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BMJ Open

Creation of a Nation-Wide Breastfeeding Policy for Surgical Residents: A Scoping Review Protocol

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Manuscripts

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3 **Creation of a Nation-Wide Breastfeeding Policy for Surgical Residents:**
4 **A Scoping Review Protocol**
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For peer review only

Abstract Word Count: 283 words**Abstract****Introduction:**

Breastfeeding is recommended for the first year of a baby's life due to numerous benefits for both the child and mother. After returning from maternity leave, surgical trainees face extensive barriers to breastfeeding and tend to terminate breastfeeding earlier than guideline recommendations. The aim of this scoping review is to assess existing breastfeeding policies for surgical trainees at the national level including post-graduate medical education ('PGME') offices, provincial resident unions, and individual surgical programs.

Methods and Analysis:

A modified Arksey and O'Malley (2005) framework will be utilized. Specifically, (1) identifying the research question/s and (2) relevant studies from electronic databases and grey literature, (3) identifying and 4) selecting studies with independent verification, and (5) collating, summarizing, and reporting data while having ongoing consultation between experts throughout the process. Experts will include a lactation consultant (AGB), a human resource leader (JI), a health information specialist (ES), two independent coders (NZ, LR), and a board-certified surgeon (JD). This work will take place as of December 2020 and be carried out to completion in 2021.

Ethics and Dissemination:

Ethics approval will not be sought for this scoping review. Research findings will be disseminated through publications, presentations, and meetings with relevant stakeholders.

Strengths and Limitations of this Study

- A scoping review examining breastfeeding policies in Canada has not been published
- A rigorous methodological framework will be used to ensure numerous quality checks and extensive use of grey literature will be used to better understand this specific policy landscape
- Findings will add to the health literature of using a scoping review to inform policy generation for breastfeeding surgical residents in Canada
- Only English language articles will be used and published studies about breastfeeding policies may be limited

BACKGROUND

Although breastfeeding has been shown to have numerous benefits for both child and mother, it continues to be a challenge for surgical residents. Exclusive breastfeeding is recommended until a baby has reached 6 months of age, after which the continuation of breastfeeding with the addition of solids is recommended for up to one to two years or longer as mutually desired by mother and infant.¹⁻³ The benefits of breastfeeding for the infant include decreased risk of infection in multiple organ systems,^{4,5} sudden infant death syndrome,⁶ allergies,⁷ adolescent and adult obesity,⁸ certain cancers,⁹ and diabetes.¹⁰ Breast milk has been shown to be especially beneficial for preterm infants with greater scores across mental, motor, and behavioral ratings.^{1,11-13} Maternal benefits of breastfeeding include rapid uterine involution, increased weight loss¹⁴ and decreased rates of postpartum depression,¹⁵ type II diabetes,¹⁶ and hypertension, hyperlipidemia, and cardiovascular disease,¹⁷ as well as decreased risk of breast and ovarian cancer.^{18,19}

Physician mothers are a high-risk group for unintended weaning, with less than one third achieving their personal goal of breastfeeding duration.²⁰ Ninety-seven percent of physician mothers report at least one perceived barrier to successful breastfeeding in the workplace.²⁰ Lack of support for expressing breast milk (pumping) is cited as one of the main reasons for discontinuing breastfeeding prematurely.²⁰⁻²³ A Canadian study based out of Newfoundland and Labrador found that specialist physicians breastfed their babies for shorter periods than their generalist counterparts.²⁴ Physicians who reported longer maternity leaves, dedicated lactation areas, and accommodating schedules (both time to pump and/or shorter working hours) were more likely to breastfeed for at least 12 months post-partum and reach their personal breastfeeding goals.²⁰⁻²³

Breastfeeding challenges are magnified for surgical resident physicians.^{20,25-28} The workplace culture, workplace setting (time spent predominantly in the operating room or emergency department), long hours, and traditionally male dominated field (70.6% of all Canadian surgeons are male²⁹) makes breastfeeding especially difficult. Furthermore, surgical residents are at increased risk of preterm delivery.^{30,31} Breastmilk is particularly important for preterm babies, as laid out by the American Association of Pediatric breastfeeding.¹ At six months, non-obstetrical and gynecology ('OBGYN') surgical residents were found to be breastfeeding significantly less (41%) than their OBGYN counterparts (59%, $p < 0.01$).³² General surgery residents felt that their role as "resident" was primarily responsible for not allowing them to meet their breastfeeding goals.³³ Multiple studies have suggested that the lack of breastfeeding policies is a hinderance to meeting breastfeeding goals for all residents.^{22,23,27,28,32} Breastfeeding policies pertain both to breastfeeding a baby directly and expressing milk (also known as 'pumping').

Scoping reviews have been used in the development of policies that address suicide prevention in children and adolescents,³⁴ improve postnatal care,^{35,36} improve interventions to reduce frailty in the elderly,³⁷ and reduce waiting times for elective surgery.³⁸ To our knowledge, this scoping review is the first examining breastfeeding policies for surgical residents.

The purpose of this protocol is to describe the scoping review methodological approach that will guide the completion of this review. We aim to identify and summarize breastfeeding policies in the published and grey literature using a modified Arksey and O'Malley framework.³⁹⁻

41 The outcome of the scoping review will be used to develop a comprehensive national breastfeeding policy for surgical residents.

METHODS AND ANALYSIS

An integrated Arksey and O'Malley (2005)³⁹ and Levac et al (2010)⁴⁰ protocol will be used similar to an article recently published by one of the authors.⁴¹ The protocol includes six stages and will be discussed at length below.

Stage 1: Ongoing Consultation

Consultation between relevant stakeholders will commence at the beginning of the process and continue throughout the study duration.³⁹⁻⁴¹ Four consultants have been selected with unique knowledge bases: a lactation consultant for her breastfeeding expertise, a human resource specialist to help weigh in on the available policies, a board-certified surgeon to provide knowledge on the practicality of breastfeeding policies, and a health information specialist to assist in ensuring a thorough literature search.

Stage 2: Identify the Research Question/s

Levac et al (2010)³⁶ defines the research question as being broad in nature with a clear scope of inquiry and a defined outcome. Thus, our research question is: what are the Canadian national breastfeeding policies for surgical resident physicians? Specifically,

- a) what are published breastfeeding policies for surgical resident physicians?
- b) what are the publicly/privately available breastfeeding policies at the post-graduate medication education (PGME) offices?
- c) what is included in the collective agreements at the provincial resident union level on the breastfeeding rights of residents?
- d) What are the breastfeeding policies at the hospital and divisional levels, nationwide?
- e) If no/minimal information is found on the Canadian national stage, what are the available breastfeeding policies in top US schools for surgical resident physicians?

Second, of these studies and policies that exist, what details do the policies cover? Specifically, location of breastfeeding or expressing breastmilk, accessories/equipment to facilitate breastfeeding or expressing milk (for example, a fridge to store expressed breast milk, a hospital-grade pump), timing and duration of breaks, support for residents, breastfeeding rights and others. These variables were chosen with the guidance of the lactation consultant (AGB). By better understanding the available breastfeeding policies for surgical residents, we can advocate for more comprehensive or improvement to existing policies.

Stage 3: Identify Breastfeeding Policies

Identifying relevant breastfeeding policies will occur via four major avenues. First, the health information specialist (ES) will help to define a key article search. Relevant databases will include Ovid MEDLINE, Embase, Web of Science, and Scopus. Search terms will include combinations of database subject headings (e.g. MeSH, Emtree) and text words for surgical residents, breastfeeding, and policy. The MEDLINE search strategy is found in Appendix 1: Search Strategy Example. A grey literature search will locate all division and PGME breastfeeding policies as well as any information on breastfeeding policies in the resident union collective agreements. A mix

of search terms will be used: breastfeeding and resident, nursing, lactation, and breastfeeding policy to determine if there are any relevant policies. Third, for websites where information is not publicly available, the relevant PGMEs, surgical divisions, and resident unions will be contacted via email requesting access to breastfeeding policies that pertain to surgical residents. This step represents best practice guidelines in scoping reviews.^{42,43} Social media, specifically Dr. Milk, a private Facebook© (2020 Facebook, Menlo Park, CA, USA) group spanning almost 30,000 physician mothers, will be searched for any relevant policies and a post asking for relevant policies will be completed. The use of Facebook© (2020 Facebook, Menlo Park, CA, USA) groups to study lactation has been done before.²¹ Finally, if minimal/no policies are found, American universities with surgical departments will be queried using similar search parameters as described above. The top 50 American Medical Schools from the QS World University Rankings Top Medical Schools 2020 will be used.⁴⁴ This comprehensive list uses four indicators to rank universities: academic and employer reputations from QS's global surveys as well as research citations per paper and H-index as determined by Elsevier's Scopus database.⁴⁵ The searches will be limited to English, with no time restriction.

Stage 4: Study Selection

A team approach with two independent coders will be used for study selection. The process will include post-hoc inclusion and exclusion criteria after familiarization of data as suggested by Arksey and O'Malley³⁹; additionally, a small pilot will be completed to ensure common understanding of the criteria. The independent coders will meet at the beginning, midpoint, and final stages of the study selection phase, and any disagreements will be resolved by a third party to ensure qualitative inter-rater reliability.⁴⁰

Stage 5: Charting the Data

After articles and grey literature have been selected, data extraction will take place using an iterative process with two independent coders for quality control. A pre-formed template completed a priori to data extraction will be used on Excel. The coding manual will be created to guide template use to ensure both coders are extracting data and coding in the same way. Quantitative data extracted will include source of breastfeeding policy (published or grey literature), residents covered under policy (surgical and/or other specialties), details of policy (timing of work breaks for milk expression, location, accommodation for resident, role of resident, etc). In addition, published articles will include information on authors, journal, year of publication, and study location.

The breastfeeding policies will then be compared using Human Resource best practices as well as the Public Service of Ontario Act: an ethical framework for public bodies to determine where policies are deficient.⁴⁶ Specifically, any policy would reference the Ontario (or relevant provincial body) Human Rights Commission which prohibits discrimination and protects the rights of pregnant and breastfeeding women.⁴⁷ It is against the law to discriminate against a woman who is pregnant or breastfeeding.

According to the Canadian Human Rights Commission, a breastfeeding mother should be provided with enough time to breastfeed or express breast milk for her child by her employer. Employees should not be asked to forgo regular mealtime breaks or asked to work additional time to make up for breaks taken for breastfeeding or expressing breast milk for her child.⁴⁸ A

work environment should remain free from discrimination and should ensure that all employees have equal rights and opportunities regardless of pregnancy or breastfeeding status. Best practices would include ensuring the woman has a dedicated space (i.e. wellness room) for pumping (note – this should not be a bathroom) that would include the following: comfortable chair with supportive arms, electrical outlet, appropriate signage (i.e. ROOM IN USE) to enhance privacy, sink for hand/pump washing, proximity to refrigeration facilities (insulated bag or cooler with ice pack is a safe alternative).^{48,49} To our knowledge, this is the first time a scoping review framework has been used to investigate breastfeeding.

Stage 6: Collating, Summarizing, and Reporting Data

The data will be presented in a predominantly quantitative perspective. SAS® (University Edition, SAS Institute Inc., Cary, NC, USA) software will be used to perform sub-group analysis of each policy variable. This work will take place as of December 2020 and be carried out to completion in 2021. The findings will be reported in a peer-reviewed journal article as well as in a national/international conference setting. Further, we aim to use this data to advocate for breastfeeding surgical resident physicians through the creation and improvement of current breastfeeding policies as applicable. This work aims to help change surgical culture to be more inclusive, which is vital in creating a breastfeeding friendly environment. This would include leadership endorsement of the policy, a culture shift (for example, no repercussions to resident for coming back on a modified schedule or taking breaks for expressing milk), visible educational notices throughout the workplace (i.e. “breastfeeding friendly workplace” notices, common in Canadian public settings), creation of a network of “new moms” within the surgical resident program to ensure there is support and mentorship for new moms returning back to work. Finally, we will use this information to identify research gaps and discuss implications for future research.

Patient and Public Involvement

Patients and the public were not involved in development of this protocol. Future studies will incorporate the resident physician’s perspective.

Ethics and Dissemination:

There is no need for a formal ethical review because no primary data will be collected. To the best of our knowledge, this study is the first to review the literature of breastfeeding policies pertaining to surgical residents in Canada using a comprehensive scoping review methodology described above. We anticipate the study duration to occur from January 1, 2021 to December 31, 2022. We hope to review all breastfeeding policies at the Canadian PGME, individual program, and provincial union level as well any published literature on the topic. The review findings will be submitted to relevant journals and conferences. Finally, we aim to share our results with surgical programs to help change breastfeeding practices for this maternal and infant population.

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Appendix 1: Sample Search Strategy

Ovid MEDLINE: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE®
Daily and Ovid MEDLINE® <1946-Present>

#	Search Statement	Results
1	Education, Medical, Graduate/	29667
2	(house staff or (intern* adj2 (medical or dental))).tw.	7130
3	((residenc* or resident*) adj2 (medical or medicine or surg* or derm* or dental or family medicine or obstetric* or oncolog* or pediatric* or paediatric*).tw.	21521
4	(graduate medical education or pgme or gme).tw.	6332
5	1 or 2 or 3 or 4	56935
6	exp Breast Feeding/	38148
7	(Breast feeding or breastfeeding or ((breast* adj2 (collection* or expression* or pump*)) or chest feeding or lactation)).tw.	75787
8	(Direct feeding or (breast* adj3 nursing)).tw.	644
9	6 or 7 or 8	90136
10	5 and 9	115
11	health planning guidelines/ or exp policy/	161944
12	GUIDELINES AS TOPIC/	40259
13	(guideline* or policy or policies or recommendation*).tw.	796236
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Creation of a Nation-Wide Breastfeeding Policy for Surgical Residents: A Scoping Review Protocol

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Manuscripts

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3 **Creation of a Nation-Wide Breastfeeding Policy for Surgical Residents:**
4 **A Scoping Review Protocol**
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Abstract Word Count: 283 words**Abstract****Introduction:**

Breastfeeding is recommended for the first year of a baby's life due to numerous benefits for both the child and mother. After returning from maternity leave, surgical trainees face extensive barriers to breastfeeding and tend to terminate breastfeeding earlier than guideline recommendations. The aim of this scoping review is to assess existing breastfeeding policies for surgical trainees at the national level including post-graduate medical education ('PGME') offices, provincial resident unions, and individual surgical programs.

Methods and Analysis:

A modified Arksey and O'Malley (2005) framework will be utilized. Specifically, (1) identifying the research question/s and (2) relevant studies from electronic databases and grey literature, (3) identifying and (4) selecting studies with independent verification, and (5) collating, summarizing, and reporting data while having ongoing consultation between experts throughout the process. Experts will include a lactation consultant (AGB), a human resource leader (JI), a health information specialist (ES), two independent coders (NZ, LR), and a board-certified surgeon (JD). This work will take place as of December 2020 and be carried out to completion in 2021.

Ethics and Dissemination:

Ethics approval will not be sought for this scoping review. Research findings will be disseminated through publications, presentations, and meetings with relevant stakeholders.

Strengths and Limitations of this Study

- A scoping review examining breastfeeding policies in Canada has not been published
- A rigorous methodological framework will be used to ensure numerous quality checks
- Extensive use of grey literature will be used to better understand this specific policy landscape
- Only English language articles will be used
- Published studies about breastfeeding policies may be limited

BACKGROUND

Although breastfeeding has been shown to have numerous benefits for both child and mother, it continues to be a challenge for surgical residents. Exclusive breastfeeding is recommended until a baby has reached 6 months of age, after which the continuation of breastfeeding with the addition of solids is recommended for up to one to two years or longer as mutually desired by mother and infant.¹⁻³ The benefits of breastfeeding for the infant include decreased risk of infection in multiple organ systems,^{4,5} sudden infant death syndrome,⁶ allergies,⁷ adolescent and adult obesity,⁸ certain cancers,⁹ and diabetes.¹⁰ Breast milk has been shown to be especially beneficial for preterm infants with greater scores across mental, motor, and behavioral ratings.^{1,11-13} Maternal benefits of breastfeeding include rapid uterine involution, increased weight loss¹⁴ and decreased rates of postpartum depression,¹⁵ type II diabetes,¹⁶ and hypertension, hyperlipidemia, and cardiovascular disease,¹⁷ as well as decreased risk of breast and ovarian cancer.^{18,19}

Physician mothers are a high-risk group for unintended weaning, with less than one third achieving their personal goal of breastfeeding duration.²⁰ Ninety-seven percent of physician mothers report at least one perceived barrier to successful breastfeeding in the workplace.²⁰ Lack of support for expressing breast milk (pumping) is cited as one of the main reasons for discontinuing breastfeeding prematurely.²⁰⁻²³ A Canadian study based out of Newfoundland and Labrador found that specialist physicians breastfed their babies for shorter periods than their generalist counterparts.²⁴ Physicians who reported longer maternity leaves, dedicated lactation areas, and accommodating schedules (both time to pump and/or shorter working hours) were more likely to breastfeed for at least 12 months post-partum and reach their personal breastfeeding goals.²⁰⁻²³

Breastfeeding challenges are magnified for surgical resident physicians.^{20,25-28} The workplace culture, workplace setting (time spent predominantly in the operating room or emergency department), long hours, and traditionally male dominated field (70.6% of all Canadian surgeons are male²⁹) makes breastfeeding especially difficult. Furthermore, surgical residents are at increased risk of preterm delivery.^{30,31} Breastmilk is particularly important for preterm babies, as laid out by the American Association of Pediatric breastfeeding.¹ At six months, non-obstetrical and gynecology ('OBGYN') surgical residents were found to be breastfeeding significantly less (41%) than their OBGYN counterparts (59%, $p < 0.01$).³² General surgery residents felt that their role as "resident" was primarily responsible for not allowing them to meet their breastfeeding goals.³³ Multiple studies have suggested that the lack of breastfeeding policies is a hinderance to meeting breastfeeding goals for all residents.^{22,23,27,28,32} Breastfeeding policies pertain both to breastfeeding a baby directly and expressing milk (also known as 'pumping').

Scoping reviews have been used in the development of policies that address suicide prevention in children and adolescents,³⁴ improve postnatal care,^{35,36} improve interventions to reduce frailty in the elderly,³⁷ and reduce waiting times for elective surgery.³⁸ To our knowledge, this scoping review is the first examining breastfeeding policies for surgical residents.

The purpose of this protocol is to describe the scoping review methodological approach that will guide the completion of this review. We aim to identify and summarize breastfeeding policies in the published and grey literature using a modified Arksey and O'Malley framework.³⁹⁻⁴¹ The outcome of the scoping review will be used to develop a comprehensive national

breastfeeding policy for surgical residents.

METHODS AND ANALYSIS

An integrated Arksey and O'Malley (2005)³⁹ and Levac et al (2010)⁴⁰ protocol will be used similar to an article recently published by one of the authors.⁴¹ The protocol includes six stages and will be discussed at length below.

Stage 1: Ongoing Consultation

Consultation between relevant stakeholders will commence at the beginning of the process and continue throughout the study duration.³⁹⁻⁴¹ Four consultants have been selected with unique knowledge bases: a lactation consultant for her breastfeeding expertise, a human resource specialist to help weigh in on the available policies, a board-certified surgeon to provide knowledge on the practicality of breastfeeding policies, and a health information specialist to assist in ensuring a thorough literature search.

Stage 2: Identify the Research Question/s

Levac et al (2010)³⁶ defines the research question as being broad in nature with a clear scope of inquiry and a defined outcome. Thus, our research question is: what are the Canadian national breastfeeding policies for surgical resident physicians? Specifically,

- a) what are published breastfeeding policies for surgical resident physicians?
- b) what are the publicly/privately available breastfeeding policies at the post-graduate medication education (PGME) offices?
- c) what is included in the collective agreements at the provincial resident union level on the breastfeeding rights of residents?
- d) what are the breastfeeding policies at the hospital and divisional levels, nationwide?
- e) if no/minimal information is found on the Canadian national stage, what are the available breastfeeding policies in top US schools for surgical resident physicians?

Second, of these studies and policies that exist, what details do the policies cover? Specifically, location of breastfeeding or expressing breastmilk, accessories/equipment to facilitate breastfeeding or expressing milk (for example, a fridge to store expressed breast milk, a hospital-grade pump), timing and duration of breaks, support for residents, breastfeeding rights and others. These variables were chosen with the guidance of the lactation consultant (AGB). By better understanding the available breastfeeding policies for surgical residents, we can advocate for more comprehensive or improvement to existing policies.

Stage 3: Identify Breastfeeding Policies

Identifying relevant breastfeeding policies will occur via four major avenues. First, the health information specialist (ES) will help to define a key article search. Relevant databases will include Ovid MEDLINE, Embase, Web of Science, and Scopus. Search terms will include combinations of database subject headings (e.g. MeSH, Emtree) and text words for surgical residents, breastfeeding, and policy. The MEDLINE search strategy is found in Appendix 1: Search Strategy Example. A grey literature search will locate all division and PGME breastfeeding policies as well as any information on breastfeeding policies in the resident union collective agreements. A mix of search terms will be used: breastfeeding and resident, nursing, lactation, and breastfeeding

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3 policy to determine if there are any relevant policies. Third, for websites where information is
4 not publicly available, the relevant PGMEs, surgical divisions, and resident unions will be
5 contacted via email requesting access to breastfeeding policies that pertain to surgical residents.
6 This step represents best practice guidelines in scoping reviews.^{42,43} Social media platforms,
7 specifically Dr. Milk, a private Facebook® (2020 Facebook, Menlo Park, CA, USA) group spanning
8 almost 30,000 physician mothers, will be manually searched for any relevant policies;
9 additionally, a post asking for relevant policies will be published. The use of Facebook® (2020
10 Facebook, Menlo Park, CA, USA) groups to study lactation has been done before.²¹ Finally, if
11 minimal/no policies are found, American universities with surgical departments will be queried
12 using similar search parameters as described above. The top 50 American Medical Schools from
13 the QS World University Rankings Top Medical Schools 2020 will be used.⁴⁴ This comprehensive
14 list uses four indicators to rank universities: academic and employer reputations from QS's global
15 surveys as well as research citations per paper and H-index as determined by Elsevier's Scopus
16 database.⁴⁵ The surgical departments and PGME or equivalent and will be contacted directly via
17 email. The searches will be limited to English, with no time restriction.

22 23 **Stage 4: Study Selection**

24 A team approach with two independent coders will be used for study selection. The process will
25 include post-hoc determination of inclusion and exclusion criteria after familiarization of data as
26 suggested by Arksey and O'Malley³⁹. For example, inclusion criteria will be policies that pertain
27 to surgical residents specifying breastfeeding practices. Exclusion criteria may include non-
28 English articles. Additionally, a small pilot will be completed to ensure common understanding of
29 the criteria. The independent coders will meet at the beginning, midpoint, and final stages of the
30 study selection phase, and any disagreements will be resolved by a third party to ensure
31 qualitative inter-rater reliability.⁴⁰ If there are duplicate protocols published from the same
32 institution, the most recent one will be included.

36 37 **Stage 5: Charting the Data**

38 After articles and grey literature have been selected, data extraction will take place using an
39 iterative process with two independent coders for quality control. A pre-formed template
40 completed a priori to data extraction will be used on Excel® (Microsoft Corporation, Redmond,
41 WA, USA). The coding manual will be created to guide template use to ensure both coders are
42 extracting data and coding in the same way. Quantitative data extracted will include source of
43 breastfeeding policy (published or grey literature), residents covered under policy (surgical
44 and/or other specialties), details of policy (timing of work breaks for milk expression, location,
45 accommodation for resident, role of resident, etc). In addition, published articles will include
46 information on authors, journal, year of publication, and study location.

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48 Breastfeeding policies will then be assessed based on their adherence to Human Resource
49 best practices and the Public Service of Ontario Act: an ethical framework for public bodies to
50 determine where policies are deficient.⁴⁶ In addition, any policy should reference the Ontario (or
51 relevant provincial body) Human Rights Commission which prohibits discrimination and protects
52 the rights of pregnant and breastfeeding women.⁴⁷ It is against the law to discriminate against
53 women who are pregnant or breastfeeding.

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According to the Canadian Human Rights Commission, a breastfeeding mother should be provided with enough time to breastfeed or express breast milk for her child by her employer. Employees should not be asked to forgo regular mealtime breaks or be asked to work additional time to make up for breaks dedicated to breastfeeding or expressing breast milk for her child.⁴⁸ A work environment should remain free from discrimination and should ensure that all employees have equal rights and opportunities regardless of pregnancy or breastfeeding status. Best practices would include ensuring women have a dedicated space (i.e. wellness room) for pumping (note – this should not be a bathroom) that would include the following: comfortable chair with supportive arms, electrical outlet, appropriate signage (i.e. ROOM IN USE) to enhance privacy, sink for hand/pump washing, proximity to refrigeration facilities (insulated bag or cooler with ice pack is a safe alternative).^{48,49} Each protocol will be compared against this criteria to determine if they are met. To our knowledge, this is the first time a scoping review framework has been used to investigate breastfeeding.

Stage 6: Collating, Summarizing, and Reporting Data

The data will be presented in a predominantly quantitative perspective. Specifically, we will calculate number (and respective percentages) of total number of policies meeting each policy criteria SAS[®] (University Edition, SAS Institute Inc., Cary, NC, USA) software will be used to perform sub-group analysis of each policy variable. The variables used in the analyses will depend on the content of available policies. This work will take place as of December 2020 and be carried out to completion in 2021. The findings will be reported in a peer-reviewed journal article as well as in a national/international conference setting. Further, we aim to use this data to advocate for breastfeeding surgical resident physicians through the creation and improvement of current breastfeeding policies as applicable. This work aims to help change surgical culture to be more inclusive, which is vital in creating a breastfeeding friendly environment. This would include leadership endorsement of the policy, a culture shift (for example, no repercussions to resident for coming back on a modified schedule or taking breaks for expressing milk), visible educational notices throughout the workplace (i.e. “breastfeeding friendly workplace” notices, common in Canadian public settings), creation of a network of “new moms” within the surgical resident program to ensure there is support and mentorship for new moms returning back to work. Finally, we will use this information to identify research gaps and discuss implications for future research.

The authors realize that a change in policy does not necessarily equate to an actual change in pumping frequency in the workplace, but we are hopeful that this work will be the starting block to allowing more women to feel more comfortable to do so. Further work is required to better understand scheduling constraints, cultural aspects of work, and other factors that may be limiting women’s ability to breastfeed.

Patient and Public Involvement

Patients and the public were not involved in development of this protocol. Future studies will incorporate the resident physician’s perspective.

Ethics and Dissemination:

There is no need for a formal ethical review because no primary data will be collected. To the

best of our knowledge, this study is the first to review the literature of breastfeeding policies pertaining to surgical residents in Canada using a comprehensive scoping review methodology described above. We anticipate the study duration to occur from January 1, 2021 to December 31, 2022. We hope to review all breastfeeding policies at the Canadian PGME, individual program, and provincial union level as well any published literature on the topic. The review findings will be submitted to relevant journals and conferences. Finally, we aim to share our results with surgical programs to help change breastfeeding practices for this maternal and infant population.

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Appendix 1: Sample Search Strategy

Ovid MEDLINE: Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE®
Daily and Ovid MEDLINE® <1946-Present>

#	Search Statement	Results
1	Education, Medical, Graduate/	29667
2	(house staff or (intern* adj2 (medical or dental))).tw.	7130
3	((residenc* or resident*) adj2 (medical or medicine or surg* or derm* or dental or family medicine or obstetric* or oncolog* or pediatric* or paediatric*)).tw.	21521
4	(graduate medical education or pgme or gme).tw.	6332
5	1 or 2 or 3 or 4	56935
6	exp Breast Feeding/	38148
7	(Breast feeding or breastfeeding or ((breast* adj2 (collection* or expression* or pump*))) or chest feeding or lactation)).tw.	75787
8	(Direct feeding or (breast* adj3 nursing)).tw.	644
9	6 or 7 or 8	90136
10	5 and 9	115
11	health planning guidelines/ or exp policy/	161944
12	GUIDELINES AS TOPIC/	40259
13	(guideline* or policy or policies or recommendation*).tw.	796236
14	11 or 12 or 13	912509
15	5 and 9 and 14	45

Appendix 1: Sample Search Strategy

Ovid MEDLINE: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily and Ovid MEDLINE® <1946-Present>		
#	Search Statement	Results
1	Education, Medical, Graduate/	29667
2	(house staff or (intern* adj2 (medical or dental))).tw.	7130
3	((residenc* or resident*) adj2 (medical or medicine or surg* or derm* or dental or family medicine or obstetric* or oncolog* or pediatric* or paediatric*).tw.	21521
4	(graduate medical education or pgme or gme).tw.	6332
5	1 or 2 or 3 or 4	56935
6	exp Breast Feeding/	38148
7	(Breast feeding or breastfeeding or ((breast* adj2 (collection* or expression* or pump*)) or chest feeding or lactation)).tw.	75787
8	(Direct feeding or (breast* adj3 nursing)).tw.	644
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BMJ Open

Creation of a Nation-Wide Breastfeeding Policy for Surgical Residents: A Scoping Review Protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2020-047466.R2
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Primary Subject Heading:	Surgery
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Keywords:	SURGERY, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, MEDICAL EDUCATION & TRAINING, Community child health < PAEDIATRICS

SCHOLARONE™
Manuscripts

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3 **Creation of a Nation-Wide Breastfeeding Policy for Surgical Residents:**
4 **A Scoping Review Protocol**
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51 **Key Words:** breastfeeding, surgery, residency, policy
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54 **Word Count:** 1966 words
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5
6

7 **Competing interests:** There are no competing interests.
8

9 **Contributor Statement:** All authors have made substantive intellectual contributions. NZ, JD
10 were involved in conceptualizing this review. NZ, LR, JI, AGB, ES, JD were involved in writing this
11 protocol. NZ, LR, JI, AGB, ES, JD commented critically on several drafts of this manuscript.
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Abstract Word Count: 283 words**Abstract****Introduction:**

Breastfeeding is recommended for the first year of a baby's life due to numerous benefits for both the child and mother. After returning from maternity leave, surgical trainees face extensive barriers to breastfeeding and tend to terminate breastfeeding earlier than guideline recommendations. The aim of this scoping review is to assess existing breastfeeding policies for surgical trainees at the national level including post-graduate medical education ('PGME') offices, provincial resident unions, and individual surgical programs.

Methods and Analysis:

A modified Arksey and O'Malley (2005) framework will be utilized. Specifically, (1) identifying the research question/s and (2) relevant studies from electronic databases and grey literature, (3) identifying and (4) selecting studies with independent verification, and (5) collating, summarizing, and reporting data while having ongoing consultation between experts throughout the process. Experts will include a lactation consultant (AGB), a human resource leader (JI), a health information specialist (ES), two independent coders (NZ, LR), and a board-certified surgeon (JD). This work will take place as of December 2020 and be carried out to completion in 2021.

Ethics and Dissemination:

Ethics approval will not be sought for this scoping review. Research findings will be disseminated through publications, presentations, and meetings with relevant stakeholders.

Strengths and Limitations of this Study

- A scoping review examining breastfeeding policies in Canada has not been published
- A rigorous methodological framework will be used to ensure numerous quality checks
- Extensive use of grey literature will be used to better understand this specific policy landscape
- Only English language articles will be used
- Published studies about breastfeeding policies may be limited

BACKGROUND

Although breastfeeding has been shown to have numerous benefits for both child and mother, it continues to be a challenge for surgical residents. Exclusive breastfeeding is recommended until a baby has reached 6 months of age, after which the continuation of breastfeeding with the addition of solids is recommended for up to one to two years or longer as mutually desired by mother and infant.¹⁻³ The benefits of breastfeeding for the infant include decreased risk of infection in multiple organ systems,^{4,5} sudden infant death syndrome,⁶ allergies,⁷ adolescent and adult obesity,⁸ certain cancers,⁹ and diabetes.¹⁰ Breast milk has been shown to be especially beneficial for preterm infants with greater scores across mental, motor, and behavioral ratings.^{1,11-13} Maternal benefits of breastfeeding include rapid uterine involution, increased weight loss¹⁴ and decreased rates of postpartum depression,¹⁵ type II diabetes,¹⁶ and hypertension, hyperlipidemia, and cardiovascular disease,¹⁷ as well as decreased risk of breast and ovarian cancer.^{18,19}

Physician mothers are a high-risk group for unintended weaning, with less than one third achieving their personal goal of breastfeeding duration.²⁰ Ninety-seven percent of physician mothers report at least one perceived barrier to successful breastfeeding in the workplace.²⁰ Lack of support for expressing breast milk (pumping) is cited as one of the main reasons for discontinuing breastfeeding prematurely.²⁰⁻²³ A Canadian study based out of Newfoundland and Labrador found that specialist physicians breastfed their babies for shorter periods than their generalist counterparts.²⁴ Physicians who reported longer maternity leaves, dedicated lactation areas, and accommodating schedules (both time to pump and/or shorter working hours) were more likely to breastfeed for at least 12 months post-partum and reach their personal breastfeeding goals.²⁰⁻²³

Breastfeeding challenges are magnified for surgical resident physicians.^{20,25-28} The workplace culture, workplace setting (time spent predominantly in the operating room or emergency department), long hours, and traditionally male dominated field (70.6% of all Canadian surgeons are male²⁹) makes breastfeeding especially difficult. Furthermore, surgical residents are at increased risk of preterm delivery.^{30,31} Breastmilk is particularly important for preterm babies, as laid out by the American Association of Pediatric breastfeeding.¹ At six months, non-obstetrical and gynecology ('OBGYN') surgical residents were found to be breastfeeding significantly less (41%) than their OBGYN counterparts (59%, $p < 0.01$).³² General surgery residents felt that their role as "resident" was primarily responsible for not allowing them to meet their breastfeeding goals.³³ Multiple studies have suggested that the lack of breastfeeding policies is a hinderance to meeting breastfeeding goals for all residents.^{22,23,27,28,32} Breastfeeding policies pertain both to breastfeeding a baby directly and expressing milk.

Scoping reviews have been used in the development of policies that address suicide prevention in children and adolescents,³⁴ improve postnatal care,^{35,36} improve interventions to reduce frailty in the elderly,³⁷ and reduce waiting times for elective surgery.³⁸ To our knowledge, this scoping review is the first examining breastfeeding policies for surgical residents.

The purpose of this protocol is to describe the scoping review methodological approach that will guide the completion of this review. We aim to identify and summarize breastfeeding policies in the published and grey literature using a modified Arksey and O'Malley framework.³⁹⁻⁴¹ The outcome of the scoping review will be used to develop a comprehensive national breastfeeding policy for surgical residents.

METHODS AND ANALYSIS

An integrated Arksey and O'Malley (2005)³⁹ and Levac et al (2010)⁴⁰ protocol will be used similar to an article recently published by one of the authors.⁴¹ The protocol includes six stages and will be discussed at length below.

Stage 1: Ongoing Consultation

Consultation between relevant stakeholders will commence at the beginning of the process and continue throughout the study duration.³⁹⁻⁴¹ Four consultants have been selected with unique knowledge bases: a lactation consultant for her breastfeeding expertise, a human resource specialist to help weigh in on the available policies, a board-certified surgeon to provide knowledge on the practicality of breastfeeding policies, and a health information specialist to assist in ensuring a thorough literature search.

Stage 2: Identify the Research Question/s

Levac et al (2010)³⁶ defines the research question as being broad in nature with a clear scope of inquiry and a defined outcome. Thus, our research question is: what are the Canadian national breastfeeding policies for surgical resident physicians? Specifically,

- a) what are published breastfeeding policies for surgical resident physicians?
- b) what are the publicly/privately available breastfeeding policies at the post-graduate medication education (PGME) offices?
- c) what is included in the collective agreements at the provincial resident union level on the breastfeeding rights of residents?
- d) what are the breastfeeding policies at the hospital and divisional levels, nationwide?
- e) if no/minimal information is found on the Canadian national stage, what are the available breastfeeding policies in top US schools for surgical resident physicians?

Second, of these studies and policies that exist, what details do the policies cover? Specifically, location of breastfeeding or expressing breastmilk, accessories/equipment to facilitate breastfeeding or expressing milk (for example, a fridge to store expressed breast milk, a hospital-grade pump), timing and duration of breaks, support for residents, breastfeeding rights and others. These variables were chosen with the guidance of the lactation consultant (AGB). By better understanding the available breastfeeding policies for surgical residents, we can advocate for more comprehensive or improvement to existing policies.

Stage 3: Identify Breastfeeding Policies

Identifying relevant breastfeeding policies will occur via four major avenues. First, the health information specialist (ES) will help to define a key article search. Relevant databases will include Ovid MEDLINE, Embase, Web of Science, and Scopus. Search terms will include combinations of database subject headings (e.g. MeSH, Emtree) and text words for surgical residents, breastfeeding, and policy. The MEDLINE search strategy is found in Appendix 1: Search Strategy Example. A grey literature search will locate all division and PGME breastfeeding policies as well as any information on breastfeeding policies in the resident union collective agreements. A mix of search terms will be used: breastfeeding and resident, nursing, lactation, and breastfeeding policy to determine if there are any relevant policies. Third, for websites where information is

not publicly available, the relevant PGMEs, surgical divisions, and resident unions will be contacted via email requesting access to breastfeeding policies that pertain to surgical residents. This step represents best practice guidelines in scoping reviews.^{42,43} Social media platforms, specifically Dr. Milk, a private Facebook© (2020 Facebook, Menlo Park, CA, USA) group spanning almost 30,000 physician mothers, will be manually searched for any relevant policies; additionally, a post asking for relevant policies will be published. The use of Facebook© (2020 Facebook, Menlo Park, CA, USA) groups to study lactation has been done before.²¹ To gain access to the private “Dr Milk” Facebook group, a standardized statement of intent will be sent to the group administrators that include the study purpose, the content of our post, and the intention to leave the group once the data has been collected. Finally, if minimal/no policies are found, American universities with surgical departments will be queried using similar search parameters as described above. The top 50 American Medical Schools from the QS World University Rankings Top Medical Schools 2020 will be used.⁴⁴ This comprehensive list uses four indicators to rank universities: academic and employer reputations from QS’s global surveys as well as research citations per paper and H-index as determined by Elsevier’s Scopus database.⁴⁵ The surgical departments and PGME or equivalent and will be contacted directly via email. The searches will be limited to English, with no time restriction.

Stage 4: Study Selection

A team approach with two independent coders will be used for study selection. The process will include post-hoc determination of inclusion and exclusion criteria after familiarization of data as suggested by Arksey and O’Malley³⁹. For example, inclusion criteria will be policies that pertain to surgical residents specifying breastfeeding practices. Exclusion criteria may include non-English articles. Additionally, a small pilot will be completed to ensure common understanding of the criteria. The independent coders will meet at the beginning, midpoint, and final stages of the study selection phase, and any disagreements will be resolved by a third party to ensure qualitative inter-rater reliability.⁴⁰ If there are duplicate protocols published from the same institution, the most recent one will be included.

Stage 5: Charting the Data

After articles and grey literature have been selected, data extraction will take place using an iterative process with two independent coders for quality control. A pre-formed template completed a priori to data extraction will be used on Excel© (Microsoft Corporation, Redmond, WA, USA). The coding manual will be created to guide template use to ensure both coders are extracting data and coding in the same way. Quantitative data extracted will include source of breastfeeding policy (published or grey literature), residents covered under policy (surgical and/or other specialties), details of policy (timing of work breaks for milk expression, location, accommodation for resident, role of resident, etc). In addition, published articles will include information on authors, journal, year of publication, and study location.

Breastfeeding policies will then be assessed based on their adherence to Human Resource best practices and the Public Service of Ontario Act: an ethical framework for public bodies to determine where policies are deficient.⁴⁶ In addition, any policy should reference the Ontario (or relevant provincial body) Human Rights Commission which prohibits discrimination and protects

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3 the rights of pregnant and breastfeeding women.⁴⁷ It is against the law to discriminate against
4 women who are pregnant or breastfeeding.

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6 According to the Canadian Human Rights Commission, a breastfeeding mother should be
7 provided with enough time to breastfeed or express breast milk for her child by her employer.
8 Employees should not be asked to forgo regular mealtime breaks or be asked to work additional
9 time to make up for breaks dedicated to breastfeeding or expressing breast milk for her child.⁴⁸
10 A work environment should remain free from discrimination and should ensure that all
11 employees have equal rights and opportunities regardless of pregnancy or breastfeeding status.
12 Best practices would include ensuring women have a dedicated space (i.e. wellness room) for
13 pumping (note – this should not be a bathroom) that would include the following: comfortable
14 chair with supportive arms, electrical outlet, appropriate signage (i.e. ROOM IN USE) to enhance
15 privacy, sink for hand/pump washing, proximity to refrigeration facilities (insulated bag or cooler
16 with ice pack is a safe alternative).^{48,49} Each protocol will be compared against this criteria to
17 determine if they are met. To our knowledge, this is the first time a scoping review framework
18 has been used to investigate breastfeeding.
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23 **Stage 6: Collating, Summarizing, and Reporting Data**

24 The data will be presented in a predominantly quantitative perspective. Specifically, we
25 will calculate number (and respective percentages) of total number of policies meeting each
26 policy criteria SAS[®] (University Edition, SAS Institute Inc., Cary, NC, USA) software will be used
27 to perform sub-group analysis of each policy variable. The variables used in the analyses will
28 depend on the content of available policies. This work will take place as of December 2020 and
29 be carried out to completion in 2021. The findings will be reported in a peer-reviewed journal
30 article as well as in a national/international conference setting. Further, we aim to use this data
31 to advocate for breastfeeding surgical resident physicians through the creation and
32 improvement of current breastfeeding policies as applicable. This work aims to help change
33 surgical culture to be more inclusive, which is vital in creating a breastfeeding friendly
34 environment. This would include leadership endorsement of the policy, a culture shift (for
35 example, no repercussions to resident for coming back on a modified schedule or taking breaks
36 for expressing milk), visible educational notices throughout the workplace (i.e. “breastfeeding
37 friendly workplace” notices, common in Canadian public settings), creation of a network of
38 “new moms” within the surgical resident program to ensure there is support and mentorship
39 for new moms returning back to work. Finally, we will use this information to identify research
40 gaps and discuss implications for future research.
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45 The authors realize that a change in policy does not necessarily equate to an actual
46 change in pumping frequency in the workplace, but we are hopeful that this work will be the
47 starting block to allowing more women to feel more comfortable to do so. Further work is
48 required to better understand scheduling constraints, cultural aspects of work, and other
49 factors that may be limiting women’s ability to breastfeed.
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52 **Patient and Public Involvement**

53 Patients and the public were not involved in development of this protocol. Future studies will
54 incorporate the resident physician’s perspective.
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Ethics and Dissemination:

There is no need for a formal ethical review because no primary data will be collected. We anticipate the study duration to occur from January 1, 2021 to December 31, 2022. We hope to review all breastfeeding policies at the Canadian PGME, individual program, and provincial union level as well any published literature on the topic. The review findings will be submitted to relevant journals and conferences.

Conclusion

To our knowledge, this study is the first comprehensive scoping review of the literature on breastfeeding policies pertaining to surgical residents in Canada. Extensive use of grey literature will be used to better understand this specific policy landscape. Limitations of our study include the use of English language articles only, as well as a publication bias as only published studies about breastfeeding policies will be included. Our overall goal is to share our results with surgical programs to help bring attention to and advocate for change in breastfeeding practices for this maternal and infant population.

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Appendix 1: Sample Search Strategy

Ovid MEDLINE: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily and Ovid MEDLINE® <1946-Present>		
#	Search Statement	Results
1	Education, Medical, Graduate/	29667
2	(house staff or (intern* adj2 (medical or dental))).tw.	7130
3	((residenc* or resident*) adj2 (medical or medicine or surg* or derm* or dental or family medicine or obstetric* or oncolog* or pediatric* or paediatric*)).tw.	21521
4	(graduate medical education or pgme or gme).tw.	6332
5	1 or 2 or 3 or 4	56935
6	exp Breast Feeding/	38148
7	(Breast feeding or breastfeeding or ((breast* adj2 (collection* or expression* or pump*)) or chest feeding or lactation)).tw.	75787
8	(Direct feeding or (breast* adj3 nursing)).tw.	644
9	6 or 7 or 8	90136
10	5 and 9	115
11	health planning guidelines/ or exp policy/	161944
12	GUIDELINES AS TOPIC/	40259
13	(guideline* or policy or policies or recommendation*).tw.	796236
14	11 or 12 or 13	912509
15	5 and 9 and 14	45