

The Impact of Hospital Surgical Volume on Healthcare Utilisation Outcomes after Paediatric Thyroidectomy



Awards/Funding: Pitblado Clinical and Basic/Translational Discovery Grant (Garron Family Cancer Centre, The Hospital for Sick Children, Toronto). Canadian Paediatric Endocrinology Fellowship Program Award.

Alexander D Chesover¹, Antoine Eskander², Rebecca Griffiths³, Jesse D Pasternak⁴, Jason D Pole⁵, Nikolaus E Wolter⁶, Jonathan D Wasserman¹

(1) Division of Endocrinology, The Hospital for Sick Children and Department of Paediatrics, University of Toronto, Canada. (2) Division of Otolaryngology-Head & Neck Surgery, Sunnybrook Health Sciences Centre and Michael Garron Hospital, University of Toronto, Canada. (3) Institute for Clinical and Evaluative Sciences, Queen's, Kingston, Canada. (4) Division of Surgery, University Health Network, Toronto, Canada. (5) Institute for Clinical and Evaluative Sciences, Toronto, Canada. (6) Division of Otolaryngology, The Hospital for Sick Children, Toronto, Canada.

BACKGROUND & CONTEXT

- Complications from thyroidectomy more common in children.
- High-volume surgeons associated with better outcomes.
- 25-30 thyroidectomies/year needed to maintain proficiency.
- Hospital volume is less frequently studied.
- Healthcare utilisation outcomes are under-reported.
- Ontario uses a single-payor insurance system.
- Administrative and health-related data are linked through ICES.
- Ontario is divided into 14 Local Health Integration Networks (LHINs).

AIMS

1. To describe paediatric thyroidectomy patterns in Ontario.
2. To investigate relationships between hospital volume and healthcare utilisation outcomes following thyroidectomy.

METHODS

Retrospective analysis of administrative and health-related data, which is collected prospectively through ICES.

Included	Excluded
<ul style="list-style-type: none"> <18 year old Ontario residents April 1993 to March 2017 First thyroidectomy Provincially insured 	<ul style="list-style-type: none"> Missing discharge date Previous cancer diagnosis Previous or repeat thyroidectomies

Defining Hospital Volume
Paediatric thyroid surgical volume, per hospital, in the preceding year.

- Multivariate Analysis**
- Cox proportional hazard regression and linear regression analyses.
 - **Co-variables:** age, sex, co-morbidity, deprivation, distance to hospital, rurality, year of surgery, immigration status, type of surgery, cancer.

RESULTS

1. Patterns of Surgical Care: Annual Hospital Volume by Quartile

Variable	Total (n=1908)	Hospital Volume Quartile			
		1 (n=589)	2 (n=364)	3 (n=479)	4 (n=476)
Thyroidectomies/year ^a (median, range)	N/A	0 [0-1]	3 [2-4]	11 [5-18]	38 [19-60]
Number of Hospitals ^b	82	81	44	14	3

^a Number of thyroidectomies in the year preceding the patient's thyroidectomy.
^b Over time, a hospital's surgical volume may fall into more than one quartile.

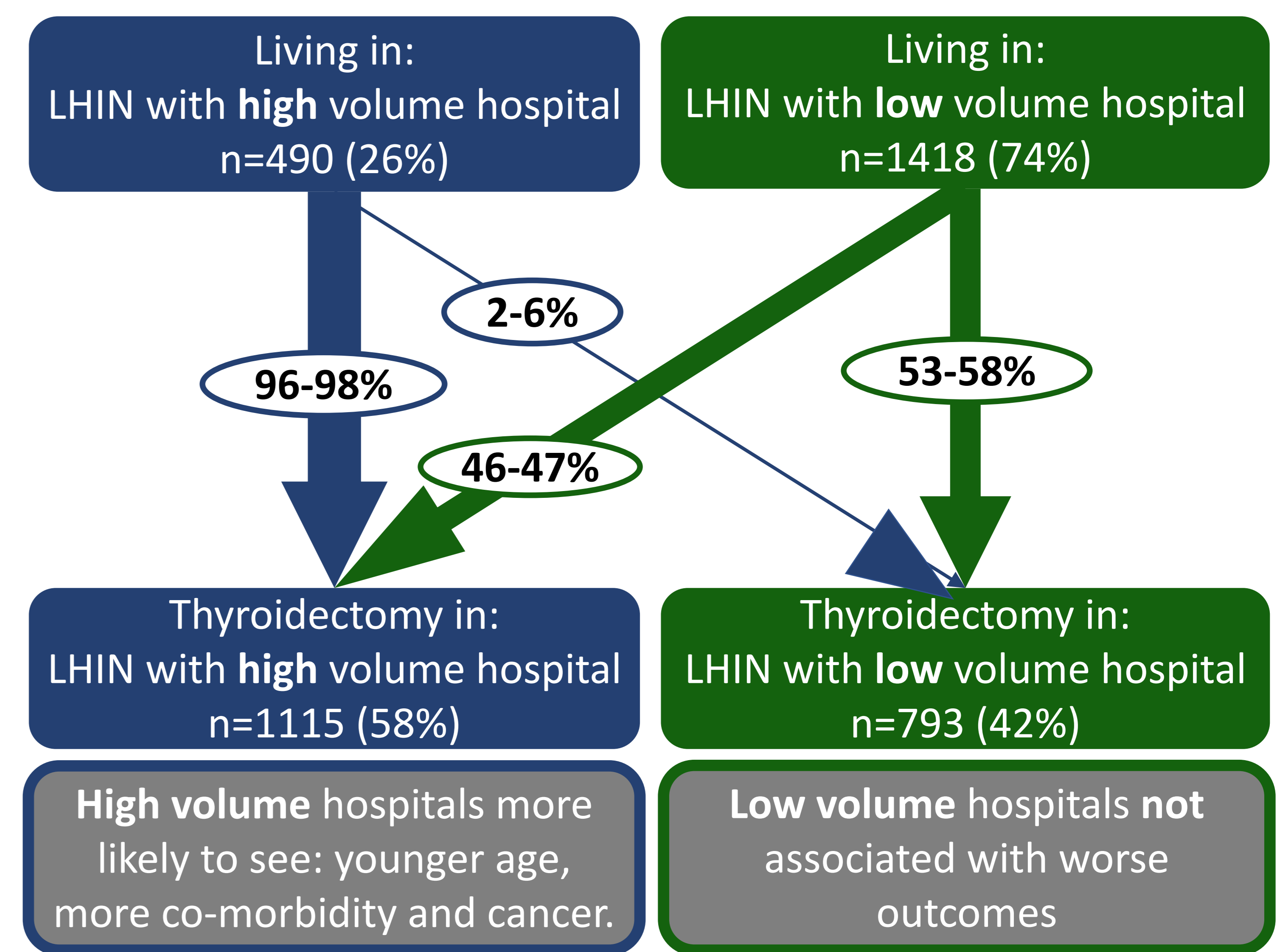
2. Healthcare Utilisation Outcomes

Emergency department (ED) visit (within 30 days of surgery)

- Overall: 136/1908 (8.2%)
- No difference between hospital volumes
- **Increased ED visit rate for:**
 - **Males:** HR 1.68 [95% CI 1.16, 2.43; p<0.01]
 - **Increased socioeconomic deprivation:** HR 1.89 [95% CI 1.10, 3.27; p=0.0022]
 - **Rurality:** HR 2.48 [95% CI 1.38, 4.46; p<0.01]
- **Implications:** identify factors placing these groups at higher risk and consider measures to mitigate risk.

Readmission (within 30 days of surgery)	Length of Stay	Same Day Surgery
<ul style="list-style-type: none"> • Overall: 37/1908 (1.9%) • No difference in readmission rates between hospitals with different surgical volumes 	<ul style="list-style-type: none"> • Overall: 1.60 ± 3.13 days. • Increased by 0.6 days at high-volume hospitals [95% CI 0.20, 1.08; p<0.01] • Possible confounding by case type/complexity. 	<ul style="list-style-type: none"> • Overall: 324/1908 (17%) • Decrease proportion at high-volume hospital: OR 0.17 [95% CI 0.07, 0.42; p<0.01]

Referral Patterns



LIMITATIONS

- Surgeon volume and surgeon sub-specialty data not captured.
- Cannot determine clinical decision making.
- Long-term outcomes related to medical care not evaluated.

CONCLUSIONS

- Low hospital surgical volume **not** associated with poorer healthcare utilisation outcomes.
- High hospital surgical volume associated with:
 - increased length of stay;
 - lower likelihood of same day surgery.
- Higher rate of ED visits in some groups.
- Referral pattern variation may reflect appropriate clinical decision making (increased case complexity at high-volume hospitals and no worse outcomes at low-volume hospitals).

Poster Session Online
Presented at: XXXI ESPE 2021
Thyroid
Alexander Chesover
P1-191
345365