Towards a Pan-Canadian Consensus on Resident Duty Hours

Fatigue, Risk, & Excellence:

Towards a Pan-Canadian Consensus on Resident Duty Hours

June 2013
The National Steering Committee on Resident Duty Hours provided direction, guidance and advice on the *Towards a Pan-Canadian Consensus on Resident Duty Hours* project and the political and strategic context of the project. Co-led by Dr. Kevin Imrie, MD FRCPC, and Dr. Jason Frank, MD MA(Ed) FRCPC, the National Steering Committee was the senior decision making body of the project.

The National Steering Committee included stakeholders from across Canadian postgraduate medical education:

- Association of Canadian Academic Healthcare Organizations,
- Association of Faculties of Medicine of Canada - Postgraduate Deans,
- Canadian Association of Internes and Residents,
- Canadian Medical Association,
- Collège des Médecins du Québec,
- College of Family Physicians of Canada,
- Federal, Provincial, and Territorial Committee on Health Workforce,
- Fédération des Médecins Résidents du Québec, and the
- Royal College of Physicians and Surgeons of Canada (Project Secretariat).

A full roster of National Steering Committee Members is listed in Appendix A.

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Foreword

The *Towards a Pan-Canadian Consensus on Resident Duty Hours* project was launched in March 2012. Bringing together nine key stakeholder organizations and a wealth of experts on the topic of postgraduate medical education in Canada, the project was intended to address the hours worked by Canadian physicians and surgeons in residency training. Inherent to the project’s mandate was a review of the existing evidence related to resident duty hours and the development of a pan-Canadian consensus on a way forward as pertains to this important issue.

From March 2012 until May 2013, significant expertise and energy was devoted to the three key phases of the project. Over the last sixteen months, we have seen the development of unprecedented research on the topic of resident duty hours. We have seen researchers, residents, faculty members, and members of stakeholder organizations come together to debate and discuss crucial questions related to the health and safety of all who work, learn, and are served as patients by the Canadian health care system. We have been inspired by stories of innovation and the clear sense of dedication to the utmost standards of patient care and medical education.

We extend our sincere appreciation to everyone who participated in this project. We are grateful to all of the members and organizations that acted as part of the National Steering Committee on Resident Duty Hours, who provided strategic advice and management to the project. We are appreciative of the hard work and important contributions of all of the working groups. To all who provided insight to our work and who responded to our requests for input, resources, and perspectives with thoughtfulness and vision; thank you!

Just as we recognize the challenges of this project, there is also no doubt in our minds of its timeliness and importance. The purpose of this project was to develop a pan-Canadian consensus on a way forward for resident duty hours in Canada. It is our hope, and our sincere belief, that this project will contribute to the development of strategies and new approaches that will ensure we achieve the best possible standards of health care, medical education, and wellness for the residents that are of crucial importance to the delivery of patient care in Canada.

Jason R. Frank, MD MA(Ed) FRCPC
Kevin Imrie MD FRCPC
Co-Chairs, National Steering Committee on Resident Duty Hours
Executive Summary

In Canada, as in many other jurisdictions worldwide, physicians in training have a dual role of a learner and clinical care provider. The number of hours worked by residents (resident duty hours) are the subject of much national and international debate. In 2012, the *Towards a Pan-Canadian Consensus on Resident Duty Hours* project was launched with two key objectives:

1) To assemble the available evidence on the issue; and
2) To facilitate a national, consensus-building process among educators, governments, policy makers, patient safety experts, and others, to come to a pan-Canadian statement on resident duty hours issues, directions, and best practices.

This report, and the position of the National Steering Committee and six Expert Working Groups, is intended to outline recommendations and a path forward that optimizes patient care and training for the 21st century.

**Project Parameters**

Discussions on resident duty hours represent some of the most important contemporary debates and discussions regarding medical care delivery and medical education. Resident duty hours, and issues surrounding the regulation of those hours, have significant implications for a number of vital domains, including health care delivery, excellence in medical education, and the provision of safe care.

Several key parameters contextualize this project:

- **Patient care is a key driver.** Residents are simultaneously health care providers in a broader patient-care system that is devoted to safe and high-quality, around-the-clock care and are learners undergoing an intense period of academic and professional development. This period is necessary to ensure they are able to provide excellent patient care for generations to come. The provision of safe patient care is a key driver; all of the recommendations made by the National Steering Committee, and any efforts to come to pan-Canadian consensus on resident duty hours, have been developed with attention to safety and are intended to begin and end with the patient.

- **The discussion regarding resident duty hours is embedded within complex and diverse health care and medical education systems.** Across the country, clinical care, community needs, and resident responsibilities vary significantly in teaching communities that encompass a range from, on one hand, large, tertiary care urban centres to small rural and, on the other, remote communities.

- **In Canada, aspects of the working environment, including resident duty hours, are negotiated as part of a collective bargaining process between Provincial Housestaff Organizations and employers (representatives of Hospitals or Provincial Ministries of Health).** This project intends to inform the existing structure in which an array of provincial collective agreements currently dictates the terms under which residents work.
• The findings, principles, and recommendations contained in this report are intended to relate principally to the express purpose of the project, to develop a pan-Canadian standard on resident work hours. However, work conducted throughout this project recognizes there are also impacts on other, interrelated domains such as similar health and wellbeing concerns among faculty members and other health care providers, delivery of care to patients and patient safety, health human resources, workload and measures of health care costs and medical education.

Project Approach

This project was divided into three key phases. The National Steering Committee on Resident Duty Hours provided strategic guidance throughout the project and a series of Expert Working Groups on key topics related to resident duty hours provided evidence and insight.

The project involved the following key activities and research methods to come to the conclusions detailed within:

- **Interviews with National Steering Committee members** – 18 interviews were held with members of the National Steering Committee to engage their insight and perspective on the issues.

- **National Survey of Residents, Postgraduate Deans, Program Directors, and a Sample of Hospital Administrators** – four target audiences were surveyed to assess their perspectives on resident duty hours.

- **Analysis of Current and Historic Collective Agreements** – 76 current and historic Collective Agreements from Canada’s eight Provincial Housestaff Organizations were reviewed.

- **Literature Review** – 38 systematic reviews were targeted for a comprehensive review of the literature pertaining to resident duty hours.

- **Jurisdictional Review** – Four jurisdictions thought to be instructive for the Canadian context were assessed.

- **Six Expert Working Group Commentary Papers** – working groups were engaged to provide insight and input on key themes.

Finally, a two-day Canadian Consensus Conference on Resident Duty Hours brought together 77 experts and stakeholders to discuss resident duty hours in Canada.

**Key Findings on the Context of Duty Hour Regulations in Canada**

Canada has a unique landscape as pertains to resident duty hour regulations. Arguably, the context of resident duty hour regulations in Canada is quite different from other jurisdictions where resident duty hour regulations or changes have recently been enacted. Canada does not have uniform, nationwide legislation governing aspects of the working environment for residents. Instead, all duty hours and all aspects of the working environment for residents are negotiated through contracts established at a provincial or regional level.

The environment in Canada is marked by tremendous historical and geographic variability in the working environments faced by residents. In Canada, contracts governing aspects of the working environment for residents vary significantly depending on the geographic location of work and have seen significant changes as the Collective Agreements have evolved over time.

Canadian deliberations on resident duty hours typically focus principally on the consecutive number of hours worked, rather than total. In the context of policymaking on resident duty hours, decision-makers must be careful to recognize that there is a key distinction between a) the consecutive number of hours worked on any given shift and b) the total number of hours worked over a specified period of time, i.e. the maximum number of hours worked in a
given week or month. In Canada, deliberations pertaining to resident duty hours typically focus on the former, i.e. the consecutive number of hours worked. The evidence and recommendations contained within this report, as well as the work undertaken throughout the project as a whole, is generally consistent with a focus on consecutive, rather than maximum weekly, hours worked by residents.

Key Findings on the Impact of Resident Duty Hours and Resident Duty Hour Regulations

Assessments of the impact of resident duty hours and regulations related to those duty hours are significantly limited by quality evidence, especially evidence directly attributable to the Canadian context, as well as being limited by recognition that all of the key outcomes under consideration are multifaceted and deeply embedded in complex medical education and medical care systems. Finally, these assessments are limited by the inconsistency of intervention characteristics: that is, the implementation of potential interventions or regulations related to resident duty hours take a significant variety of forms and approaches, all of which are anticipated to have varying impacts, advantages, and disadvantages. Recognizing the ongoing evolution of the health care and medical education systems, the ongoing importance of rigorous research and analysis cannot be understated. In order to ensure decisions regarding patient care and residency work environments continue to be informed by the best available evidence, further research regarding the impact of resident duty hours, particularly in light of the unique Canadian context, must be undertaken.

Recognizing these limitations, however, a number of different sources and experts were brought together to reflect on the research. Emergent from this review are seven key findings which reflect the state of the evidence to date:

Traditional duty periods present risks to the physical, mental, and occupational health of residents. In the past, and in some current situations, residents have been scheduled for duty periods of 24 or more consecutive hours without restorative sleep. At the centre of debate regarding resident duty hours have been concerns regarding the negative implications of such hours worked by residents on their physical, mental, and occupational health.

Fatigue impairs cognitive and behavioural performance. There is wide agreement within sleep science literature that sleep deprivation and fatigue exerts significant impacts on cognitive and behavioural performance. The impact on performance, however, varies according to differences between individuals, their level of fatigue, and numerous other factors.

A tired doctor is not necessarily an unsafe doctor. Patient safety is of prime importance in health care delivery. It is incumbent upon the profession to ensure all providers are capable of maintaining the highest standards of safety in their patient care activities. Sleep deprivation is one of a number of factors that are associated with fatigue and fatigue is one of a number of factors that can affect performance. While it is acknowledged that fatigue has significant impairments for cognitive and behavioural performance, the relationship between fatigue, medical errors and the safety of patient care is unclear. Duty hours cannot be considered in isolation. They must be considered as one factor that impacts fatigue-related risk.

There is no conclusive data to show that restrictions on consecutive resident duty hours are necessary for patient safety. Concerns regarding fatigue's impact on patient safety have emerged as a key driver for resident duty hour reforms. However, emerging evidence suggests a mixed or inconclusive relationship between duty hour reductions and patient safety, leading to concerns that restrictions on consecutive duty hours have not had the anticipated impact on this crucial outcome as hoped.

Successful efforts to improve patient safety and resident fatigue will need to be comprehensive, involving not only the regulation of resident duty hours alone. Accepting the fact that resident duty hours are not the sole factor impacting fatigue among residents or patient safety, it necessarily follows that initiatives addressing the regulation
or restriction of resident duty hours alone are unlikely to lead to improvement in these two domains. Instead, a more comprehensive approach to minimizing fatigue-related risk and optimizing performance is needed.

There is no clear evidence that resident duty hour regulations have had a significant positive or negative impact on academic performance. Resident duty hours are training hours for Canada’s physicians and surgeons in training. On one hand, concerns have been raised about the impact of long hours and fatigue on retention of knowledge. On the other hand, the hours of work spent in training by residents represent significant experience for medical education and opportunities for mentorship and supervision. Skill development requires utilization and practice. Research is not yet conclusive on the overall impact of these two very different factors, and is significantly limited by the fact that medical education outcomes are exceptionally multifactorial. As such, it is unclear whether duty hour restrictions to this point have had a significant impact, positive or negative, on educational outcomes overall.

There is evidence suggesting suboptimal patient care and educational outcomes in surgery resulting from the restriction of resident duty hours. Research related to the impact and regulation of resident duty hours highlights differential, heterogeneous outcomes related to resident duty hours in the surgical disciplines. In particular, concerns regarding patient care and medical education seem to emerge more often in the surgical disciplines, procedural disciplines, and disciplines where patient care acuity is highest. Evidence highlights that more work is needed to develop strategies, different approaches, and new models of surgical care and medical education in the context of evolving work hour regulations.

Resident duty hour regulations necessitate reorganization of health human resources deployment and care delivery models. These changes have the potential for impact on the health care system. As residents function in dual capacity as learners and care providers, there are two complementary but distinct tasks and associated sets of costs and benefits involved in resident duty hours. Changes to the consecutive shift length or total maximum hours of work will necessarily result in the reorganization of health human resources deployment and care delivery models that could result in increased, stable, or decreased fiscal pressures on the health care system. All system changes should be made with careful planning and resource allocations to ensure they are designed and implemented to improve the resident experience as well as enhance safety and quality of care. Resident duty hour regulations are often considered with the intention of improved patient safety or quality of care; however, without careful planning and resource allocations, there is a risk that resident duty hour regulations could inadvertently decrease safety and quality of care through factors such as increased handovers, discontinuity of care and decreased trainee supervision.

A Way Forward for Canada

Recognizing that the status quo as pertains to resident duty hours is not acceptable, five key principles for a collective, pan-Canadian response were established and agreed to by the members of the National Steering Committee on Resident Duty Hours. These are:

1. **Residents have inter-related roles as learners and care providers.**

   Duty hours are training hours and are an integral component of the delivery of patient care in the Canadian health care system.

2. **Residents are vital providers in a health care system that is collectively responsible for 24/7 patient care coverage.**

   The Canadian health care system is obligated to provide patient care coverage at all hours of the day, every day. However, it bears recognition and distinction that this is a system-wide responsibility rather than the responsibility of any single health care provider. Residents form an important component of the entire team of providers that has a collective, rather than individual, responsibility to ensure patient care coverage is there when it is needed to guarantee the timely provision of the best care for all Canadians.
3. **Duty periods of twenty four or more consecutive hours without restorative sleep should be avoided.**

In recognition of the risks posed by such duty periods, we suggest they should only be undertaken in rare and exceptional circumstances.

4. **Efforts to minimize risk and enhance safety are necessary and cannot be undertaken by addressing resident duty hours alone.**

Resident duty hours are only one of a multitude of factors that contribute to resident fatigue. To be effective, efforts to improve safety outcomes will need to include other factors in both education and health service delivery such as the improvement of work processes, supervision, and education.

5. **Given the substantial variation in resident training needs, a tailored and rigorous model for resident duty hours and the provision of after-hour care is needed.**

Resident training needs exemplify significant diversity across the country, among disciplines, between rotations and training sites, and across stages of training. Optimizing resident training and patient care requires consideration of a number of unique factors within each rotation. There is no single one-size-fits-all approach that will optimize the education, patient safety, and patient care components of Canada's diverse residency education system.

**Recommendations**

Recognizing that the status quo as pertains to resident duty hours is not acceptable, five key principles for a collective, pan-Canadian response were established and agreed to by the members of the National Steering Committee on Resident Duty Hours. These are:

1. **Recognizing that there are many factors that contribute to resident fatigue, a comprehensive approach to minimize fatigue and fatigue-related risks should be developed and implemented in residency training in all jurisdictions in Canada.**

   1.1 All residency education programs should be required to develop a fatigue risk management plan (FRMP) for residents.

   1.2 Infrastructure should be created and implemented by residency programs to support fatigue risk management as a routine practice through the creation of monitoring and enforcement mechanisms.

   1.3 A national tool-box of fatigue mitigation strategies and techniques should be created. These should be adaptable in a variety of settings and for a variety of disciplines.

2. **Educational approaches should be redesigned to leverage innovations and new approaches, to ensure appropriate training and acquisition of competencies in an era of increasing resident duty hour regulations.**

   2.1 Pilot projects should be developed, supported, and catalogued to consider a range of educational tools and innovative scheduling systems to help ensure residency programs are training in the most appropriate, efficient, and effective manner possible.

   2.2 Residency education must be re-designed in a way that values and maximizes teaching and learning opportunities, and strives to optimize the educational value and clinical utility of all duty hours worked.

   2.3 Guided by best available evidence, simulation experiences should be incorporated into programs as teaching tools, to facilitate more efficient learning and better patient safety outcomes.
2.4 Redesigned residency education should incorporate self-assessment, fatigue management, and handover skills as key curricular components.

2.5 The Royal College, the College of Family Physicians of Canada, and the Collège des médecins du Québec are asked to review their specialty training requirements to allow appropriate flexibility in the organization of training.

3. **Accreditation standards must be adapted to support planned modifications of the content and duration of resident duty, through the enforcement of fatigue risk management activities.**

3.1 Accreditation standards should specify that residency programs must develop, and keep up to date, fatigue risk management plans (FRMPs).

3.2 The requirement to teach effective self-awareness skills as well as effective handover and communication skills should be integrated into accreditation standards.

4. **An inventory of alternate models of scheduling and provision of after-hours care should be created and disseminated to provide alternatives and benchmarks of scheduling and service delivery.**

4.1 A framework for the evaluation of pertinent metrics should be developed and launched to monitor the impact of changes to resident duty hours on the delivery of patient care.

5. **An independent, pan-Canadian consortium devoted to the evaluation of resident duty hours in Canada should be created.**

**Glossary**

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ACGME</td>
<td>Accreditation Council for Graduate Medical Education</td>
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<td>CAIR</td>
<td>Canadian Association of Internes and Residents</td>
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<tr>
<td>CFPC</td>
<td>College of Family Physicians of Canada</td>
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<td>CMQ</td>
<td>Collège des médecins du Québec</td>
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<tr>
<td>EWTD</td>
<td>European Working Time Directive</td>
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<td>FMRQ</td>
<td>Fédération des Médecins Résidents du Québec</td>
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<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
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<td>NSC</td>
<td>National Steering Committee [on Resident Duty Hours]</td>
</tr>
<tr>
<td>PHO</td>
<td>Provincial Housestaff Organization</td>
</tr>
</tbody>
</table>
# Table of Contents

> National Steering Committee on Resident Duty Hours

> Report Writing Team at the Royal College (Project Secretariat)

> Foreword

> Executive Summary
  > Project Parameters
  > Project Approach
  > Key Findings on the Context of Duty Hour Regulations in Canada
  > Key Findings on the Impact of Resident Duty Hours and Resident Duty Hour Regulations
  > A Way Forward for Canada
  > Recommendations
  > Glossary

> 1.0 Introduction to the Towards a Pan-Canadian Consensus on Resident Duty Hours Project
  > 1.1 Project Background
  > 1.2 Project Parameters
  > 1.3 Project Timelines and Activities
  > 1.4 Project Governance

> 2.0 Project Methodology

> 3.0 Key Themes and Findings
  > 3.1 Contextualizing Approaches to the Regulation of Resident Duty Hours
  > 3.2 Assessing the Impact of Resident Duty Hours

> 4.0 A Way Forward for Canada
  > 4.1 National Survey Data on Policy Options for Canada
  > 4.2 Canadian Consensus Conference on Resident Duty Hours
  > 4.3 Recommendations

> References

> Appendix A – National Steering Committee on Resident Duty Hours

> Appendix B – Expert Working Group Membership Lists

> Appendix C – Brief Overview of National Survey Methodology

> Appendix D – Specific Suggested Metrics by Theme Area
The Health Canada-funded *Towards a Pan-Canadian Consensus on Resident Duty Hours* project was launched in March 2012 to develop a uniquely Canadian consensus on issues, directions, and best practices on the issues related to resident duty hours and their regulation. Strategic input on the project was provided by the National Steering Committee on Resident Duty Hours, a collaborative body comprised of stakeholders from across the residency education system.

### 1.1 Project Background

In Canada, as in many other jurisdictions worldwide, physicians in training have a dual role of a learner and clinical care provider. The number of hours worked by residents (physicians in training), both in terms of shift length and maximum hours per week, have significant implications for delivery of care to patients and patient safety, well-being among residents as well as staff physicians and other health care providers, health human resources, workload and related measures of health care costs and medical education.

In recent years, resident duty hours have garnered much national and international attention. Trends in the European Union and the United States towards shortening resident work hours (40-52.5 hours and 80 hours per week, respectively), coupled with the release of the 2009 Institute of Medicine report in the United States focusing on the patient safety literature associated with long working hours, have been key drivers of this debate.

In Canada, the context of resident duty hours and resident duty hours regulation is quite unique. Here, the balance between the dual roles of learner and clinical care provider is currently managed by individual collective agreements across different provincial jurisdictions, with no national standards or principles, leading to significant variability across the country. In light of ongoing national and international debate, a recent arbitration ruling in the province of Quebec, and recognizing that leadership was needed on this important issue within Canada, a collaborative project was launched in March 2012 to come to a pan-Canadian consensus on the issue of resident duty hours. *The Towards a Pan-Canadian Consensus on Resident Duty Hours* project had two key objectives related to the hours worked by Canadian physicians and surgeons in training: first, to assemble the available evidence on the issue and, second, to produce pan-Canadian standards on the complex issues of resident duty hours.

This final project report is intended to synthesize the discussions and deliberations of the multi-year, multi-phase project, and to posit a path forward for the regulation of resident duty hours in Canada.

### 1.2 Project Parameters

Discussions on resident duty hours represent some the most important contemporary debates and discussions regarding medical care delivery and medical education. Resident duty hours, and issues surrounding the regulation of those hours, can have significant implications for a number of vital domains, including health care delivery, excellence in medical education, and the provision of safe care. In light of much national and international debate on the topic, this collaborative endeavour was launched to establish a pan-Canadian consensus on the topic of resident duty hours in Canada’s postgraduate medical education system.
Postgraduate medical education occurs, to a great degree, through the provision of patient care. In Canada, as in many other countries, residents have a dual role as patient care providers and learners. They are simultaneously health care providers in a broader patient-care system that is devoted to providing safe, high quality, around-the-clock care and are learners undergoing the intense period of academic and professional development necessary to ensure they are able to provide excellent patient care for generations to come.

Early on, the National Steering Committee on Resident Duty Hours recognized the utmost importance of patient safety and the provision of safe care at all hours of the day as a key driver for this work. All of the recommendations made by the National Steering Committee, and any efforts to come to pan-Canadian consensus on resident duty hours, have been developed with attention to this, and are intended to have a strong focus on patient care.

In Canada, aspects of the working environment, including resident duty hours, are negotiated as part of a collective bargaining process between Provincial Housestaff Organizations and employers (representatives of Hospitals or provincial Ministries of Health). This project intends to inform the existing structure in which an array of provincial collective agreements currently dictates the terms under which residents work.

In addition, the discussion regarding resident duty hours is embedded within complex and diverse health care and medical education systems. It must be acknowledged that this project was expressly devoted to the development of a pan-Canadian standard on resident work hours and aspects of the residency work and learning environment. The findings, principles, and recommendations contained in this report are intended to relate principally to that objective, although the work conducted throughout this project was intentionally mindful of impacts on other, interrelated domains such as similar health and wellbeing concerns among faculty members and other health care providers, delivery of care to patients and patient safety, health human resources, workload and measures of health care costs and medical education.

Furthermore, across the country, clinical care, community needs, and resident responsibilities vary significantly in teaching communities that encompass a range from, on one hand, large, tertiary care urban centres to small rural and, on the other, remote communities. Such national diversity in health care and medical education adds yet another dimension to the discussion. It is important that any recommendations developed are applicable to a variety of training and care sites.

This report is intended to outline a path forward that optimizes patient care and training for the 21st century.

### 1.3 Project Timelines and Activities

There were three key phases of the *Towards a Pan-Canadian Consensus on Resident Duty Hours* project, which together spanned the period from March 2012-May 2013.
National Steering Committee on Resident Duty Hours

• Fédération des médecins résidents du Québec, and the Royal College of Physicians and Surgeons of Canada (functioning as Project Secretariat).

A full list of members is included in Appendix A.

A cadre of Expert Working Groups were engaged for their insight and perspectives.

Six Expert Working Groups on specific themed, topic areas were engaged to provide written commentary papers. Furthermore, a small committee also sought to develop a glossary of key terms related to resident duty hours in Canada.

The Expert Working Groups were as follows:

• Patient Safety (Chaired by Chris Parshuram)
• Professionalism (Chaired by Shiphra Ginsberg)
• Resident and Faculty Health and Wellness (Chaired by Susan Edwards and Jonathan DellaVedova)
• Medical Education (Chaired by Paul Dagg)
• Health Systems Performance and Health Economics (Chaired by Maureen Shandling)
• Special Considerations for Procedural Disciplines (Chaired by Najma Ahmed)
• Terminology related to Resident Duty Hours in Canada – a working group to define key terms related to resident duty hours (Chaired by Joshua Tepper)
Project Methodology

A mixed-method, multi-phased approach was developed to guide research and analysis throughout the project. The project’s methodology included a number of methods to retrieve and synthesize data:

1. **Interviews with National Steering Committee Members**
   One-on-one, semi-structured telephone interviews were conducted with 18 members of the National Steering Committee, based on the recognition that this committee is comprised of key stakeholders essential to the resident duty hour debate in Canada. These early interviews helped inform the subsequent phases of the project through their provision of a snapshot of the current landscape.

2. **National Survey of Residents, Postgraduate Deans, Program Directors, and a Sample of Hospital Administrators**
   Understanding that resident duty hours is a complex issue, with various opinions across disciplines, jurisdictions, and stakeholder groups, a quantitative survey was administered in fall 2012 to a broad audience. Tailored to four target populations, this survey was developed to elicit feedback and individual perceptions on the following topics: current resident duty hour practices, patient safety, resident well-being, and perceptions of the effect of resident duty hour regulations on resident education, the health care system, and health human resources. Not only does this survey represent a significant data source for the findings contained within this report, but it also addresses the previous paucity of Canadian data collected at a national scale. Preliminary results from this national survey are included, where pertinent, throughout this report. The data, however, should be considered in light of limitations regarding the response rate (28.5%-76.5%, depending on survey group) and other limitations associated with self-report survey data. For a full discussion of the methodology of this survey, please see Appendix C.

   Furthermore, as one of the key achievements of the project, this data set will facilitate scholarly and evaluation endeavours on resident duty hours within Canada.

3. **Analysis of Current and Historic Collective Agreements**
   The Canadian landscape is unique compared with other jurisdictions, as it pertains to resident duty hours. In particular, and in contrast with the United States, Europe and other countries where resident duty hour regulations have been in place for several years, Canada possesses no national legislation or accreditation standards for resident duty hours. Instead, in Canada, regulations concerning resident duty hours are governed by Collective Agreements negotiated between the relevant hospital(s), or provincial government (employer) and the provincial housestaff organizations representing residents (employees). As part of the project, all available Collective Agreements from 1980-present from each provincial housestaff organization were analyzed in terms of aspects of the working environment for residents and approaches to measuring or regulating resident duty hours in Canada. In total, 76 agreements were reviewed.
4. Literature Review

A literature review building on the Institute of Medicine’s Resident Duty Hours: Enhancing Sleep, Supervision, and Safety study, released in 2009, was undertaken to develop an evidence base regarding resident duty hours in Canada. This literature review focused on systematic reviews of the literature to develop a series of key findings that would inform not only this project, but also the future of resident duty hours deliberations in Canada. This literature review focused on six key thematic areas identified in a previously-undertaken scoping review: Patient Safety, Medical Education, Health Systems Performance and Health Economics, Professionalism, Resident and Faculty Health and Wellness, and Procedural Disciplines. These six themes followed to serve as guiding principles for the work of the Expert Working Groups later in the project as well.

5. Jurisdictional Review

As pertains to resident duty hours, the Canadian landscape is unique. In order to contextualize findings and appropriately develop a way forward, it was necessary to undertake a jurisdictional review. This review was intended to assess approaches to the regulation of duty hours in other countries thought to be instructive for the Canadian context due to their similar approach to residency (postgraduate) medical education. However, it was nevertheless recognized that all of the jurisdictions outlined do vary significantly on the basis of their approaches to medical education and training, and their overall infrastructure for health care provision and caution must be taken in application of any results to the unique Canadian context of resident duty hours.

6. Six Expert Working Group Commentary Papers

Over a six-month period beginning in the fall of 2012, six Expert Working Groups undertook the development of commentary papers on key themes related to resident duty hours in order to ensure the consensus-building process was reflective of the diverse expertise of the community of scholars, participants, and stakeholders in residency education. Under the leadership of their chairs, each group worked collaboratively to develop evidence-informed perspectives, suggested metrics for monitoring and evaluation of resident duty hours regulations and recommendations. As in the case of the literature review, these six Expert Working Group commentary papers followed the six themes identified during a preliminary scoping review and used in the literature review for the Towards a Pan-Canadian Consensus on Resident Duty Hours project. These were as follows: Patient Safety, Medical Education, Health Systems Performance and Health Economics, Professionalism, Resident and Faculty Health and Wellness, and Special Considerations for Procedural Disciplines.
3.0 Key Themes and Findings

3.1 Contextualizing Approaches to the Regulation of Resident Duty Hours

Recognizing the importance of analysis within Canada and the experiences of international jurisdictions, the Project Secretariat conducted a review of international approaches to the regulation of Resident Duty hours in the first phase of the project.

Two separate lines of inquiry were undertaken to complete this review:

- Research was conducted on four jurisdictions: the United States, Europe (including the United Kingdom), Australia, and New Zealand.
- Current and historic collective agreements were reviewed for information on specific aspects of the work environment for residents within Canada.

3.1.1 International Regulations and Approaches

All of the jurisdictions outlined in this paper do vary significantly on the basis of their approaches to medical education and training, and their overall infrastructure for health care provision. While these countries’ approaches reflect a multiplicity of approaches to the governance of resident duty hours regulations, it could nevertheless be argued that all of these jurisdictions have an ability to offer valuable insight for the Canadian context of resident duty hours. As such, preliminary implications and considerations for Canada are noted in the paper.

United States

Established and enforced by national, nongovernmental Accreditation Council for Graduate Medical Education (ACGME).

In the United States, formal resident duty hour standards are currently established and enforced by the Accreditation Council for Graduate Medical Education (ACGME), a national, nongovernmental accreditation organization. Under the ACGME, common duty hours standards apply to all ACGME-accredited residency programs in all 130 ACGME-accredited specialties and subspecialties.

Regulations were originally released in 2003, amended in 2011.

The earliest set of national standards for resident duty hours in all specialties came into effect on July 1, 2003, arguably prompted by several factors, most notably concerns regarding patient safety following the death of a young patient named Libby Zion.1 Developed by an ACGME working group, the major provisions of the ACGME standards stipulated

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1 Libby Zion was an 18 year old patient who died in a New York hospital (now known as the New York Presbyterian Hospital). Her death resulted in an investigation, significant media coverage, and the institution of specific regulations that, initially, applied only to residents practicing in the state of New York. In future, however, her case would be seen as an impetus for further, nationwide regulations such as those launched by the ACGME.
restrictions to duty time, moonlighting, and rest periods. In terms of total duty hours, residents were only permitted to work a limit of 80 hours per week, averaged over a four week period. Furthermore, a 24 hour limit on continuous duty time (i.e. shift length) was imposed, although an additional period of up to six hours was permitted for continuity of care and educational activities. Residents were also to be granted “adequate” rest between duty periods. In-house call was limited to once in every three nights, averaged over 4 weeks (“1 in 3” call). Finally, it was stipulated that one day in seven (averaged over four weeks) was to be left free from all patient care and educational activities.

Comprehensive review of the ACGME regulations was undertaken by a consensus committee.

The ACGME promised to revisit the 2003 recommendations within five years of their establishment. At the request of Congress, and under a contract with the Agency for Healthcare Research and Quality, a consensus committee was formed to “synthesize evidence on the relationship of medical duty hours and schedules to healthcare safety” and, further, to develop “strategies to implement optimal resident work hour schedules” (IOM xi). In order to accomplish this task, the committee reviewed stakeholders’ perspectives on the 2003 duty hour limits, as well as data on adherence to the limits and ACGME monitoring practices.

The results of the 2009 review of the first set of ACGME restrictions are published in the landmark Institute of Medicine (IOM) report entitled “Resident Duty Hours: Enhancing Sleep, Supervision, and Safety.” The committee’s conclusions noted that determining how to prevent fatigue, when possible, and how to mitigate it in periods of necessary work was a key priority. The IOM recommended that sleep during extended duty hour periods be allowed and that residents be provided adequate time for recovery sleep while off duty. That is, according to the IOM, residency programs should increase the opportunity for sleep each day, utilize strategic napping and longer sleep periods while on call at work, and increase the number and frequency of days free from work for recovery.²

The IOM’s position was that these changes would strengthen the 2003 ACGME recommendations.

Research and review led to tailored resident duty hours for residents.

A new set of recommendations was developed by the ACGME in consultation with its Council of Review Committee Chairs in light of the IOM’s conclusions. These new recommendations went into effect in July 2011. Most importantly, under these new directives, duty hours are not universal. Instead, they are tailored to the trainee’s level of experience: first-year residents are subject to more restrictive limits on their hours and require added supervision. Under the new regulations, first-year residents can only work a maximum shift of 16 hours plus four hours for transition; all other residents have a maximum of 24 hours plus six hours for transition. Further, moonlighting is also prohibited for first-year residents, whereas it is permitted for all other residents, but included in the 80 hour weekly limit. Additional provisions were also added to stipulate duty-free time between shifts and to prevent home call on free days. However, despite the IOM’s suggestion that the ACGME create a “five-hour protected sleep period” during extended duration shifts, the ACGME did not opt to implement this recommendation. Instead, strategic napping based on patient needs and resident fatigue is strongly recommended during the nighttime hours.

Arguably, the main drivers in the United States were concerns regarding patient safety and an impending threat of legislation.

Although concerns regarding resident wellbeing have been a factor for the ACGME standards, it has been argued that both iterations of the regulations derive their motivation from patient safety and the threat of legislation as principal concerns. Researchers note that impending congressional action and an account published by the Institute of Medicine

² The Institute of Medicine produced a detailed summary of proposed adjustments to then-current ACGME Duty Hour Limits. Please see IOM (2009): 13.
were key motivating factors behind the development of the 2003 regulations. The IOM account, entitled “To Err is Human: Building a Safer Health System,” noted “significant incidents of medical errors resulting in patient mortalities” (IOM 2000). As Dr. Thomas Nasca, Chief Executive Officer of the ACGME confirms, the design of the second iteration of U.S. regulations under the ACGME continue to reflect this concern: “These standards were written specifically to place the patient at the center, not the resident” (As quoted in Krupa 2010).

Prominent scholar and Director of the Sleep and Patient Safety Program at Harvard Medical School, Dr. Christopher Landrigan, notes major problems associated with the ACGME regulations. First, the work hour limits imposed by the ACGME regulations are still much too lengthy (Landrigan 2006). He suggests the following with respect to the ACGME limit that allows more than 24 hours of consecutive work:

Such extreme work hours convey extremely well-documented hazards, and clinical research conducted in recent years has confirmed their risk in medical settings. In both the international community and in other safety-sensitive industries, these work hours would be considered excessive (2006).

This limit was not amended in the most recent iteration of the regulations, with the exception of the 16 hour limit introduced for first-year residents.

Secondly, Landrigan raises concern that the limits of the ACGME are not being adhered to by residents and residency programs. While Landrigan cites in his work several studies which have shown evidence of non-compliance with the ACGME standards, it is also worth noting some aspects of the ACGME approach that may be problematic in this light. For example, the ACGME standards are tied to program accreditation and, as such, compliance is “technically voluntary,” assuming a program is willing to forfeit its accreditation status. The ACGME has threatened to revoke accreditation from programs that do not comply (IOM 2000). A loss of accreditation comes with significant consequences: it would jeopardize hospitals’ ability to sponsor graduate medical education programs and would place at risk approximately $100,000 per resident per year in federal funding received from Medicare3 (Iglehart 2010).

Limitations and concerns regarding the monitoring and enforcement of regulations have been raised in the United States.

Although the penalties for non-compliance may be severe, some concern has also been raised that the ACGME may not have the ability to undertake effective monitoring. This is, as Landrigan aptly points out, a result of the ACGME’s dual status as the agency that collects data on compliance and the agency that is responsible for program accreditation. Landrigan notes that the relationship between these two roles presents a difficult situation akin to a conflict of interest: residents and faculty may be unwilling to disclose violations for fear of their professional livelihood and the status of their program (2006).

Early evidence suggests emerging challenges related to the implementation of the 2011 standards.

A recent article published in the Journal of the American Medical Association provides evidence of the type of literature that is beginning to emerge following ongoing evaluation of the implementation of the 2011 standards. As determined by a longitudinal cohort study undertaken by Srijan Sen et al., the decrease of working hours under the 2011 ACGME standards has shown an “unanticipated increase in self-reported medical errors” and, furthermore, has not shown an improvement in well-being or depressive symptoms, nor has it seemingly prompted an increase in hours of sleep (2013).

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3 Medicare is a social assistance program in the United States. In addition to providing coverage for health care for select demographic groups, Medicare also funds the vast majority of residency training in the United States through both direct and indirect medical education payments and subsidies.
European Union

The European Working Time Directive was applied to trainees in 2009.

In the European Union, resident duty hours are regulated by a specific agreement to which all Member States must abide: this is the European Working Time Directive (EWTD). Under the EWTD, each member state must ensure that every worker is entitled to a limit to the weekly working time, which must not exceed 48 hours on average, including any overtime. While the EWTD came into effect in 1993 for all salaried EU citizens, this legislation did not initially apply to doctors in training. After successful lobbying by European resident groups, an Amending Directive was released in 2000 to stipulate that medical trainees should also be included under the EWTD. This Directive outlined a five-year transition period (commencing August 2004) that would ultimately see residents working a maximum of 48 hours per week. The EWTD was fully applied to doctors in training by August 1, 2009, i.e. sixteen years after it was initially introduced for other types of salaried workers.

Until the overarching directive, there was significant variability between the regulations of individual countries. Prior to the implementation of the EWTD, each European country had different duty hour regulations for its medical residents. For instance, the United Kingdom has had reductions on the hours of “Junior Doctors” since 1991. It was in this year when a publication, “Junior Doctors – the new deal” proposed a maximum limit of 72 hours per week, including at most 56 hours of “actual work” (Tami 2004). On the other hand, Denmark and France did not have any restrictions at all until the implementation of the EWTD (Australian Medical Association 1998).

There is significant variability across the European Union.

While the EWTD regulations are designed as “enforceable laws,” the IOM report points out that monitoring and enforcement of work hour restrictions likely vary across all European countries. As of 2006, France had not delegated the responsibility of enforcing duty hour restrictions and, as a result, compliance rates were not being monitored (Woodrow et al). In Germany, duty hours are enforced by “trade supervisory boards.” These are the same institutions that are responsible for enforcing the duty hours of all employees (IOM 2009).

Research indicates not only significant variability between practices among EU countries, but also a generally low level of compliance. According to a 2010 survey conducted by the British Medical Association, more than half of Junior doctors still work more than 56 hours per week to “fill rota gaps or because of perceived pressure to work additional hours” (BMA 2010). The British Medical Association’s working group on the EWTD has also cited that only Denmark, Germany, and Sweden have been reported as compliant with the requirements (The Lancet 2010).

New Zealand

A longstanding concern with Resident Duty Hours is evident in New Zealand.

New Zealand has had regulations on the duty hours of residents since 1985. This effort is a feat which has earned New Zealand a reputation of “leading the world in reducing the work hours of junior doctors,” according to Dr. Christopher Landrigan (2006). Stipulating regulations much earlier than any of the other jurisdictions detailed in this report is suggestive of a longstanding concern with resident fatigue and work hours.

Governed by a collective agreement to which employers are bound.

In New Zealand, the work hours of resident physicians in training are governed by the Multi-Employer Collective Agreement. These regulations specify a maximum number of hours per week (72), although they also include a notation suggesting that a maximum of 60 hours per week is a “desirable goal.” A maximum limit on consecutive number of hours per day is set at 16. Furthermore, these
regulations also stipulate minimum time off: eight hours minimum between duty periods, every second weekend free of duty, and a minimum of two consecutive days off required after working five nights in a row.

New Zealand, however, has also included a regulation that permits seven 10-hour night shifts during a single rotation. The IOM, in particular, has noted that this stipulation is seemingly out of line with their otherwise restrictive regulations (2009).

**Australia**

Duty hour limitations are advisory, not binding, in Australia.

Australia does not have any regulated limits on resident duty hours (Landrigan 2006). That is, guidelines specifying maximum work hours are “advisory, as opposed to being binding rules” (IOM 2009). Nevertheless, they include a stipulation that work in excess of 50 hours per week would put the resident at “significant risk” of fatigue and work in excess of 70 hours would put the resident at “higher risk” (Australian Medical Association 2005). There is no designated enforcement body for work hours in Australia (IOM 2009).

A comprehensive fatigue management plan helps minimize risk in Australia.

In the absence of authoritative regulations, the Australian Medical Association has promoted a comprehensive fatigue management plan and “encourages circadian principles.” According to Landrigan (2006), such principles include a) the avoidance of frequent shift changes, b) a “clockwise” rotation system when rotation is needed, i.e. day shift to evening shift to night shift to day shift, and finally c) minimizing consecutive nights on duty.

Interestingly, despite the lack of firm regulations, a study undertaken by the Australian Medical Association showed that even among junior doctors at “high risk” of fatigue, the “longest consecutive work period averaged 16 hours, an average considerably below that in the U.S. and Canada, if higher than that in Europe,” (Landrigan 2006). A review of factors conducted by the IOM may provide an explanation, i.e. that work hours for residents in Australia “may reflect a culture with expectations that resident hours should be [no higher than] those of other workers in the population” (2009).

**3.1.2 Resident Duty Hours in Canada**

Canada has a unique landscape as pertains to resident duty hour regulations.

Arguably, the context of resident duty hour regulations in Canada is quite different from that of the other jurisdictions explored within this report. First of all, the Canadian postgraduate medical education system is organized very differently than the other jurisdictions explored. Here in Canada, more autonomy given to individual medical schools in the administration of residency programs, and few, if any national legislation or regulations exist to govern postgraduate medical education, with the exception of accreditation standards set by the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada (CFPC), and the Collège des médecins du Québec (CMQ).

As a result, Canada does not have uniform, nationwide legislation governing aspects of the working environment for residents, such as shift length (weekly or consecutive maximum), hours of rest between shifts, and call frequency for residents working in hospitals. Instead, all duty hours and all aspects of the working environment are negotiated through contracts established at a provincial or regional level. Such an agreement differs to the approach taken in other jurisdictions (i.e. legislation under the EWTD in Europe or the accreditation standards in the United States under the ACGME). Since the 1970s, Provincial Housestaff Organizations (PHOs) have been in place in each region in Canada, functioning largely as resident unions or employment unions as well as functioning as professional
associations. These organizational bodies are responsible, through collective bargaining, for negotiating resident-physician working conditions with the respective employer (government and/or hospital representatives). Together, the PHOs and employers establish contracts which govern all aspects of the employer-employee relationship, including stipulations regarding wages, benefits and duty hours. In Canada, no legislation exists at the federal or provincial level to govern resident duty hours.

Currently, there are eight PHO associations in Canada, each conducting separate negotiations within their province or region. Seven of these eight residency associations are represented by an overarching body, the Canadian Association of Internes and Residents (CAIR). In addition, residents working in the province of Quebec are represented by the Fédération des Médecins Résidents du Québec (FMRQ), an organization which functions independently of, but collaboratively with, CAIR.

An environment marked by tremendous historical and geographic variability in the working environments faced by residents.

Given the provincial basis of resident contracts, there is not only tremendous historical variability as the contracts evolved over time, but also significant variability in the current working environment faced by residents depending on the geographic location of their work in the nation.

These changes are summarized briefly below:

<table>
<thead>
<tr>
<th>ASPECT</th>
<th>SUMMARY OF FINDINGS</th>
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<tr>
<td><strong>Maximum consecutive shift length</strong></td>
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</table>
  - Significant evolution: many early contracts from the 1980s did not specify a specific maximum. Most collective agreements are currently consistent in stipulating a maximum shift length of approximately 24-26 hours.  
  - In most cases, provisions are granted to create dedicated “handover” time to transfer patient care responsibilities.  
  - Several notable exceptions include the province of Quebec (16 hour maximum in house call due to a 2011 arbitration ruling) and two PHOs (FMRQ and PARI-MP) have negotiated agreements with lower maximum shifts for residents working in the Emergency Room. |
| **Maximum hours per week**      |  
  - In many historic agreements from the 1980s, maximum hours per week were not specified nor stipulated. Even today, two of the most recent agreements merely specify that the resident should work a “reasonable amount” during a week, and does not specify a maximum at all.  
  - Considerable variation across the country, from 60 hours per week at the lowest end to 90 at the highest.  
  - Significant variations are also noteworthy: some PHOs allow averaging of hours and there is variation in what is “counted” as part of these hours. |
| **Hours of rest between shifts** |  
  - Many would argue that the allowance regarding hours of rest between shifts has important implications for the ability of a resident to recuperate between shifts, whether they are separated by a day or more. Currently, only three of the eight PHOs specify a minimum number of hours of rest between consecutive shifts for all residents. Instead, some contracts specify time off every 3 to 14 days, but these clauses would not necessarily preclude a resident from being scheduled for back-to-back shifts with little rest time between. |
National deliberations on resident duty hours typically focus principally on the consecutive number of hours worked, rather than total.

In the context of policymaking on resident duty hours, decision-makers must be careful to recognize that there is a key distinction between (a) the consecutive number of hours worked on any given shift and (b) the total number of hours worked over a specified period of time, i.e. the maximum number of hours worked in a given week. In Canada, deliberations pertaining to resident duty hours typically focus on the former, i.e. the maximum consecutive shift length.

As noted above, this has been an area of significant evolution in the collective agreements throughout Canada. Many early contracts from the 1980s did not specify a specific maximum consecutive shift length. Currently, most collective agreements are generally consistent in stipulating a maximum shift length of approximately 24-26 hours. However, as detailed below, a recent arbitration ruling has resulted in a much shorter maximum in-house shift length in the province of Quebec.

The evidence and recommendations contained within this report, as well as the work undertaken throughout the project as a whole, is generally consistent with a focus on consecutive, rather than maximum weekly, hours worked by residents.

Recent arbitration rulings in two Canadian provinces continue to contribute to ongoing evolution in the landscape of resident duty hours.

Resident Duty Hours in Quebec

In 2009, a grievance was filed in the province of Quebec against the McGill University Health Centre on the basis that 24 hour shifts violate the Canadian Charter of Rights and Freedoms’ protections regarding employment conditions and jeopardize patient safety.4 As a result,

4 Full details regarding this decision can be found in the arbitration record available online: <http://www.fmrq.qc.ca/PDF/2011-06-07_Griefhorairesgarde_DecisiondeMeJPLussier_VA.pdf>
residents in Quebec have transitioned to new call duty systems in-keeping with the conditions of the arbitration ruling. Recognizing that this transition to a new model of call duty is very recent and that a comprehensive understanding of the changes will not yet be available, some preliminary lessons and insights from the case study in Quebec are provided and detailed below for reflection. However, it must be noted that the arbitration ruling in Quebec concerns only consecutive hours of in-house call duty. According to the award given by Jean-Pierre Lussier in June 2011, residents cannot work more than 16 hours consecutively on an in-house call shift. As a result, the provincial government and the resident organization, FMRQ, negotiated a collective agreement through collective bargaining to bring work conditions in line with this arbitration ruling. The award, however, did not posit any new rules for out-of-house call and did not stipulate any regulations on the total number of hours per week.

Human rights are emerging as key drivers of the Quebec arbitration ruling.

The dual impacts of patient safety and human rights were noted throughout the arbitration record, and served as frequent considerations throughout the course of the hearing. Human rights figured more prominently, however, in the decision made by Lussier and served as the principal driver. The arbitration award was based upon Lussier’s conclusion that 24 hour in-house calls violate the Canadian Charter of Rights and Freedoms and the Quebec Charter of Human Rights and Freedoms in that such shifts affect the resident and patient’s right to life and personal security, and fair and reasonable conditions of employment for the resident.

The transition to a new call duty schedule is ongoing.

While a few programs in Quebec had already utilized a call duty schedule that was compatible with the arbitration ruling prior to its award, a majority of programs have transitioned to the new limit, which posits that any in-house call duty shift must not be longer than 16 consecutive hours. As with any major transition, it should be recognized that this shift will require an adaptation period for all, including residents, practicing physicians, and any other health care professionals. Given how recently this change happened, it should also be recognized that scholarly evaluation of the impacts is somewhat limited and that longitudinal assessment of the impacts of the changes is not possible yet.

An overall consensus regarding the impacts of the arbitration ruling has not been forthcoming. Emergent from this transition are challenges and benefits for patient care and resident health and wellbeing.

The province-wide shift to a 16 hour shift maximum was a significant undertaking within Quebec. To date, early analysis of these changes highlights divergent views from various stakeholders and individual residents and residency programs regarding the impacts of the arbitration ruling and associated transitions to shorter, consecutive call duty periods in the province of Quebec.

Key challenges regarding the implementation of the award ruling have been cited. All programs have been required to undertake adjustments to the deployment and scheduling of resident staff in order to accommodate the changes. In some cases, the initial transition to the new model has been challenging, resulting in resistance from residents and faculty. This suggests that more work may be needed to alleviate some scheduling and educational challenges to ensure an effective and smooth transition in high-acuity patient care disciplines. Generally speaking, there are concerns that the sixteen hour maximum may have actually created a potential increase in the number of shift changes within some programs. If this is the case, it has the potential to lead to frequent alternations from day to night shift that may be disruptive to a residents’ sleep schedule and, through the frequent handover of patient care, may increase the potential for medical errors due to a lack of clear communication between care providers and/or care teams. Recognizing the importance of strong handover processes, the FMRQ notes that education in this domain has been, and will continue to be, an increasingly important aspect of the residency curriculum.
As in all major changes, the fortitude, innovation, and thoughtfulness of individual programs has been a key factor in the transition period. Many residency programs have been willing to utilize this unprecedented Canadian arbitration ruling as a prompt for broader innovations and positive changes in the realm of residency education that may result in even greater successes as a result of the transition.

**Resident Duty Hours in Nova Scotia and the Maritimes**

Additionally, a recent arbitration ruling in Nova Scotia is also expected to have implications for resident duty hour regulations within Canada. In March 2013, an arbitration award was handed down in Nova Scotia, resolving certain employment terms at issue between parties to the collective agreement governing medical residents in the Maritime Provinces (the Professional Association of Residents in the Maritime Provinces (PARI-MP) and six named health care institutions in the Maritime Provinces). Amongst its findings, the Board awarded annual wage increases to medical residents in the Maritime Provinces of 1.5% every six months over the three year term of the renewal agreement, and supported certain PARI-MP proposals with respect to maternity, parental, educational and special leave.

In considering the changing legal landscape surrounding resident duty hours, it is worthy of note that the Board’s decision (written by the chair of the Board, and supported by the PARI-MP nominee), asserted that excessive hours of work was a key underlying issue in the arbitration, albeit not directly addressed by the parties, and a principal driver in the Board’s decision-making. The Board specifically denoted its award as a call to action to all institutions engaged in the shaping and management of the Canadian health care system. The dissenting opinion by the Employer nominee concluded that excessive hours of work was not an issue before the Board and that the ruling was unfair because the parties did not have an opportunity to lead evidence. While a comprehensive analysis of the situation in Nova Scotia is beyond the scope of the *Towards a Pan-Canadian Consensus on Resident Duty Hours* project, the National Steering Committee nevertheless asserts that it signifies evidence of ongoing negotiations and the legal implications of deliberations concerning the hours of work in residency training.

**Ongoing monitoring of the impacts of evolutions in residency education will be of crucial importance in order to ensure that any future regulations in Canada are evidence-based.**

Early evidence suggests that some programs are implementing pilot projects and some researchers are launching tools intended to evaluate the impacts of the new call duty schedules. Recognizing that the new approach is unprecedented in Canada, it is the position of the National Steering Committee that evaluation of these changes will be instrumental to ensuring optimal patient care, patient safety, and training outcomes. Furthermore, these changes should be evaluated using an evaluation framework that would establish national data sets and would posit the ability to undertake comparisons between jurisdictions.

### 3.1.3 A Glossary for Resident Duty Hours in Canada

Given the distinction between certain interventions used for changes to resident duty hours and associated regulations, and significant variability across jurisdictions with respect to commonly used terminology, such as workday, home call, moonlighting and night float, an assessment of key terms pertaining to resident duty hours was undertaken.

Through the project, consideration of key terms was undertaken to better understand the types of work included in “resident duty hours” and to inform the below glossary. The work found that while certain terms varied widely across jurisdictions, there was general consensus with respect to other terms.
These findings are summarized below:

There was general consensus with respect to the inclusion of clinical and formal academic activities as components of “resident duty hours”.

“Resident duty hours” was identified as a complex concept with various components. There was general agreement, however, with respect to the inclusion of clinical and formal academic activities as components of this term. Notably, most sources for the term were American, and Canadian sources focused on the mechanics of regulation, such as maximum hours of work per week or in-house call frequency.

“Service” and “education” were found to have largely implicit definitions.

“Service” and “education” were generally found to have implicit rather than overt definitions. For example, some of the PHOs’ collective agreements contained discussion of the service/education dichotomy, and included language such as care to patients, knowledge and collaboration. It was recommended by the working group conducting the study that the dichotomy between these two terms, as part of the resident’s dual role, should be deemphasized, given that service typically involves educational components, and education exists both outside and within the context of clinical care. Instead, these terms have been considered in the glossary as a gradient, as summarized in the Royal College’s The Resident’s Dual Role as Learner and Service Provider White Paper.

The terms “moonlighting” and “restricted registration” varied considerably across jurisdictions.

Across jurisdictions, these terms were understood, interpreted, applied and defined differently. Given the lack of consensus around these terms, it was recommended that they be removed, and that the glossary instead refer to “work outside a residency program with an educational or limited license”, and “work outside a residency program with an independent license, i.e. primary certification.”

General consensus around “workday”, “home call”, “in-house call”, “call conversion” and “night float.”

Definitions for these terms were found to be largely consistent across jurisdictions. There were nevertheless some slight variations and nuances across jurisdictions. For example, Canadian sources for “in-house” call typically included more information than American sources on the mechanics of regulation. Additionally, “night float”, largely an American term, was defined in terms of the rationale for implementation – as a scheduling tool to ensure adherence to regulations, and out-of-house call was found to be a strictly Canadian term. Harmonization of common definitions was used to define these particular terms.

The terms “graduated license”, “shift work”, “after-work hours” and “total medicine time” were used infrequently.

These terms were rarely used and often only in particular jurisdictions or areas. Graduated license was identified only in the Canadian context, whereas shift work, when used on occasion in the Canadian context – generally within certain PHOs collective agreements – was defined in a vague manner: “e.g. emergency department, intensive care.” Further, after-work hours and total medicine hours were rarely used within both Canadian and American contexts. These terms proved more challenging to define.

The principal goal of this study was to inform the creation of a glossary of terms, which will be instructive in working towards a pan-Canadian statement on resident duty hours. Creating a common understanding of the meaning of certain key terms will be beneficial for framing future policy discussions around resident duty hours reforms.
As a key outcome of the project, a proposed glossary to be used in decision-making and deliberations regarding resident duty hours is recommended as follows:

<table>
<thead>
<tr>
<th>TERM</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>Resident duty hours</td>
<td>All time spent in scheduled clinical and academic activities related to the residency program, that is: patient care (both inpatient and outpatient), administrative duties relative to patient care, provision for transfer of patient care, time spent in-house during call activities, and scheduled learning activities, such as organized teaching sessions. Duty hours do not include reading and time spent away from the duty site.</td>
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</tbody>
</table>
| Service/ Education                        | **Service:** The act of professional and clinical interaction with patients, and the provision of clinical care, including indirect care; an important medium through which residents learn; and a critical part of residency education.  
**Education:** In the context of residency education, it is the application of knowledge, collaboration, and discovery leading to the development of skills and attitudes necessary for residents to become caring, competent physicians capable of serving patients and the society in which they function. Education includes formalized/structured and informal/unstructured activities, both within and outside the clinical care environment. |
<p>| Graduated license                         | A medical license subject to terms, limitation, conditions or restrictions. Often applied, within Canada, to international medical graduates, and also known as a “provisional license.”                                                                                                                                                                |
| Work outside a residency program with an educational or limited license | Work that is performed by a resident outside their residency program’s formal activities, with an educational or limited license. Referred to as “moonlighting” and/or “restricted registration” in some jurisdictions.                                                                                                                                               |
| Work outside a residency program with an independent license | Work that is performed by a resident outside their residency program’s formal activities, with an independent license. This term applies to subspecialty residents who have their primary certification and have a full license to practice medicine in their primary discipline. May be referred to as “moonlighting” in some jurisdictions. |
| Workday                                   | A regular workday is typically operationalized as work performed from Monday through Friday, generally between 0700 hours and 1800 hours and not typically exceeding twelve (12) consecutive hours.                                                                                                                                                   |
| Home call                                 | Clinical services, or immediate availability for such service, provided by a resident beyond the regular duty hours, where the resident is not required to remain in the hospital for that period of time. May result in the resident returning to the hospital as required, which is often regulated (see “Call conversion”). Home call is also referred to as “out-of-house call” and “out-of-hospital call.” |</p>
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<tr>
<th>TERM</th>
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<tr>
<td><strong>In-house call</strong></td>
<td>Where the resident is scheduled to be immediately available to provide clinical services beyond the regular duty hours, and is required to remain in the hospital for the scheduled period of time. Also referred to as “in-hospital call”.</td>
</tr>
<tr>
<td><strong>Call conversion</strong></td>
<td>The retroactive change to a resident's schedule from “home call” to “in-house call” applied when the resident on home call is required to come in to work in the hospital. Typically operationalized in terms of more than four (4) consecutive hours on-site during the call period, of which more than one full hour is past midnight and before 0600.</td>
</tr>
<tr>
<td><strong>Shift work</strong></td>
<td>A typical scheduling practice in emergency departments and intensive care units, where physicians succeed each other in blocks of scheduled time, according to a certain pattern, in order to provide service 24 hours a day, seven days a week.</td>
</tr>
<tr>
<td><strong>After work hours</strong></td>
<td>Work that typically takes place outside the regular workday (see “Workday”).</td>
</tr>
<tr>
<td><strong>Night float</strong></td>
<td>A residency rotation in which one or more residents are assigned to night duty, as a form of coverage, ensuring continuity of care and compliance with duty hour restrictions. Typically operationalized as involving consecutive nights of 10-12 hours or alternate nights of longer shifts (sometimes beginning at or after 20:00 Monday through Saturday and 22:00 on Sunday). Also referred to as “night call in an establishment” in some jurisdictions, e.g., Québec.</td>
</tr>
<tr>
<td><strong>Total medicine hours</strong></td>
<td>A PAIRO specific term, which reflects that the service and learning requirements of residency extend considerably beyond the sum of regular clinical duties and on-call duty hours. These substantial requirements can vary between programs, but generally include such responsibilities as engaging in research, achieving proficiency in all CanMEDS roles, preparing for cases, studying for exams, self-directed learning, preparing rounds presentations, teaching, administrative duties, and travel time associated with residency training. Viewing hours as “total medicine time” highlights the unique aspects of residency that impact fatigue and performance.</td>
</tr>
</tbody>
</table>
3.2 Assessing the Impact of Resident Duty Hours

One of the key objectives of this project involved the collection and synthesis of literature on key themes related to resident duty hours in order to assess the impact of resident duty hours.

There are several parameters that must be acknowledged as guiding principles and details that impact upon the findings articulated as a result of this project. First, while there exists a great deal of literature on resident duty hours, this literature is of varying quality, is sometimes divergent, and is often undertaken within the United States and Europe. Much of the literature is not always reflective of, or entirely applicable to, resident duty hours within the unique Canadian landscape. Second, all of the key areas of interest studied through this project are multifaceted and deeply embedded in complex medical education and medical care systems. Any changes to resident duty hours alone may be difficult to isolate. Third, the implementation of potential interventions or regulations related to resident duty hours take a significant variety of forms and approaches, all of which are anticipated to have varying impacts, advantages, and disadvantages.

Recognizing these three significant challenges associated with undertaking a literature review in this context and in light of the significant value of contributions from stakeholders, key authorities and experts to the overall process, the Towards a Pan-Canadian Consensus on Resident Duty Hours project prioritized a few activities to collate a meaningful assessment and to ensure efforts to reach a consensus building process were reflective of the diverse expertise of the community of scholars, participants, and stakeholders in residency education. Synthesized from the findings of our assessment and collation of systematic literature reviews, the work of six Expert Working Groups, national, Canadian-specific survey data, and the deliberations of experts at a two-day conference, seven key findings are emergent from the research undertaken throughout the project. These are as follows:

1. Traditional call models present risks to the physical, mental, and occupational health of residents.

Resident duty hours have been the subject of much national and international debate for a variety of reasons. At the centre of this debate are concerns raised regarding “traditional” call models, that is, those approaches that have not been subject to recent reform, regulation, or restriction. Typically, “traditional” call models are those which include 24 hours or more of consecutive work without restorative sleep. One of the major concerns raised is that those schedules may have negative implications for the physical, mental, and occupational health of those who provide patient care. Such concerns have served as the impetus for reforms both within international and national domains. Most notably, the European Working Time Directive was launched throughout Europe with the express purpose to minimize excessive hours of work for all employees, not just those working in settings with a patient safety or clinical focus. In the Canadian provinces of Quebec and Nova Scotia, recent arbitration awards cite the conclusion that traditional call models are detrimental to resident health and wellbeing.

Data regarding resident health and wellness is generally conceptualized in three domains: mental health, physical health, and occupational health. In each of these domains, it is generally recognized that there are profound intra-individual differences that lead to differential impacts of fatigue for particular individuals. With respect to mental health, studies do show that long work hours are associated with burnout (Fletcher et al. 2011; Bhanaker and Cullen 2003; Lefebvre 2012; and Mountain et al. 2007), thus negatively impacting quality of life (Henning, Hawken, and Hill 2009).

Regarding physical health, physical symptoms which threaten resident’s health have been associated with long work hours. The impact of sleep deprivation on
physical symptoms is well documented and supported by evidence (Lefebvre 2012; Peets and Ayas 2012) and its tendency to increase the risk of such health concerns as obesity, diabetes, and cardiovascular disease is supported by systematic research (Czeisler 2009; Bhanaker and Cullen 2003). Personal safety is also cited as a major risk of extended work hours, with systematic reviews concluding that residents who work longer hours do experience greater risks in having motor vehicle accidents (Lockley et al. 2006, Parthasarathy 2005) and percutaneous (needlestick) injury (Mountain et al. 2007). When surveyed as part of this project, 70% of resident respondents said that they do experience prolonged sleep deprivation. The majority (67%) of residents use caffeine to help them stay awake, with a very small percentage using other medications to help them stay awake. Sleep medications are used by 20% of resident respondents. However, the majority of resident respondents noted they did not experience near miss motor vehicle collisions (75%), actual motor vehicle collisions (98%), a personal workplace accident/injury (98%) over a four week period.

2. **Fatigue impairs cognitive and behavioural performance.**

There is wide agreement within sleep science literature that sleep deprivation and fatigue exerts significant impacts on cognitive and behavioural performance. Many systematic reviews are homogenous in their conclusions that sleep deprivation has a negative impact on performance (Bhananker and Cullen, 2003; Czeisler, 2009; Ellenhoven, 2005; Heins and Euerle, 2002), citing “profound” impairments in cognitive and behavioural performance, and a negative impact on cognitive processing (Ellenhoven, 2005).

The reasons for such negative impacts are described in the following terms: sleep deprivation is linked to negative impacts on job performance given fatigue’s detrimental effects on “interactions with patients and their families, empathy, motor skills, efficiency, accuracy and medical error rates” (Papp, Miller, and Strohl 2006). Sleep deprivation is also explained as causing emotional and cognitive “disturbances” that may impact performance (Tyssen and Vaglum 2002).

There are other implications of fatigue’s detrimental impacts on performance. First, recognizing that sleep deprivation and fatigue has detrimental impacts on medical error rates, scholars speak about the concerns that such impacts might negatively impact patient safety. Here, as is discussed directly below, the evidence is less clear. Second, there is a concern that the detrimental impacts of fatigue may also have important implications for cognitive processing and, thus, the retention of knowledge: an especially worrisome outcome given that duty hours are not only service hours, but also training hours crucial to the provision of safe, talented health care by those individuals in years to come. Such impacts are discussed in terms of fatigue’s impact on academic performance below (see sixth finding).

3. **A tired doctor is not necessarily an unsafe doctor.**

Patient safety is of primary importance in health care delivery. It is incumbent upon the profession to ensure all providers are capable of maintaining the highest standards of safety in their patient care activities. One of the main points of deliberation as pertains to resident duty hours concerns the relationship between resident duty hours, fatigue, and patient safety.

Despite literature regarding the impact of fatigue on performance, there is a lack of clear consensus on the relationship between fatigue and medical errors and the safety of patient care. This lack of consensus is perhaps owing to the vast multiplicity of factors that come to bear upon patient safety. Fatigue is a crucial factor with the potential to cause harm if it leads to medical errors, certainly, but the ultimate impact of fatigue upon patient safety is complicated by other impacts thought to influence patient safety. While it might seem intuitive that doctors working fewer hours would be
less tired and make fewer errors, leading to improvements in patient care outcomes, other related influences may be more important and may exert even more influence on the overall outcome of patient safety. An increase in and the quality of handovers between physicians, the level and quality of supervision, and other external factors such as schedules, continuity of care provided by a multidisciplinary team, and even differences amongst institutions in health care delivery, are all contributing factors to overall patient safety and patient outcomes (Henning, Hawken and Hill 2009). Notably, some of these influences may be of increased concern if resident duty hour regulations or changes result in increased handovers or if they have a negative impact on continuity of care.

Even when it is acknowledged that fatigued residents can make more errors and have more accidents, the follow-through impact of such accidents on the safety of patient care is not definitive. While the IOM acknowledged that while fatigued residents can make more errors and have more accidents, the institute’s panel of experts felt the data was less conclusive on the impacts to patients. As noted, there are “simply too few data” to reliably estimate the extent to which these errors affect patients and cause them harm (IOM 2009).

The national survey launched as part of this project included questions intended to solicit information on residents’ self-report perceptions of medical errors over a four week period. When asked about the last four week period, 89% of resident respondents noted that they had not made a “serious medical error with potential to harm a patient due to sleep deprivation” and an even greater 98.5% of resident respondents noted that they had not made a “serious medical error that actually harmed a patient due to sleep deprivation.” Such data, although admittedly and potentially reflective of limitations as a result of being sourced from self-report data from a limited time frame, nevertheless corroborates literature positing similar conclusions.

4. There is no conclusive data to show that restrictions on consecutive resident duty hours are necessary for patient safety.

As noted within this report, resident duty hour regulations are a source of much national and international debate. Concerns regarding fatigue’s impact on patient safety have emerged as one of several key reasons that resident duty hour reforms were enacted within such jurisdictions as the United States.

Resident duty hour reforms have emerged as a chosen tool to improve or guard patient safety. However, in fact, emerging evaluation of this tool has shown that it may not be remarkably effective. The following domains are most frequently used when assessing the relationship between consecutive duty hours and patient safety: harmful errors, adverse events, clinician errors, pre-clinical errors and errors in laboratory tests. Many of the systematic reviews assessed throughout this project concluded that duty hour reform has had little or no impact on standards of care for patients or outcomes of patients (Moonesinghe et al. 2011; Olson, Drage, Auger 2009; Shenants, Anderson Shenants, Rotondo 2006).

There are, of course, limitations to this research. Patient safety is an incredibly complex outcome and admittedly it is very difficult to assess resident duty hour reforms as a unique impact for the purposes of accurate and directive study. In particular, several studies stated that the lack of data of sufficient quality (Moonesinghe et al. 2011) or quantity (Baldwin et al. 2011; Curet 2008; Fletcher et al. 2004; Lockley et al. 2006; Mountain et al. 2007) made it difficult to make conclusive statements on the relationship between reduced duty hours and patient safety.

Given that evidence to date is not uniform in the actual impacts of consecutive duty hours or of the preventative impacts of new reforms on patient safety, confounding factors that may be exacerbated by resident duty hour reforms should be of particular concern for policymakers.
5. **Successful efforts to improve patient safety and resident fatigue will need to be comprehensive, involving not only the regulation of resident duty hours alone.**

Patient safety and fatigue among residents are two outcomes that are complex and multi-factorial, recognized as being impacted by not only resident duty hours, but a host of other factors. In the case of fatigue, the IOM report identifies other factors such as “a work and learning environment with insufficient staffing and heavy workload, inadequate supervision, mental health, level of skill and knowledge, complexity of the patient’s clinical condition, communication breakdowns between team members, language barriers with patients, and inherent system failures” (IOM 2009) as contributing to overall patient safety. There is no evidence to support the efficacy of focusing only on fatigue, to the exclusion of all other potential factors, in the interest of improving patient safety. Although resident duty hours is often spoken of, and considered to function as, a proxy for fatigue, it must be noted that fatigue, too, is similarly impacted by a variety of broad domains including sleep, workload, circadian rhythm disruption, and individual factors. As such, some of the factors noted above (such as insufficient staffing, heavy workload, and lack of supervision) may be relevant to overall fatigue levels, as will other factors such as specific aspects of scheduling (i.e. time of shift) that may impact upon residents’ fatigue.

Accepting the fact that resident duty hours are not the sole factor impacting fatigue or patient safety, it necessarily follows that initiatives addressed only to the assessment, regulation, or restriction of resident duty hours are unlikely to singlehandedly prompt positive outcomes in these domains. Resident duty hours cannot be treated as a panacea for incurring positive improvements in patient safety and fatigue.

6. **There is no clear evidence that resident duty hour regulations have had a significant positive or negative impact on academic performance.**

It is incumbent upon the residency education system to train professionals who are highly skilled, competent physicians and surgeons able to provide excellent patient care. Academic performance and outcomes during training must be recognized as markers on a process of development towards the ultimate goal of residency education: to prepare trainees for independent practice and to ensure Canada’s physicians and surgeons are well-prepared to provide the level of care that the nation’s populace deserves.

Given the importance of medical education outcomes, an assessment of the impact of resident duty hours on academic performance is crucial. The consecutive length or amount of resident duty hours is one of a significant number of factors that may exert influence on medical education. In addition to assessing the impact of resident duty hours and the impact of fatigue on retention of knowledge, proxy outcomes pre- and post- regulations concerning resident duty hours must also be considered. These factors include training opportunities, learning objectives, the educational richness of tasks, examination scores, and operative exposure or experience. Perhaps owing to these multiple factors, current evidence related to the singular impact of resident duty hours on academic performance has not shown that regulations alone have had a significant impact, positive or negative, on educational outcomes overall.

In the realm of medical education, one of the major concerns regarding resident duty hours is its impact on fatigue and, subsequently, retention of knowledge and thus academic outcomes. Indeed, some studies have shown that changes to, and restrictions of, resident duty hours are thought to enhance cognitive processes complimentary to learning and memory.
consolidation (Czeisler 2009; Ellenbogen 2005; Papp, Miller and Strohl 2006). However, yet again, the challenge of multifactorial relationships emerges here too, confounding this conclusion. It must be acknowledged that the overall impact of duty hours and regulations pertaining to medical education are premised upon the impact of a variety of other factors such as the relationship between resident duty hours and fatigue, the level of supervision both pre- and post- any change in aspects of the working environment, the residents’ own aptitude, a potential change in clinical hours, among others. Perhaps unsurprising given such a convergence and the “interconnectedness of themes and elements of the clinical learning and care environment,” (Philibert 2012) literature related to medical education is mixed and inconclusive (Boex and Leahy 2003; Fletcher, Reed, Arora 2011; Levine, Adusumili, Landrigan 2010; Moonesinghe et al. 2011; Philibert 2012). In some cases, examination scores are used as an outcome measure of the effectiveness of the training system. Several reviews using examination scores showed mixed data (Fletcher et al. 2011; Fletcher, Reed, and Arora 2010; Peets and Ayas 2012). Similarly, the IOM report concluded that the full effects of the 2003 ACGME regulations on medical education were unclear five years after their launch (2009).

Furthermore, some residency education programs have also launched innovations in medical education teaching and learning within their program, many times in tandem with resident duty hour restrictions. Such factors and changes complicate researchers’ ability to target and isolate the impact of resident duty hours regulations and changes alone.

As in the other five thematic areas, but perhaps additionally so in the realm of medical education and resident duty hours, it must be acknowledged, too, that there is a paucity of Canadian data in this area and existing research is not generally of high methodological quality.

7. There is evidence suggesting suboptimal patient care and educational outcomes in surgery resulting from the regulation of resident duty hours.

Research related to the impact of resident duty hours highlights differential, heterogeneous impacts on several outcomes across different disciplines. Although, as detailed, outcomes across all disciplines are typically somewhat mixed and inconclusive for the six themed areas under consideration through this project, it must be noted that areas of concern (evidence suggestive of suboptimal impacts on education and patient care) are heightened and more frequently reported in surgery and within in-patient high acuity units such as in the Intensive Care Unit environment. This literature is worthy of additional research and assessment, as it suggests that more work may need to be done to develop strategies to preserve access to key learning opportunities and ensure continuity of patient care in the context of work hour regulations.

In particular, outcomes related to patient care and medical education may be differentially impacted in surgery compared to non-surgical disciplines. As pertains to patient care, systematic reviews have not shown improvements in a typical measure of patient care, mortality, for surgical patients as a result of duty hour restrictions (IOM 2009; Jamal et al. 2012). However, the Jamal systematic analysis did report an increase in adverse events in patients undergoing emergency surgery. Furthermore, a body of literature has emerged highlighting a detrimental impact of resident duty hour regulations on patient level outcomes in surgery. (Hoh 2012; Dumont 2012; Kaderli 2012; Poulse 2005; Brown, Cooke, et al. 2009; Gopaldas, Chu et al. 2010).

Within the domain of education and training, procedural disciplines suffer greater challenges (Moonesinghe et al. 2011). This challenge is related to the nature of surgical services as tied to busy in-patient services, delivering emergency care at unpredictable hours and technical mastery and judgement requiring time on task. Some evidence suggests declining exposure to operative cases
since the introduction of restricted resident duty hour regulations (Kairys et al. 2009; Sabada and Urso 2011). Other researchers have not found a relationship between procedural volume and limitations on duty hours (Jamal et al. 2011; IOM 2009), although some of this literature has been focused primarily on procedural volume, to the exclusion of appropriate case mix, perioperative time, and non-operative didactic opportunities, among other issues (IOM 2009). Also essential is trainees’ exposure to unusual, infrequent and emergency surgical procedures. A more tailored approach may be more appropriate.

Innovations in high acuity patient care and medical education could support rigorous training and resident health and wellbeing, and patient care. Such innovations may include:

- Greater protection of resident sleep at night,
- Use of validated simulation curricula that could shorten the learning curve for routine and repetitive parts of operations,
- Competency-based training and evaluation,
- Re-organization of operating room resources to ensure greater capacity for urgent surgery during the day,
- Optimization of time spent in the clinical environment to favour emphasis on high yield educational activities and delivery of medically necessary care, especially during junior residency.

In Canada, and as part of the survey launched as part of this project, 73% of surgical resident respondents believe that their current opportunities for procedural training are adequate or very adequate. While this is promising for the future of resident duty hours in Canada, it remains a common concern that future work hour limitations have the potential to impact training opportunities and, thus, outcomes in surgical education. Similar concerns may be relevant for other specialties including high acuity in-patient units such as Intensive Care Units.

8. Resident duty hour regulations necessitate reorganization of health human resources deployment and care delivery models. These changes have the potential for impact on the health care system.

As residents function in dual capacity as learners and care providers, there are two complementary but distinct tasks and associated sets of costs and benefits involved in resident duty hours. Broadly, these include the resources required to provide teaching and education, and the important services provided by a resident in a hospital setting, under appropriate supervision. Changes to the consecutive shift length or total maximum hours of work will necessarily result in the reorganization of health human resources deployment and care delivery models in order to accommodate the changes. Recognizing that the exact nature of such reorganizations and the net result on resource needs would depend, subsequently, on the exact adjustments made to resident duty hours, the impact of resident duty hours reforms could be potentially significant. Furthermore, it should be noted that resident duty hours changes have the potential for both upward and downward fiscal implications for health systems. That is, factors and changes implicated by resident duty hour reforms could lead to more expensive or less expensive care. For example, restrictions on work hours may result in pressures to hire additional health care providers with increased resource requirements. On the other hand, it is recognized that such fiscal impacts could be reduced by other factors: care could be provided more efficiently in well-designed teams or as a result of “lean” process redesign or other cost-savings initiatives that would lend other efficiencies to the system. The net impact of resident duty hours reforms is, as such, difficult to anticipate.

Evidence from other jurisdictions suggests that efforts should be made to reassess and reorganize the model of health care delivery, launching innovations in the models of coverage used, the utilization of other health
care professionals, and a consideration of the nature of scope of work, particularly as pertains to work undertaken in after-hours contexts. For example, the United Kingdom’s “Hospital at Night” programs were developed in response to the requirements of the European Working Time Directive and were primarily intended to address off-hours coverage. Such initiatives involved the use of high performing multidisciplinary teams, workflow redesign to eliminate non-essential work from nights and weekends, consistent handover and scheduling protocols, the use of automated triage tools to trigger escalating levels of care, and increased availability of senior staff. Evidence demonstrates strong outcomes as a result of the Hospital at Night program, seen most impressively in the maintenance or improvement of typical clinical outcomes ranging from mortality rates to adverse events and surgical complications (Mahon et al. 2005). Recognizing that there are significant differences in the health care systems of Canada and the United Kingdom and such improvements may not be directly transferable, the Hospital at Night program nevertheless should be seen as an impetus and motivation. Discussions regarding resident duty hours should be used to catalyze innovations and redesign.

All system changes should be made with careful planning and resource allocations to ensure they are designed and implemented to improve the resident experience as well as enhance safety and quality of care. Resident duty hour regulations are often considered with the intention of improved patient safety or quality of care; however, without careful planning and resource allocations, there is a risk that resident duty hour regulations could inadvertently decrease safety and quality of care through factors such as increased handovers, discontinuity of care, and decreased trainee supervision. Especially concerning in and of itself, such a risk warrants particular attention in an era marked by increased pressures on the fiscal resources of the health care system and a parallel commitment to deliver responsibly-managed and exceptionally safe patient care to Canadians.
As noted throughout this report, resident duty hours have been the subject of much national and international debate and, as a result, a number of policy options have been pursued by a variety of jurisdictions. In some countries, such as the United States, binding legislation has been enacted by a national, nongovernmental organization (ACGME). In other countries such as Australia, regulations are advisory rather than binding and focus on fatigue mitigation and the minimization of fatigue-related risks.

This project was intended to undertake two interrelated objectives seen as vital to the future of resident duty hours: first, to collate the available evidence and, second, to come to a pan-Canadian consensus on a way forward for the future of resident duty hours in Canada. As such, we now turn our attention to the assessment of various policy-based options and solutions that might be suitable given the evidence collated as part of the project. There are an array of potential policy options and solutions that have been considered in the Canadian context, ranging from new models of care provision, adjustments to the number of consecutive or total hours of work by residents, new approaches to postgraduate medical education, among other changes.

**4.1 National Survey Data on Policy Options for Canada**

There is no doubt that deliberation on the future of resident duty hours are of critical importance. A number of mechanisms were engaged to assess perspectives and perceptions of the issue in order to ensure that discussions at the Canadian Consensus Conference were reflective of national opinion and that, subsequently, the recommendations contained within this report were informed. In addition to the work of the six diverse and dedicated Expert Working Groups, a national survey was also sent to four populations to obtain data on perceptions of resident duty hours from stakeholder perspectives. One of the key domains of the survey was on policy options, the results of which are summarized here. A description of the methods utilized in this survey, response rates, and key limitations for consideration of the survey results is included in Appendix C.

Data collected as part of this survey showed support for a national standard on resident duty hours in Canada. According to the survey results, over half of respondents in each respondent group thought that there should be a national standard on resident duty hours:

- Surgical residents (65.4%) and program directors (57.7%)
- Other residents (80.8%) and program directors (76.8%)
- Postgraduate deans (77.0%)
- Hospital administrators (85.0%)
Data collected as part of the survey also showed support for an approach that is tailored to individual disciplines:

Respondents were also asked to indicate what strategies should be considered in response to further duty hour regulations. The top requested strategies across all target populations were:

- Competency-based medical education;
- New models of after-hours care provision; and
- Increased utilization of other health professionals.

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<th>SURVEY GROUP</th>
<th>TOP STRATEGIES</th>
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<td></td>
<td>Decrease non-educational admin. tasks</td>
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<tr>
<td>Residents</td>
<td>55.6%</td>
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<tr>
<td>Program Directors</td>
<td>46.0%</td>
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<tr>
<td>Postgraduate Deans</td>
<td>54.0%</td>
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<tr>
<td>Hospital Administrators</td>
<td>52.0%</td>
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4.2 Canadian Consensus Conference on Resident Duty Hours

On March 14 and 15, 2013, the Canadian Consensus Conference on Resident Duty Hours was held in Ottawa, Ontario. This conference provided an opportunity for the presentation of key findings from the first two phases of the project as well as an opportunity for discussion and deliberation on fundamental issues related to resident duty hours and to establish a way forward for Canada as pertains to the regulation of those hours given project outcomes and progress to date.

Conference participants included members of the National Steering Committee on Resident Duty Hours and its nine stakeholder organizations, members and chairs of the six Expert Working Groups, and a number of representatives from other stakeholder organizations.

During this two-day event, attendees examined the potential impacts that changing resident duty hours and contemporary events in Canada could have on patient safety, medical education, residents and faculty health and wellness, professionalism and health systems and health service delivery. Attendees also engaged in specific, small group discussions on topics related to fatigue risk management, global metrics, new models of health care and education, supervision, and a way forward for balancing the inherent tension between “flexibility” and rigor.

A selection of key themes articulated by attendees of the conference included the following:

- The status quo as pertains to resident duty hours is unacceptable.
- A one-size-fits-all approach to resident duty hours will not be effective or appropriate in Canada. A tailored approach must nevertheless be rigorous.
- Implementing a meaningful approach to resident duty hours will require broader consideration of other factors such as workload, fatigue mitigation and management, models of care provision and models of residency education.
- The timelines of negotiations and deliberations pertaining to resident duty hours present an ideal opportunity to be proactive in the development of a way forward in the nation.
- Lessons can be learned from other jurisdictions which have launched resident duty hours regulations, but assessments must recognize the inherent complexities posed by Canada’s unique jurisdictional context of resident duty hours and health care delivery systems.
- Further, ongoing, and systematic evaluation of resident duty hours in the Canadian context is necessary.

At the conclusion of the Canadian Consensus Conference on Resident Duty Hours, the National Steering Committee on Resident Duty Hours began a process to develop key principles and recommendations for consensus on issues pertaining to Resident Duty Hours in Canada. Outlined below, these are intended to be reflective of the diversity of opinion, evidence, and input received during the Canadian Consensus Conference on Resident Duty Hours.

Conference Outcomes: Principles for Consensus on Resident Duty Hours in Canada

Recognizing that the status quo as pertains to resident duty hours is not acceptable, five key principles for a collective, pan-Canadian response were established and agreed to by the members of the National Steering Committee.

These principles are emergent from the committee’s recognition that issues pertaining to resident duty hours cannot be viewed in isolation of their consequences across the breadth of the health care and medical education systems. Furthermore, these principles are intended to respect the existing context of resident duty hours.
negotiations in Canada, in which aspects of the residency work environment are negotiated by recognized resident organizations referred to as Provincial Housestaff Organizations.

As the rationale for the recommendations proposed by the committee, these five principles are intended to provide background and context to the recommendations and to summarize the findings of the National Steering Committee on Resident Duty Hours. These principles are as follows:

1. **Residents have inter-related roles as learners and care providers.**

   Duty hours are training hours and are an integral component of the delivery of patient care in the Canadian health care system.

2. **Residents are vital providers in a health care system that is collectively responsible for 24/7 patient care coverage.**

   The Canadian health care system is obligated to provide patient care coverage at all hours of the day, every day. However, it bears recognition and distinction that this is a system-wide responsibility rather than the responsibility of any single health care provider. Residents form an important component of the entire team of providers that has a collective, rather than individual, responsibility to ensure patient care coverage is there when it is needed to guarantee the timely provision of the best care for all Canadians.

3. **Duty periods of twenty four or more consecutive hours without restorative sleep should be avoided.**

   In recognition of the risks posed by such duty periods, we suggest they should only be undertaken in rare and exceptional circumstances.

4. **Efforts to minimize risk and enhance safety are necessary and cannot be undertaken by addressing resident duty hours alone.**

   Resident duty hours are only one of a multitude of factors that contribute to resident fatigue. To be effective, efforts to improve safety outcomes will need to include other factors in both education and health service delivery such as the improvement of work processes, supervision, and education.

5. **Given the substantial variation in resident training needs, a tailored and rigorous model for resident duty hours and the provision of after-hour care is needed.**

   Resident training needs exemplify significant diversity across the country, among disciplines, between rotations and training sites, and across stages of training. Optimizing resident training and patient care requires consideration of a number of unique factors within each rotation. There is no single one-size-fits-all approach that will optimize the education, patient safety, and patient care components of Canada’s diverse residency education system.

### 4.3 Recommendations

The recommendations outlined below represent the collective vision of the National Steering Committee on Resident Duty Hours, regarding an approach to issues pertaining to, and impacted by, resident duty hours in Canada.

Recognizing that a comprehensive approach is necessary in order to enhance safety and wellness outcomes, the National Steering Committee posits these recommendations with the intention that they are implemented in a systematic and comprehensive manner, rather than any in isolation.

1. **Recognizing that there are many factors that contribute to resident fatigue, a comprehensive approach to minimize fatigue and fatigue-related risks should be developed and implemented in residency training in all jurisdictions in Canada.**

   The creation of a fatigue management strategy acknowledges that decreasing resident fatigue is multi-faceted, and therefore should expand beyond regulation of duty hours to examine workload, individual
physiology and needs, supervision, and support. Specific enabling actions and strategies for this recommendation are as follows:

1.1 All residency education programs should be required to develop a fatigue risk management plan (FRMP) for residents.

The risk of fatigue varies between individuals and it is heavily influenced by situational factors such as workload, hours of wakefulness, and both acute and chronic sleep deprivation. With this in mind, the fatigue risk management plan will need to be developed by the residency education program, recognizing that individual training sites would be engaged to provide insight. The purpose of the FRMP would be to identify and mitigate fatigue-related risk at hospitals and universities, ultimately aiming to ensure optimal outcomes in patient safety, medical education, and resident health and wellness.

- Individual FRMPs should be developed and ratified by relevant stakeholders using established principles of risk and safety management.
- Individual FRMPs should include the total number of consecutive hours of scheduled work, as well as workload assessments and response and exposure to fatigue. Evidence suggests that the number of hours of sleep obtained is a crucial factor, perhaps even more telling than the number of hours worked, for an accurate assessment of acute fatigue-related risk.
- Individual FRMPs should also be monitored and reviewed internally and externally on a regular basis using appropriate evidence-based performance measures, and recalibrated and/or updated to reflect outcomes of the review process and/or evidence-based advances in fatigue science.
- A representative national sample of individual FRMPs should be systematically reviewed by a new national monitoring body every two years in order to:
  - Determine how well fatigue risk has been managed nationally, and
  - Develop best practice principles and guidance materials that better support the development and continuous improvement of FRMPs across the Canadian health care system.

1.2 Infrastructure should be created and implemented by residency programs to support fatigue risk management as a routine practice through the creation of monitoring and enforcement mechanisms.

- Assessment of average workload intensity for residents, sleep and duty-period associated fatigue should be undertaken, while ensuring consideration of the specific nature of the particular discipline and its training needs.
- Regular, personalized risk assessments should be undertaken to support targeted application of mitigation strategies or, where feasible, ineligibility for duty and modified duty responsibilities for individuals. Personalized risk assessments are needed to help ensure that residents know their own vulnerability and mitigating risks.
- Risk assessments should ensure that residents are fit to practice and that any additional activities, including clinical work undertaken outside of the formal curriculum with an educational or limited license, does not interfere with residents’ academic progress, safety, or wellbeing.
- Within each residency program and with the engagement of individual training sites, strategies should be developed as part of fatigue risk management to actively promote wellness within the training program and workplace.
These strategies should include mental health crisis response and guidelines for specific resident groups deemed to be at a higher risk.

- Each residency program should also be required, as part of their accreditation standards and their fatigue risk management plans, to launch an educational curriculum to teach residents about self-awareness regarding their fit for practice and performance at any given time.

- In each jurisdiction, an appropriate enforcement mechanism, such as a local fatigue officer, should be engaged to provide oversight of workload and scheduling metrics with support from a new central Canadian organization for the evaluation of resident duty hours.

1.3 A national tool-box of fatigue mitigation strategies and techniques should be created. These should be adaptable in a variety of settings and for a variety of disciplines.

- This national tool box could include a repository of evidence-based resources such as, for example, template fatigue management plan, evidence-based and valid risk assessment tools. The tool box would be intended to assist with the creation of individual FRMPs, providing a collection of evidence and models.

2. Educational approaches should be redesigned to leverage innovations and new approaches, to ensure appropriate training and acquisition of competencies in an era of increasing resident duty hour regulations.

In an era of increasing resident duty hour regulations, the deployment and continued use of new educational approaches is especially imperative to ensure robust training outcomes for residents and residency programs across Canada. Deliberations concerning resident duty hours provide an unprecedented and powerful opportunity to reform and redesign educational approaches by testing innovations and strategies that might be utilized in residency education. Specific suggestions for educational redesign in residency education are provided below:

2.1 Pilot projects should be developed, supported, and catalogued to consider a range of educational tools and innovative scheduling systems to help ensure residency programs are training in the most appropriate, efficient, and effective manner possible.

Recognizing that all residency hours are valuable educational opportunities, pilot projects that incorporate principles of flexibility, effective supervision, teaching, and mentorship, while minimizing and mitigating fatigue-related risk, should be supported in local contexts. Lessons learned and best practices should be catalogued and evaluated using a national framework so that innovation can be shared and replicated and local champions of innovation can be fostered.

2.2 Residency education must be re-designed in a way that values and maximizes teaching and learning opportunities, and strives to optimize the educational value and clinical utility of all duty hours worked.

Supervision, teaching, and mentorship must be undertaken in an efficient manner that maximizes learning opportunities and enhances educational value. Service demands, and in particular those that are after-hours, must “not interfere with the ability of the residents to follow the academic [residency] program.”5 Residents’ participation in patient care during night-time hours must include a consideration of the provision of medically necessary care for patients and families, as well as residents’ involvement in high-impact and valuable training opportunities.

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5 This principle is presently expressed as one component (#5.1) of the conjoint B3 standards for residency education as distributed by the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada and the Collège des Médecins du Québec.
2.3 Guided by best available evidence, simulation experiences should be incorporated into programs as teaching tools, to facilitate more efficient learning and better patient safety outcomes.

Simulation may be broadly defined, including standardized patient cases, virtual simulation, or high and low fidelity machines. Recognizing that clinical exposure can never be wholly replaced by simulation, this teaching tool may have validity in specific situations and especially in light of efforts to increase training efficiency. In particular, simulation may enhance the acquisition of foundational knowledge and/or where purposeful, directed teaching of rare clinical cases is necessary for acquisition of competency.

2.4 Redesigned residency education should incorporate self-assessment, fatigue management, and handover skills as key curricular components.

The curricula components of residency education can provide an ideal opportunity to encourage education in vital areas such as self-assessment of performance, the management and mitigation of fatigue, and handover skills, all of which are identified as important components of a targeted, nuanced approach to addressing resident duty hours and associated issues.

2.5 The Royal College, the College of Family Physicians of Canada, and the Collège des médecins du Québec are asked to review their specialty training requirements to allow appropriate flexibility in the organization of training.

Requirements should not be seen to impede those programs who wish to redesign residency training in line with alternate models of care such as night float and cross coverage as long as competencies are still achieved.

3. Accreditation standards must be adapted to support planned modifications of the content and duration of resident duty, through the enforcement of fatigue risk management activities.

The strength of Canada’s robust accreditation systems for residency education, which are collaborative among the three sister colleges, are recognized as powerful levers that must be engaged to support broader reforms to resident duty hours. As such, specific requirements should be reflected in Canadian accreditation standards for specialty and family medicine residency programs across the country:

3.1 Accreditation standards should specify that residency programs must develop, and keep up to date, fatigue risk management plans (FRMPs).

Standards should specify that these plans should be developed and updated by individual residency programs, who would be expected to engage training sites and the hospitals in which residency training takes place for input on the FRMPs.

3.2 The requirement to teach effective self-awareness skills as well as effective handover and communication skills should be integrated into accreditation standards.

Accreditation standards should be modified to reflect a widespread recognition that skills in self-awareness, effective handovers of patient care, and communication are important aspects of safe patient care in any circumstance, but are especially crucial and interrelated with issues regarding resident duty hours.

4. An inventory of alternate models of scheduling and provision of after-hours care should be created and disseminated to provide alternatives and benchmarks of scheduling and service delivery.

Recognizing the 24/7 care provision mandate of health care systems within which residents train, and that resident duty hour regulations will require changes in care delivery systems, an inventory of models of scheduling and provision of after-hours care should be
created and disseminated. Such an inventory should include assessments of the direct and indirect resource requirements of such models. Such a national repository of the following current and innovative approaches would support ongoing scholarship and discussion on this topic throughout Canada through the provision of alternatives and benchmarks of scheduling and service delivery.

Enabling strategies to improve the effectiveness of such an inventory necessitate the following action:

4.1 **A framework for the evaluation of pertinent metrics should be developed and launched to monitor the impact of changes to resident duty hours on the delivery of patient care.**

The importance of ongoing evaluation cannot be underestimated as an essential mechanism to assess current resident schedules and ensure the robustness of any pursued changes to resident duty hours regulations in Canada.

The use of a standard, multi-faceted evaluation framework would aid the compilation and cataloguing of current and emerging models exploring education, patient care and resident wellness, and provide pan-Canadian information on where these programs were utilized and local project contacts.

This framework should be applied and used to document RDH-specific content, in particular innovative models of patient care and educational approaches. A number of metrics have been identified as potential areas of research to be covered by this framework (See Appendix D) by the six Expert Working Groups and the National Steering Committee, and cover such topics as the impact of staffing changes on health care delivery (including clinical coverage), the quality of residency education, and the active participation of residents in clinical care provision and educational activities, and cost-benefit analyses. Recognizing that this will require significant consideration and consultation to be robust, further research should be undertaken to develop a final list of metrics that would be included in this framework.

A standard, national framework for evaluation would allow decision-makers to capture the cost and overall resource implications of alternate models of care delivery and to assess the aggregate impact of resident duty hour reforms on patients, the team of providers, and the institution. Ultimately, the widespread use of such a framework would help ensure the appropriate and effective management of scarce health care resources while maintaining the delivery of high quality patient care. Such an objective is especially vital in an era of rising health care costs and concerns regarding financial sustainability in health service delivery in Canada.

5. **An independent, pan-Canadian consortium devoted to the evaluation of resident duty hours in Canada should be created.**

The creation of a pan-Canadian consortium devoted to the evaluation of resident duty hours would enable local decision-making by providing resources and measurement related to resident duty hours. This group is intended to function as a resource for Provincial Housestaff Organizations and other parties to the collective agreements. This central body would have several key roles. These are outlined below.

- Create and coordinate the dissemination of a national toolbox of resources, including specific schedules and successes, to ensure all have access to resources on best practices.
- Support the process of FRMP creation and implementation in each residency program.
- Undertake scientific and evidence-based research on resident duty hours regulations and impacts on work hours.
- Knowledge translation and dissemination of current, scholarly evidence related to resident duty hours.
References


Appendix A

National Steering Committee on Resident Duty Hours

Co-Chairs

Dr. Jason Frank, Director, Specialty Education, Strategy, and Standards, Royal College of Physicians and Surgeons of Canada

Dr. Kevin Imrie, Vice President of Education, Royal College of Physicians and Surgeons of Canada

Dr. Najma Ahmed, Program Director, General Surgery Residency Training Program, Associate Professor of Surgery, University of Toronto¹

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Dr. Paul Dagg, Clinical Director, Tertiary Mental Health, Interior Health Authority of British Columbia; Clinical Professor, University of British Columbia¹

Dr. Jonathan DellaVedova, Resident nominated by CAIR

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Dr. Susan Edwards, Director, Resident wellness Postgraduate Medical Education Office, Faculty of Medicine, University of Toronto¹

Ms. Danielle Fréchette, Executive Director, Health Policy and Communications, Royal College

Dr. Shiphra Ginsburg, Professor, University of Toronto

Dr. Ken Harris, Executive Director, Office of Education, Royal College

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Dr. Caroline Lacroix, Resident, Representative of the Fédération des Médecins Résidents du Québec (March 2013-June 2013)

Dr. Kathy Lawrence, Program Director Department of Academic Family Medicine, University of Saskatchewan, President Elect and Chair of the Board, College of Family Physicians of Canada

Dr. Francine Lemire, Executive Director and Chief Executive Officer, College of Family Physicians of Canada

Ms. Suzanne McGurn, Assistant Deputy Minister, Health Human Resources Strategy Division, Ontario Ministry of Health and Long-Term Care

Dr. Richard Montoro, Assistant Dean, Resident Professional Affairs, McGill University

Dr. Chris Parshuram, Director of Pediatric Patient Safety Research, University of Toronto²

Dr. Ernest Pregent, Deputy Director, Department of Medical Education, CMQ

Dr. Paul Rainsberry, Associate Executive Director of Academic Family Medicine, CFPC
Dr. Mathieu Rousseau, Resident, Representative of the Fédération des Médecins Résidents du Québec (March 2012-March 2013)

Dr. Charmaine Roye, Director, Professional Affairs and Strategic Health Alliances, Canadian Medical Association

Dr. Maureen Shandling, Vice President, Medical Affairs, Mt. Sinai; Neurologist1

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Dr. Richard J. Warren, Chair, Plastic Surgery Specialty Committee, Royal College of Physicians and Surgeons of Canada

Dr. Grace Yeung, Resident, Representative of the Canadian Association of Internes and Residents (March 2012-April 2013)

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Ms. Julia Selig, Educational Strategy Policy Analyst, Educational Strategy, Innovations, and Development Unit

Ms. Lisa Gorman, Educational Strategy Policy Analyst, Educational Strategy, Innovations, and Development Unit

Ms. Stefanie De Rossi, Research Assistant, Educational Strategy, Innovations, and Development Unit

Mr. Tom McMillan, Senior Communications Specialist, Communications and External Relations

Ms. Gillian Carter, Educational Strategy Policy Analyst, Educational Strategy, Innovations, and Development Unit

Ms. Jessica Anderson, Administrative Assistant, Educational Strategy, Innovations, and Development Unit

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1 Member of National Steering Committee and Expert Working Group Chair/Co-Chair
2 Expert Working Group Chair/Co-Chair
Appendix B

Expert Working Group Membership Lists

The following six Expert Working Groups were convened from October 2012-March 2013 to develop individual reports on topic areas pertinent to resident duty hours. The findings of these reports contributed to the overall evidence base considered by the National Steering Committee through the project. We include them here in order to grant acknowledgement for their input and participation in the project.

**Patient Safety**

Dr. Chris Parshuram (Chair), Director of Pediatric Patient Safety Research, Associate Professor, University of Toronto

Dr. Fred Baxter, Anesthesia Residency Program Director, McMaster University

Prof. Drew Dawson, Director, Appleton Institute, Central Queensland University

Dr. David Dinges, Chief of the Division of Sleep and Chronobiology, Associate Director of the Center for Sleep and Circadian Neurobiology

Dr. Michelle Jung, Resident nominated by CAIR

Dr. Peter Lennox, Plastic Surgeon, British Columbia

Dr. Roderick MacArthur, Program Director, Cardiac Surgery, University of Alberta

Dr. Hugh MacLeod, CEO, Canadian Patient Safety Institute

Dr. Peter Ramon-Moliner, Program Director Anesthesiology, Université de Sherbrooke

Dr. Ganesh Srinivasan, Director, Neonatal-Perinatal Medicine Subspecialty Fellowship Program, University of Manitoba

Dr. Steve Tilley, Resident nominated by CAIR

Dr. Roger Wong, Clinical Professor in the Division of Geriatric Medicine, Department of Medicine, University of British Columbia

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**Professionalism**

Dr. Shiphra Ginsburg (Chair), Professor, University of Toronto

Dr. Adelle Atkinson, Program Director, Postgraduate Medical Education, University of Toronto

Dr. Fiona Bergin, Assistant Professor, Department of Family Medicine, Dalhousie University

Dr. Richard Cruess, Former Dean of the McGill University Faculty of Medicine, Professor of Surgery at McGill’s Centre for Medical Education

Dr. Sylvia Cruess, Endocrinologist, Professor of Medicine, and a Member of the Centre for Medical Education at McGill University

Dr. Douglas Courtemanche, Clinical Professor, Plastic Surgery, University of British Columbia

Dr. Eric Hui, Resident, University of British Columbia

Dr. Tim Karachi, Program Director, McMaster University

Dr. David McKnight, Associate Dean, Equity & Professionalism, University of Toronto

Dr. Alec Yarascavitch, Resident, CAIR Representative

Dr. Doris Yuen, Program Director, Western University

Liaison with Project Secretariat: Julia Selig
National Steering Committee on Resident Duty Hours

Resident and Faculty Health and Wellness

Dr. Jonathan DellaVedova (Co-chair), Resident, CAIR Representative

Dr. Susan Edwards, Director (Co-chair), Resident Wellness PGME Office, Faculty of Medicine, University of Toronto

Dr. Arman Almain, Former Assistant Dean of Resident Affairs, McGill University

Dr. Melissa Andrew, Director of Resident Affairs, Queens University

Dr. Lynn Ashdown, Resident nominated by CAIR

Dr. Najib Ayas, Associate Professor, Department of Medicine, University of British Columbia

Dr. Jordan Cohen, Postgraduate Residency Training Director, Department of Psychiatry Clinical Associate Professor Faculty of Medicine University of Calgary Alberta

Dr. Etienne Désilets, Resident nominated by FMRQ

Dr. Barb Fitzgerald, Clinical Associate Professor, University of British Columbia

Dr. Noura Hassan, R-1 ObGyn Resident, McGill University; Past-President, Canadian Federation of Medical Students

Dr. Melanie Lewis, Associate Dean Learner Advocacy and Wellness, University of Alberta

Dr. Jaret Olson, Program Director of Plastic Surgery, University of Alberta

Dr. Maury Pinsk, Associate Professor, Subspecialty Program Director, Pediatric Nephrology, University of Alberta

Dr. Richard Tang-Wai, Assistant Professor, Residency Program Director, University of Alberta

Liaison with Project Secretariat: Julia Selig

Medical Education

Dr. Paul Dagg (Chair), Clinical Director, Tertiary Mental Health Services, Interior Health Authority; Clinical Professor, University of British Columbia

Dr. Farhan Bhanji, Associate Professor of Pediatrics, McGill University; Clinician Educator, Royal College of Physicians and Surgeons of Canada

Dr. Mathieu Dufour, Resident nominated by CAIR

Dr. Teodor Grantcharov, Associate Professor of Surgery, University of Toronto, General Surgeon, St. Michael’s Hospital

Dr. Elysabeth Fonger, Site Director, Family Practice, University of British Columbia

Dr. Ramona Kearney, Associate Dean, Postgraduate Medical Education, University of Alberta

Dr. Moyez Ladhani, Associate Professor, Department of Pediatrics, Program Director, Pediatric Residency Program, McMaster University

Dr. Natalie Logie, Resident nominated by CAIR

Dr. Thomas Maniatis, Program Director, Internal Medicine Residency Training Program, McGill University

Dr. Carol-Anne Moulton, Staff Surgeon, Hepatobiliary Surgical Oncology, University Health Network; Associate Professor, University of Toronto; Scientist, The Wilson Centre

Dr. Rick Moulton, Associate Professor, Neurosurgery, University of Ottawa; Chief and Divisional Head, The Ottawa Hospital

Dr. Daniel Albert Peters, Plastic Surgery, Ottawa

Dr. Tarek Razek, Chief of Trauma, Montreal General Hospital

Dr. Nathalie Saad, Resident nominated by FMRQ

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Dr. Chris Smith, Program Director of the Core Internal Medicine Program, Queen’s University

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Liaison with Project Secretariat: Lisa Gorman
Health Systems Performance and Health Economics

**Dr. Maureen Shandling** (Chair), Vice President, Medical Affairs, Mt. Sinai; Neurologist

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**Dr. Patrick O’Connor**, Vice President, Medicine, Quality, and Safety, Vancouver Coastal Health

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**Dr. Meera Rayar**, Resident nominated by CAIR

**Dr. Anurag Saxena**, Postgraduate Dean, University of Saskatchewan

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Special Considerations for Procedural Disciplines

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**Dr. Jonathan Cools**, Resident, McGill

**Dr. Maryam Elmi**, Resident

**Dr. Paola Fata**, Program Director, General Surgery, McGill

**Dr. Stan Feinburg**, General Surgeon, Associate Program Director General Surgery, University of Toronto

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**Dr. Sean Gorman**, General Surgeon, Kamloops

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**Dr. Ahmed Kayssi**, Resident

**Dr. Abhaya V. Kulkarni**, Program Director, Neurosurgery, University of Toronto

**Dr. Nir Lipsman**, resident, Division of Neurosurgery, University of Toronto

**Dr. Todd Mainprize**, Neurosurgery, Sunnybrook, Assistant Program Director

**Dr. Brian Muir**, Obstetrics and Gynecology, Grand Prairie, Alberta

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Liaison with Project Secretariat: **Lisa Gorman**
Appendix C

Brief Overview of National Survey Methodology

As a key component of this project, a national survey was developed and launched by the National Steering Committee on Resident Duty Hours. The survey’s key objective was to collect data on the perceptions of resident duty hours in Canada.

The final survey consisted of six domains:

- Patterns of working;
- Sleep patterns;
- Policy options;
- Satisfaction with training;
- Resident duty hour changes;
- Demographics.

The survey was sent to four target audiences: Residents, Program Directors, Postgraduate Deans, and Hospital Administrators. Each audience received a tailored version of the survey depending on their role. The survey was distributed to residents by their Provincial Housestaff Organizations (PHOs) and sent electronically to the other three target audiences via FluidSurveys.

The final survey response rates were as follows:

<table>
<thead>
<tr>
<th>SURVEY GROUP</th>
<th>NUMBER OF RESPONSES</th>
<th>RESPONSE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents</td>
<td>3610/12672</td>
<td>28.5%</td>
</tr>
<tr>
<td>Program Directors</td>
<td>317/766</td>
<td>41.4%</td>
</tr>
<tr>
<td>Postgraduate Deans</td>
<td>13/17</td>
<td>76.5%</td>
</tr>
<tr>
<td>Hospital Administrators</td>
<td>55/116</td>
<td>47.4%</td>
</tr>
</tbody>
</table>

Preliminary results from this survey are integrated into the text of this final report. However, any assessment of the data collected as part of this national survey must be undertaken in recognition of several limitations:

- **A moderate response rate**

Although efforts were made to maximize the survey response rate, it must be acknowledged that, for residents in particular, the rate remained at approximately 30%.

- **Bias**

As with any survey reliant on self-report data, the survey results are limited by the potential for a number of types of bias, including recall bias due to the timeframes utilized in the survey (typically four-week blocks) and response bias given the sensitive nature of many of the questions. For Hospital Administrators, too, a sample of respondents was utilized and, as such, sampling bias may impact upon the results of the study.
Appendix D
Specific Suggested Metrics by Theme Area

Recognizing the importance of accountability and transparency, the National Steering Committee on Resident Duty Hours posits a selection of suggested metrics that could be considered for monitoring of issues and outcomes of interest.

These metrics were collated from the suggestions raised by the six individual Expert Working Groups throughout the project and, as such, reflect key outcomes of interest according to the themes of: patient safety, medical education, health systems performance and health economics, resident and faculty health and wellness, professionalism, and special considerations for procedural disciplines.

These metrics are provided for consideration only and are recognized to require refinement. Given the opportunity for further research and consultation, additional attention could be devoted to assessment of these suggestions in anticipation of the creation of a national evaluation framework.

<table>
<thead>
<tr>
<th>METRICS RELATED TO PATIENT SAFETY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Locally used measures of patient safety (i.e. infection rates, Standardized Mortality) should be integrated into the holistic monitoring and management plan at each hospital.</strong></td>
</tr>
<tr>
<td><strong>Patient Safety</strong></td>
</tr>
<tr>
<td>• Infection rates</td>
</tr>
<tr>
<td>• Standardized mortality rates (HSMR) and morbidity</td>
</tr>
<tr>
<td>• Critical event occurrence</td>
</tr>
<tr>
<td>• Adverse events incidence and near-miss adverse events</td>
</tr>
<tr>
<td>• Use of validated trigger tools</td>
</tr>
<tr>
<td>• Night transfers to critical care units</td>
</tr>
<tr>
<td>• In-hospital cardiac arrest rates</td>
</tr>
<tr>
<td>• Unplanned admission to Intensive Care Unit</td>
</tr>
<tr>
<td>• Hospital readmission rates</td>
</tr>
<tr>
<td>• Errors in medical reconciliation, dose, or timely delivery of medication</td>
</tr>
<tr>
<td><strong>Patient safety in surgical care</strong></td>
</tr>
<tr>
<td>• Unplanned operations following elective surgery</td>
</tr>
<tr>
<td>• Medical complications following elective surgery</td>
</tr>
</tbody>
</table>

...
### METRICS RELATED TO PROFESSIONALISM

There is uncertainty regarding definitions and evaluation strategies for professionalism. Research in this area may utilize other tools, i.e. those typically used for graduating medical students.

<table>
<thead>
<tr>
<th>Physical health</th>
<th>Mental health and wellbeing</th>
<th>Academic and professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reports of maltreatment of students by resident staff members</td>
<td>• Maslach inventory related to burnout, depression, isolation, and stress</td>
<td>• Faculty academic productivity</td>
</tr>
<tr>
<td>• Number of residents in remediation for professionalism</td>
<td></td>
<td>• Faculty attrition rates (e.g. departures to non-academic medical positions, different areas of medicine, or alternate careers)</td>
</tr>
<tr>
<td>• Number of reports of unprofessional incidents reported and details of those reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Incomplete medical records, discharge summaries or dictations and clinic notes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Attendance at teaching rounds and conferences</td>
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### METRICS RELATED TO RESIDENT AND FACULTY HEALTH AND WELLNESS

Reporting should be for defined time intervals and subject to periodic centralized review.

Assessment of health and wellbeing impacts requires a higher standard of rigour than currently utilized.

Fatigue needs to be measured objectively rather than using self-report data. Specific validated instruments are suggested and are noted as appropriate.

<table>
<thead>
<tr>
<th>Physical health</th>
<th>Mental health and wellbeing</th>
<th>Academic and professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Injuries at work (bodily fluid exposures, other)</td>
<td>• Maslach inventory related to burnout, depression, isolation, and stress</td>
<td>• Faculty academic productivity</td>
</tr>
<tr>
<td>• Injuries in transit to and from work (motor vehicle accidents and/or near miss accidents)</td>
<td></td>
<td>• Faculty attrition rates (e.g. departures to non-academic medical positions, different areas of medicine, or alternate careers)</td>
</tr>
<tr>
<td>• Significant weight gain/loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Elevated blood pressure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Injuries at work (bodily fluid exposures, other)   | • Maslach inventory related to burnout, depression, isolation, and stress | • Faculty academic productivity                     |
| Injuries in transit to and from work (motor vehicle accidents and/or near miss accidents) |                                                      | • Faculty attrition rates (e.g. departures to non-academic medical positions, different areas of medicine, or alternate careers) |
| Significant weight gain/loss                       |                                                      |                                                     |
| Elevated blood pressure                            |                                                      |                                                     |
### METRICS RELATED TO MEDICAL EDUCATION

**Distribution, quality**

Emphasis is needed on less routine and index cases, as defined by each specialty.

<table>
<thead>
<tr>
<th>Resident satisfaction and motivation to learn</th>
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<tbody>
<tr>
<td>• Resident satisfaction with educational programs</td>
</tr>
<tr>
<td>• Self-report data on resident motivation to learn</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation and clinical experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Case participation and case log data</td>
</tr>
<tr>
<td>• Attendance at structured educational activities (i.e. academic half-days, academic rounds, journal club) and time to prepare for rounds</td>
</tr>
<tr>
<td>• Active participation (i.e. alertness) during educational activities</td>
</tr>
<tr>
<td>• Prevalence of errors in resident-created orders as detected by other staff members (nursing, pharmacy, etc.)</td>
</tr>
<tr>
<td>• Ability to link learned clinical material to clinical cases</td>
</tr>
<tr>
<td>• Alignment between practice and clinical guidelines, and capacity to provide a rationale when going beyond guidelines</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation of competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Number and proportion of residents in remediation or requiring additional years of training for lack of promotion</td>
</tr>
<tr>
<td>• Changes to examination scores pre- and post-implementation</td>
</tr>
<tr>
<td>• Faculty survey of resident professional traits and competence in clinical care</td>
</tr>
<tr>
<td>• Satisfaction of recent graduates with preparation for practice</td>
</tr>
<tr>
<td>• Promotion of residents from each PGY level</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Preparation for practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Resident perceptions of preparedness for practice in all settings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metrics specific to surgical education</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Role of senior residents as teaching assistants in operative cases</td>
</tr>
</tbody>
</table>
### HEALTH SYSTEMS PERFORMANCE AND HEALTH ECONOMICS

Monitoring and measurement of outcomes should occur in areas of clinical care, systems of care provision, and financial areas.

Dedicated resources for evaluation of these measures are essential.

| Measures of flow and access to health care | Critical transfer availability  
|                                           | Wait times  
|                                           | Readmission rates  
|                                           | Length of stay  

| Quality of care | Patient satisfaction with care, and with care providers  

| Handovers and scheduling | Numbers of handovers based on type of scheduling  
|                          | Time spent in handover per scheduling paradigm  

| Effect of changing hiring practices on medical education | Catalogue of the number (i.e. Full Time Equivalent) and types of alternative practitioners hired  
|                                                         | Evaluations of cost effectiveness and resource implications  

### ADHERENCE TO PLANNED DUTY HOUR OR FATIGUE RISK MANAGEMENT PROGRAMS

Intermittent rotation workload assessments should be undertaken to determine adherence to planned duty hour or fatigue risk management programs.

| Sleep patterns | Quantity of on-shift sleep  
|                | Frequency of sleep interruptions  
|                | Resident sleep patterns before shifts, using measures of risk (e.g. less than 5 hours of sleep in prior 24 hours, less than 12 hour sleep in prior 48 hours, been awake for longer than amount of sleep in prior 48 hours before starting work)  
|                | Mean number of hours slept per week while on in-house and out-of-house call  
|                | Mean number of hours slept per week  

| Monitoring of clinical work outside a residency program with an educational or limited license |  