

Gender gap and declining surgical activity among new graduates: cataract surgery in Ontario

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ABSTRACT • RÉSUMÉ

Objective: To investigate the proportion of ophthalmologists performing cataract surgery; the volume performed; and the influence of career stage, sex, and trends over time.

Design: Population-based study of cataract surgical practice patterns among all ophthalmologists in Ontario, Canada, from April 1999 to March 2013.

Participants: All active ophthalmologists in Ontario, Canada, providing government health care for the provincial population of approximately 13 million.

Methods: The IntelliHealth database operated by the Ministry of Health and Long Term Care, which has excellent accuracy for procedure performance, was used to obtain anonymized physician services.

Results: The percentage of ophthalmologists performing cataract surgery decreased (68% to 64%), but the yearly mean number of cataract surgeries performed per person increased 1.5 times (307.7 to 470.2). The percentage of early-career ophthalmologists performing cataract surgery declined from 85% to 62%, and this was accompanied by a decline in the median number of cases performed per early-career surgeon (from 243.0 to 169.5). This decline in surgical activity among new graduates was accompanied by growth in the percentage of high-volume and late-career surgeons. In each of the years studied, males performed more surgeries per person than their female counterparts, and this gap grew from 1.4 times to 1.7 times more cataract surgery from 2000 to 2013.

Conclusions: Early-career ophthalmologists are becoming less active with cataract surgery, which may be explained by the increasing surgical activity among late-career and high-volume ophthalmologists. A large sex and volume gap exists among cataract surgeons, which continues to increase.

Objet : Déterminer la proportion d'ophtalmologistes qui pratiquent des chirurgies de la cataracte, le nombre de chirurgies pratiquées et l'incidence qu'ont sur ces questions le stade de la carrière, le sexe et des tendances au fil du temps.

Nature : Étude des schémas de pratique de la chirurgie de la cataracte des ophtalmologistes de l'Ontario, au Canada, entre avril 1999 et mars 2013.

Participants : Tous les ophtalmologistes actifs en Ontario, au Canada, fournissant des services de santé universels à la population de la province, laquelle avoisine 13 millions d'habitants.

Méthodes : Nous avons utilisé la base de données IntelliHealth du ministère de la Santé et des Soins de longue durée pour obtenir des données anonymisées sur les services fournis par les médecins. L'exactitude des données de cette base sur les actes réalisés est excellente.

Résultats : Le pourcentage d'ophtalmologistes pratiquant des chirurgies de la cataracte a diminué (de 68 % à 64 %), mais le nombre moyen annuel de chirurgies de la cataracte pratiquées par personne est 1,5 fois plus élevé qu'il l'était (passé de 307,7 à 470,2). Le pourcentage d'ophtalmologistes en début de carrière qui pratiquent des chirurgies de la cataracte a baissé de 85 % à 62 % et cela s'est accompagné d'une baisse du nombre médian de chirurgies pratiquées par des chirurgiens en début de carrière (de 243,0 à 169,5). Cette baisse de l'activité chirurgicale chez les nouveaux diplômés a été accompagnée d'une augmentation des pourcentages de chirurgiens pratiquant un volume élevé de chirurgies et de chirurgiens en fin de carrière. Pour chacune des années étudiées, le nombre de chirurgies pratiquées par personne était plus élevé chez les hommes que chez les femmes, et l'écart a augmenté de 1,4 fois plus à 1,7 fois plus pour les chirurgies de la cataracte entre 2000 et 2013.

Conclusions et pertinence : Les ophtalmologistes en début de carrière réalisent moins de chirurgies de la cataracte qu'auparavant, ce qui pourrait s'expliquer par l'augmentation de l'activité chirurgicale d'ophtalmologistes pratiquant un volume élevé de chirurgies et d'ophtalmologistes en fin de carrière. Il y a des écarts importants en fonction du sexe et du volume de chirurgies parmi les chirurgiens de la cataracte, et ces écarts continuent de s'accroître.

Because of aging of the population, the annual rate of cataract surgery in North America is expected to rise exponentially.¹ It is estimated that, by the year 2020, over 30 million Americans will have cataracts, which are the leading cause of blindness worldwide.² Cataract extraction is consequently one of the most commonly performed surgical procedures in medicine and remains the only established intervention to improve vision loss from cataracts.³ Cataract surgery is considered a core

competency in ophthalmology, meaning that every ophthalmology graduate from an accredited program must demonstrate satisfactory skills in this area.⁴ Despite the resources invested in teaching cataract surgery to ophthalmology residents, the proportion of practicing ophthalmologists performing this procedure is unknown. Previous studies in the area of strabismus and glaucoma surgery have found that these surgeries are performed by a smaller number of high-volume surgeons.⁵⁻⁷ If this is the case

with cataract surgery it could have important implications for residency training and future human resource planning.

The goal of this study was to determine the proportion of ophthalmologists performing cataract surgery and how this has changed over a 14-year period. In addition, trends in the proportion of high-volume surgeons and the influence of sex and career stage were evaluated.

METHODS

Design and Setting

This was a retrospective population-based study in Ontario, which is Canada's most populous province with a population that ranged from 11.7 to 13.5 million during the study period (April 1, 1999, to March 31, 2013, 14 fiscal years). Ontario provides universal government-funded health care to all of its citizens, eligible permanent residents, and landed immigrants through the Ontario Health Insurance Plan (OHIP). Ontario-licensed physicians receive fee-for-service payment by submitting specific billing codes; they cannot bill patients directly for services covered by OHIP. This allows the Ontario population to serve as an ideal cohort to study surgical procedure output. The OHIP billing database accessed through the IntelliHealth system has been used in previous population-based studies.^{7–9} Studies have shown an over 90% agreement between physician claims and clinical records.¹⁰ Ethics approval was not required, and a waiver was obtained from the University Health Network, Toronto, Canada, for this study because these data are in the public domain and are automated for both patient and physician.

Sources of Data

OHIP billing codes were accessed via the Medical Services database in the IntelliHealth Ontario system, which contains detailed information on physician billing, procedures, and provincial hospital information. The Ontario Schedule of Benefits published each year by the Ministry of Health and Long Term Care contains the specific billing codes that physicians must use for each procedure and the financial remuneration for each service. An ophthalmologist was defined as a physician who submitted 1 or more of the following ophthalmology-specific codes for remuneration in 1 fiscal year:

- A233—Specific Assessment
- A234—Partial Assessment
- A235—Consultation
- A253—Optometrist-Requested Assessment (code introduced in 2009)

This ensured that all ophthalmologists included in the study were active during each year studied. Physicians meeting these criteria were extracted from the database, along with their sex and year of medical school graduation.

Early-career ophthalmologists were defined as those who graduated medical school less than 10 years from the study year, midcareer ophthalmologists were defined as those who graduated medical school 10–45 years from the study year, and late-career ophthalmologists were defined as those who graduated medical school more than 45 years from the study year.

A cataract surgeon was defined as a physician who submitted 1 or more of the following billing code claims in a fiscal year:

- E140A—Cataract surgery including insertion of intraocular lens
- E214A—Glaucoma filtering procedure and cataract extraction

There were no other billing codes that a physician could submit to receive remuneration for cataract surgery in Ontario. High-volume surgeons were defined as those who performed 600 or more cataract surgeries in 1 fiscal year. This number was chosen to reflect the number of annual cases performed if 12 cases (1 average operating room day) were performed per week for 50 weeks of the year. A second group of very high-volume surgeons were also assessed and defined as those who performed 1000 or more cataract surgeries in 1 fiscal year (20 cases per week for 50 weeks).

Statistical Methods

The IntelliHealth data were exported to Microsoft Excel 2013 (Redmond, Wash.) and represented graphically. Because the entire Ontario population of active ophthalmologists was included in the study, the population means were not compared using statistical tests since the results represent true differences between groups.

RESULTS

During the study period, there were a median of 429.5 (33.8 per 1 million population) ophthalmologists in Ontario, ranging from 420 to 472 (35.3–34.9 per 1 million population). The proportion of ophthalmologists performing cataract surgery decreased from 68.3% in 2000 to 64.4% in 2013 with the highest percentage of 71.6% seen in 2008 (Fig. 1). Among ophthalmologists performing cataract surgery, the mean number of surgeries per physician increased 1.5 times from 307.7 surgeries in 2000 to 470.2 in 2013, with the highest number of 483.1 seen in 2006. The 95th percentile for surgical volume increased approximately 1.6 times over the same period with a peak in 2008 of 1260.0 cataract surgeries per year.

The number of high-volume surgeons (those performing 600 cataract surgeries or more per year) increased from 9.6% of all ophthalmologists performing cataract surgery in 2000 to 30.5% in 2013 (Fig. 2). Very high-volume

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