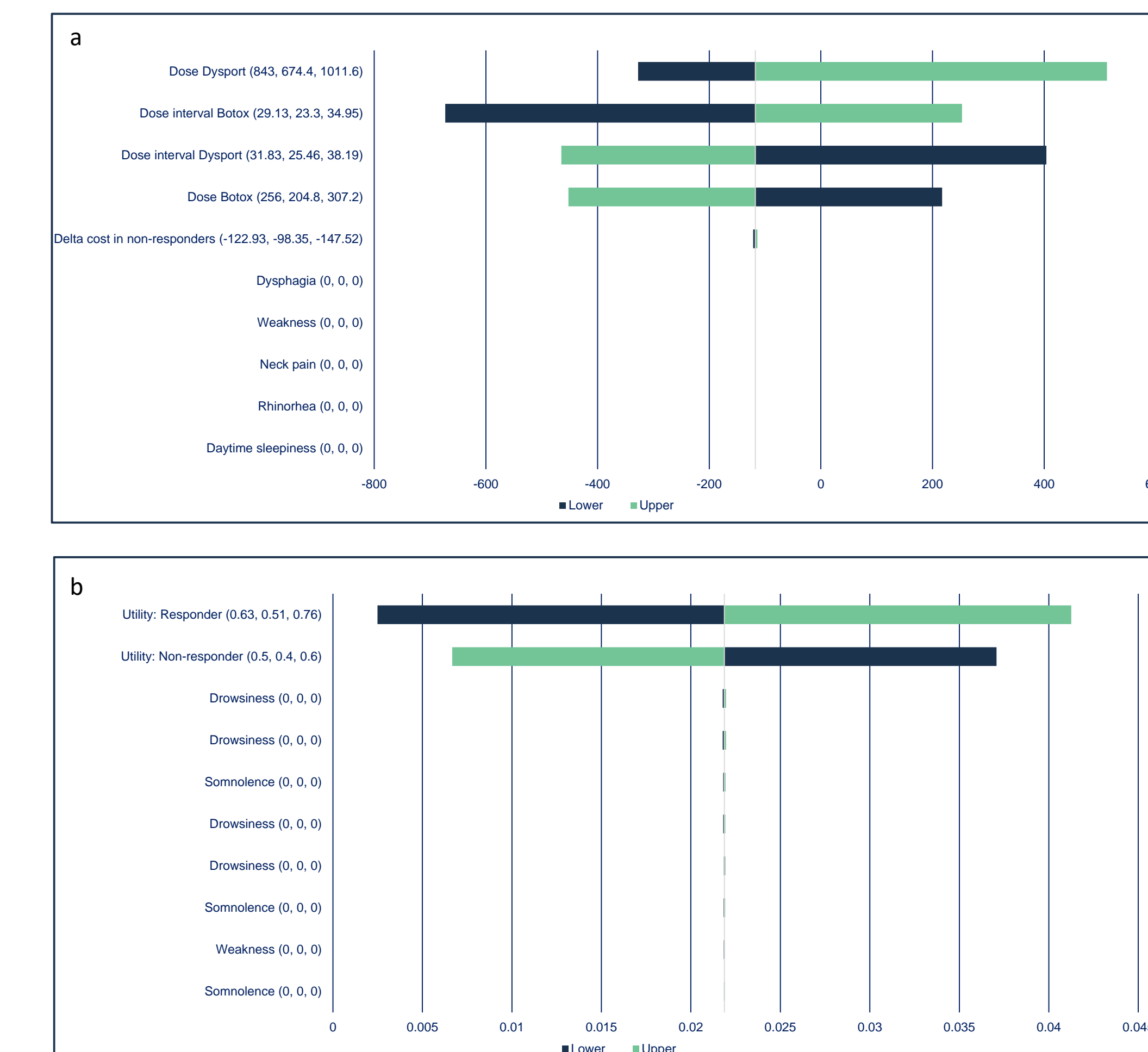
ANALYSIS OF DATA

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

- 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

Figure 2: OWSA results



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

Table 1: Response to therapy

	aboBoNT-A	onaBoNT-A	Source
Response rate: N (%)	555 (75%)	196 (60%)	ULIS-III
Dose (units): Mean (SE)	843 (353)	256 (136)	ULIS-III
Dosing interval (weeks): Mean (SE)	31.8 (23.9)	29.1 (34.9)	ULIS-III

SE=Standard error

Table 2: Cost of BoNT-A therapies

	Vial size (units)	Cost	Cost per unit
aboBoNT-A	300	385.50	1.29
	500	642.60	1.29
onaBoNT-A	50	187.43	3.75
	100	374.85	3.75
	200	749.70	3.75

Table 3: Costs and HRqOL by response status

	Responders to therapy	Non-responders to therapy	Source
Health care utilization costs: Mean (SE)	\$5,675 (\$2,966)	\$5,552 (\$2,966)	Johnston et al. 2020 ²
Health state utility (overall): Mean (SE)	0.63 (0.01)	0.50 (0.01)	Doan et al. 2013 ³
QALY decrement: adverse events due to oral therapies	-0.005	-0.015	Matza et al. 2019 ⁴ Sullivan et al. 2011 ⁵

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

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 AUL patients

CONCLUSION

With higher response rates and reduced costs, aboBoNT-A may be an optimal choice for treating adult upper limb spasticity in Canada.

