

MEDICAL COUNCIL OF CANADA

Report of the Incidence and Prevalence of Diseases and Other Health Related Issues in Canada

A Study for the MCC Blueprint Project

Claire Touchie, Chief Medical Education Advisor

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Incidence and Prevalence of Diseases and Other Health Related Issues in Canada: Secondary Study for MCC Blueprint Project

Index

<i>Overview and Purpose of the Study</i>	2
<i>A Snapshot of Health Care – A Top 10 List</i>	3
<i>Core Competencies in the Care of Older Persons</i>	4
<i>Chronic Health Conditions</i>	5
<i>Health Indicators</i>	6
<i>First Nations, Inuit, Métis Health</i>	6
<i>Health of the Population</i>	7
<i>Patient Safety</i>	8
<i>Appendix 1</i>	9
<i>Appendix 2</i>	15

Contributors

Elaine Rodeck PhD – Blueprint Strategist (November 2011-February 2013)

Nathalie Boulet – Student Internship, MCC (Summer 2012)

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Incidence and Prevalence of Diseases and Other Health Related Issues in Canada: Secondary Study for MCC Blueprint Project

Overview and Purpose of the Study

Presently, two examinations, the Medical Council of Canada (MCC) Qualifying Examination (MCCQE) Part I and Part II must be passed as part of the process leading to licensure of physicians in Canada. The target MCCQE Part I and Part II candidate is a resident who is Canadian-trained, has completed his/her M.D. degree, is either entering supervised training (residency) or unsupervised practice and is expected to provide safe and effective patient care for the Canadian public.

The primary purpose of this study is to review and summarize the frequency of most responsible diagnoses as seen in the Canadian context by using existing data. This includes data from inpatient admissions, emergency department visits and outpatient care visits. The data presented is organized by age groups and by certain conditions, such as women's health, psychiatric conditions and chronic medical conditions. The inclusion of these prevalent conditions in medical licensing examinations would help ensure that doctors are adequately prepared to treat today's Canadian population's major health concerns.

As a secondary purpose, this report includes a review of certain areas of importance for the practice of medicine which may not be well represented by patient presentations/diagnoses or the MCC competencies, such as population health, care of the elderly, patient safety issues and aboriginal issues.

A Snapshot of Health Care – A Top 10 List

As of January 2013, the population of Canada has over 35 million individuals, all of whom require health care services in some capacity. In 2012, children and youth under 19 years of age represent 22.4% of the Canadian population; adults 20 to 64 years of age represent 62.6%; whereas seniors over the age of 65 comprise 15% of the population¹. In the 2007 Canadian Survey of Experiences with Primary Health Care², of those individuals having seen a physician in the last year, 35% reported needing routine/ongoing care; 29% reported requiring immediate care for a minor health problem; 24% reported visiting an emergency department at least once; and 10% reported staying at least one night in a hospital, nursing home or convalescent home.

In 2011, the Canadian Institute for Health Information (CIHI) published a "Top 10 Report" detailing health care use and resource demands across Canada, including data from Québec³. The report outlines the most prevalent inpatient and emergency department presentations by age and prevalence of chronic conditions. Findings from this report will

¹ Statistics Canada (2011). The Canadian Population in 2011: Population Counts and Growth.

<http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-310-x/98-310-x2011001-eng.cfm>

² Health Council of Canada (2008). Canadian Survey of Experiences with Primary Health Care in 2007.

³ Canadian Institute for Health Information, *A Snapshot of Health Care in Canada as Demonstrated by Top 10 Lists, 2011* (Ottawa, Ont.: CIHI, 2012). https://secure.cihi.ca/free_products/Top10ReportEN-Web.pdf

contribute to our knowledge of incidence and prevalence of disease in Canada. It also contributes to the drafting of a framework that outlines what should be included and assessed in medical licensing examinations. Canadian medical examinations should focus on cases which will be seen frequently by future doctors. For example, in today's population, chronic obstructive pulmonary disease (COPD) is the most responsible cause of inpatient hospitalization by case volume (excluding maternal and newborn cases), whereas children under the age of 18 present most frequently to the emergency department with an upper respiratory tract infection. It is important to realize that the most prevalent inpatient diagnosis differs for each of these age groups. However, the high prevalence of COPD, urinary tract infection, and anxiety by case volume in different settings and different age groups, suggests that these diagnoses should be more heavily weighted and frequently assessed in medical examinations (see tables 1-7 in Appendix 1).

Therapeutic procedures are most often performed in hospitals either as same day surgery or requiring hospitalization. Frequently reported procedures in adults include ventilation, hip replacement and total hysterectomy. In children, procedures include phototherapy for jaundice, circumcision and appendix removal (see table 10 in Appendix 1). In the 19 to 44 age group, eight of the ten most frequently performed procedures are related to childbirth and include vaginal delivery, obstetrics lacerations repair, induction of labor, augmentation of labor, cesarean section delivery, vacuum traction delivery, fetal heart monitoring and interventions to the uterus following delivery.

Visiting the emergency department is something most Canadians have done, or will do, in their lifetime. The main problem encountered in emergency department visits in Canada is abdominal/pelvic pain. For the age group of 0-18, the main reason for emergency department visits are upper respiratory infections - whereas adults who are older than 45 years of age (including the 65+) most commonly visit the emergency department for chest/throat pain. Anxiety disorders are the most common mental health disorders seen in emergency department visits, by case volume. Finally, wrist/hand areas are the most common fracture sites resulting in emergency department visits, by case volume.

Most care of patients in Canada takes place in outpatient settings such as in clinics (the main problems for outpatient clinic visits are illustrated in tables 1-7 in Appendix 1.) Hypertension, diabetes and anxiety are the three most frequently encountered diagnoses in the general population reported in Nova Scotia (personal communication, 2012). Routine infant/child health checks, upper respiratory infection and otitis media are the most common for ages 0 to 18 - whereas anxiety, supervision of normal pregnancy and depressive disorders are more common in the 19 to 45 age group.

Other areas with frequency data reported in Appendix 1 that help illustrate health care conditions encountered by Canadians include: women related issues, mental health disorders, chronic conditions and medication use in the elderly (tables 6-9 in Appendix 1).

Core Competencies in the Care of Older Persons

According to the 2011 Canadian Census, the senior population (65+) is predicted to outnumber youth (age 14 and younger) by 2015⁴. In fact, centenarians (100+) are the second most rapidly growing age group. This increasing senior population will place more demands on the health care systems and require more attention to problems specific to aging individuals. By meeting the core competencies created by the Medical Education Committee of Canadian Geriatrics Society (CGS), undergraduate students will be better equipped to provide care to older patients.⁵ When a graduating medical student is presented with an elderly patient, the student will be expected to: (1) provide health care for cognitive impairments; (2) facilitate a functional assessment; (3) deal with falls, balance and gait disorders, and ; (4) be able to manage their medication. They will also be expected to: (1) have a clear understanding of the biology of aging and atypical presentation of disease; (2) be able to handle adverse events; (3) manage urinary incontinence; (4) handle transitions of care, and; (5) define and describe care plans⁶. By incorporating these competencies, as well as the incidence and prevalence data for this population into medical licensing examinations, graduates should possess the necessary knowledge and skills required to treat this growing population.

Chronic Health Conditions in Canada

Chronic health conditions are a significant concern for many Canadian citizens, including the elderly population. The number of people managing a chronic health condition is expected to increase in the coming years⁷. A report by the Health Council of Canada discusses the impact of the growth in chronic health conditions on our population and the subsequent outcome of our use of health care services due to this increase⁸. This report focuses on the population managing one or more of the highly prevalent chronic health conditions including: arthritis, cancer, chronic obstructive pulmonary disease, diabetes, heart disease, high blood pressure, and mood disorders. In fact, about nine million Canadians are afflicted by at least one of these seven chronic health conditions. Furthermore, this prevalence is increasing with an aging population. Currently, over 75% of adults 65 and older contend with one or more chronic health conditions. Out of these seven chronic health conditions, arthritis and high blood pressure are the most common among Canadians overall, with 16% of the population managing arthritis and 15% of the population suffering from high blood pressure. Considering that arthritis and high blood pressure commonly occur concomitantly, it is also important to consider this co-occurrence when assessing medical students' core competencies.

⁴ Canadian Institute for Health Information, *Health Care in Canada, 2011: A Focus on Seniors and Aging* (Ottawa, Ont.: CIHI, 2011).

⁵ Parmar, J. (2009). Core competencies in the care of older persons for Canadian medical students. *Canadian Journal of Geriatrics*, 12 (2), 70-73.

⁶ Parmar, J. (2009). Core competencies in the care of older persons for Canadian medical students. *Canadian Journal of Geriatrics*, 12 (2), 70-73.

⁷ Health Council of Canada. (2007). Population Patterns of Chronic Health Conditions in Canada: A Data Supplement to *Why Health Care Renewal Matters: Learning from Canadians with Chronic Health Conditions*. Toronto: Health Council

⁸ Health Council of Canada. (2007). Population Patterns of Chronic Health Conditions in Canada: A Data Supplement to *Why Health Care Renewal Matters: Learning from Canadians with Chronic Health Conditions*. Toronto: Health Council.

Not surprisingly, one-third of Canadians who have at least one chronic health condition avail themselves of health care services more regularly than those who do not suffer from chronic health conditions. The population with one or more chronic health condition uses around 51% of general practitioner consultations, 67% of nursing consultations, and a full 72% of nights spent in a hospital. It is also necessary to further qualify these results as a function of the specific chronic health condition. For example, people with mood disorders or cancer spend more nights in hospital than those with high blood pressure, diabetes, arthritis or heart disease.

Chronic conditions, and the specific population affected by these conditions, are very important to consider when determining the content and domains of medical licensing examinations. As the Canadian population ages, an increase in chronic illnesses will be seen and managed by health care professionals. The Health Council of Canada states that by 2036, our senior population is expected to account for 25% of the entire Canadian population (10.4 million)⁹. Therefore, it is important to ensure that medical licensing examinations adequately assess students in regard to their knowledge of these chronic conditions, the co-occurrence of chronic health conditions, as well as their impact on health care use. All of these will become increasingly more commonplace in the years to come.

Health Indicators

About one-third of Canadians over the age of 12 currently manage one or several chronic health conditions. This number is likely to continue to rise in the coming years. Many of these chronic illnesses can potentially be managed and monitored outside of the hospital environment. These conditions are often defined as ambulatory care sensitive conditions (ACSC), meaning, when appropriate, ambulatory care may prevent or diminish the need for hospitalization¹⁰. There is evidence to suggest that factors such as access to services and quality of care may be related to the ACSC hospitalization rates. According to the Health Indicators (2008) report, more accessible and well-functioning primary health care services are required to diminish these ACSC hospitalization rates. In order to provide excellent primary care, physicians need to be able to manage chronic illnesses by preventing, detecting, monitoring and following up with patients who have chronic conditions. The appropriate management of chronic diseases may play a crucial role in cutting down admissions to hospitals. As such, the latter is a critical component of medical care and should be properly assessed in medical licensing examinations.

Several factors affect ACSC hospitalizations, including variations by age. Patients aged 19 years and younger accounted for about 65% of asthma admissions, whereas patients aged 60-74 years accounted for about 73% of COPD and heart failure admissions. These older patients were also hospitalized more frequently for angina and hypertension. Chronic illness prevalence between sexes is also a factor affecting ACSC hospitalization rates. With adequate ambulatory care, patients with ACSCs may be able to avoid hospitalization. It is important to keep in mind

⁹ Canadian Institute for Health Information, *Health Care in Canada, 2011: A Focus on Seniors and Aging* (Ottawa, Ont.: CIHI, 2011).

¹⁰ Canadian Institute for Health Information, *Health Indicators 2008* (Ottawa: CIHI, 2008).

that these conditions vary across age, sex and region and that high hospitalization rates may be an indicator of issues in health care accessibility and/or primary health care services. Additionally, it is necessary to examine the prevalence of these diseases in order to see how the latter might impact ACSC hospitalization rates. Taking into consideration these factors and their effects on ACSC hospitalization rates, it is critical to ensure that physicians possess the knowledge, skills and attitudes (KSAs) necessary to provide quality primary care. Incorporating items and cases that target chronic disease management in medical licensing exams may contribute to ensuring that medical graduates possess the KSAs to improve the quality of primary health care in managing chronic disease and reduce ACSC hospitalization rates.

First Nations, Inuit, Métis Health

An important area to consider when discussing the issue of Canadian medical licensing examination content is First Nations, Inuit and Métis health care. It is important to recognize Aboriginal health issues and that these communities are diverse in their health needs and practices¹¹. Numerous health disparities exist between First Nations, Inuit and Métis peoples and the general Canadian population. For example, the life expectancy of First Nations people is lower than the general population, infectious diseases are more commonly seen in these communities compared to the overall population, and injury and poisoning are the most common causes of death (for patients between the ages of 1-44). This may be due to social determinants of health including poverty, issues such as intergenerational effects of colonization and residential schools, and the increase prevalence of diseases linked to smoking, alcohol consumption and obesity¹². It is thus important to understand that for this specific population, health disparities may be due to multiple factors including cultural differences. Medical licensing exams in Canada could consequently include certain items and cases that focus on the health care needs of these populations.

Health of the Population

Public health refers to a population-based approach to health. The core functions of public health are: (1) health surveillance; (2) health promotion; (3) disease and; (4) injury prevention, health protection, population health assessment and emergency preparedness¹³. However, few Canadian medical graduates possess a strong knowledge base in the domain of public health. In addition, medical students who recently participated in focus groups on public health education found public health lectures to be boring, and had limited opportunities to be exposed to public health in the field. In summary, Canadian medical graduates perceived public health to be difficult to grasp as medicine because public health is in sharp contrast to traditional medical care where the emphasis is on the health of an individual, rather than the health of a population.

¹¹ Indigenous Physicians Association of Canada and The Association of Faculties of Medicine of Canada (2009). First Nations, Inuit, Métis Health Core Competencies: A Curriculum Framework for Undergraduate Medical Education.

¹² Health Council of Canada (2012). Empathy, dignity and respect. Creating cultural safety for Aboriginal people in urban health care.

¹³ Public Health Task Group Association of Faculties of Medicine of Canada. (2006). Enhancing the Health of the Population: The Role of Canadian Faculties of Medicine.

This suggests a need for increased and more relevant education in public health in Canada. Currently, public health is taught predominantly as a part of a basic/social sciences combination early in the curriculum, rather than as a clinical topic. Lectures are often delivered in traditional lecture format rather than through interactive learning, contributing to the students' view that these "are irrelevant". Also, since many medical students do not view public health as "real medicine", basic education in public health is not valued. The low overall performance on the Population Health, Ethical, Legal and Organizational (PHELO) component of the MCCQE Part I reflects this lack of interest and knowledge in public health.

Nevertheless, there are many steps being taken to enhance public health practice in Canada. The future vision is that "all physicians graduating from Canadian medical schools should be able to practice medicine with the concepts of public health as key elements in their day-to-day activities, as well as seeing themselves as a key component of the public health system" (reference 13, p.1)¹³. By defining core competencies for public health practitioners as well as designing new and enhanced curricula for all health professionals, medical students should graduate with the knowledge and skills needed to: prevent chronic diseases, prevent injuries, and respond to public health emergencies and infectious disease outbreaks. A greater emphasis on public health concepts needs to be incorporated in the undergraduate curriculum. Finally, medical licensing examinations can play an important role by continuing to emphasize PHELO as an important domain to assess.

Patient Safety

In order to provide safe care to patients, it is important for medical doctors to have a clear understanding of safety issues and patient safety concepts. The Canadian Patient Safety Institute (CPSI) has developed a safety competencies framework to help health professionals to improve the health of their patients¹⁴. Six overarching competencies have been developed to enhance safe practices: (1) contribute to a culture of patient safety, (2) work in teams for patient safety, (3) communicate effectively for patient safety, (4) manage safety risks, (5) optimize human and environmental factors, and (6) recognize, respond to and disclose adverse events. The competencies describe the KSAs necessary for the safe care of patients.

Recently, the American College of Physicians has published patient safety strategies which the authors strongly recommend be adopted¹⁵. Although these strategies are proposed for an American patient population, they are in keeping with prior research from the CPSI. These strategies are listed in Appendix 2.

By including patient safety issues in examinations, the MCC acknowledges the need for ongoing physician improvement, as well as familiarity with published strategies in order to further improve the health of their patients.

¹⁴ Frank JR, Brien S, (Editors) on behalf of The Safety Competencies Steering Committee. The Safety Competencies: Enhancing Patient Safety Across the health professions. Ottawa, ON: Canadian Patient Safety Institute; 2008

¹⁵ Shekelle PG et al. The Top Patient Safety Strategies that can be Encouraged for Adoption Now. Ann Intern Med. 2013; 158: 365-368

Summary

The intent of the MCCQE is to assess the knowledge, skills, and attitudes required by medical doctors to ensure patient safety and positive health outcomes. While a national survey will be the source of data for developing new MCCQE test specifications focusing on the importance of physician competencies, this study will also contribute to the process by providing a review of existing data that outlines the frequency of clinical presentations for inpatient admissions, outpatient and emergency department visits in the Canadian population. It also provides information about other health related issues that are necessary for the improvement of Canadians' health.

Appendix 1 – Prevalence of Disease by Frequency of Diagnoses

Table 1: Main Diagnosis by Services Rendered (Excl. Maternal and Newborn Cases) General Population

	Inpatient Hospitalization	Emergency Department Visit	Outpatient care/Clinics: General Practice	Outpatient care/Clinics: All Specialties
1	COPD	Abdominal complaints	Essential HTN	Essential HTN
2	Acute coronary syndrome	Chest/ Throat Pain	Diabetes mellitus Type II	Diabetes mellitus Type II
3	Pneumonia	Other Medical Care*	Anxiety	Anxiety
4	Heart Failure	Upper Respiratory Infection	Backache	Backache
5	Other Medical Care*	Urinary Tract Infection	Depressive Disorder	Abdominal Pain
6	Arthrosis of Knee	Back Pain	Upper Respiratory Infection	Depressive Disorder
7	Convalescence	Open Wound, Wrist/Hand	Abdominal Pain	Upper Respiratory Infection
8	Fracture of Femur	Open Wound, Head	Urinary Tract Infection	Urinary Tract Infection
9	Appendicitis	Diarrhea and Gastroenteritis	COPD	Pain in limb
10	Chronic Ischemic Heart Disease	Sore Throat	Pain in limb	COPD

*Other medical care: palliative care, chemotherapy and desensitization to allergens (CIHI, 2010)

Table 2: Main Diagnosis/ Problem by Services Rendered for Ages 0 to 18

	Inpatient Hospitalization	Emergency Department Visit	Outpatient care/Clinics
1	Newborn related issues	Upper Respiratory Infection	Routine Infant/ Child Health Check
2	Disorder Related to Short Gestation/ Low Weight	Ear Infection	Upper Respiratory Infection
3	Neonatal Jaundice	Open Wound, Head	Otitis Media
4	Respiratory Distress of Newborn	Abdominal/ Pelvic Pain	Post Birth visit
5	Pneumonia	Sore Throat	Acute Pharyngitis
6	Bronchiolitis	Diarrhea and Gastroenteritis	Cough
7	Disorder Related to Long Gestation/ High Weight	Viral Infection	Rash/ Skin Eruption
8	Appendicitis	Fever	Asthma
9	Asthma	Other Head Injury	Abdominal Pain
10	Perinatal Condition	Asthma	Contact Dermatitis/Eczema

Table 3: Main Diagnosis/ Problem by Services Rendered for Ages 19 to 44

	Inpatient Hospitalization (Excluding Maternal Cases)	Emergency Department	Outpatient care/Clinics
1	Appendicitis	Abdominal/ Pelvic Pain	Anxiety
2	Gallstones	Chest/ Throat Pain	Supervision of Normal Pregnancy
3	Fracture of Lower Leg, Including Ankle	Open Wound, Wrist/ Hand	Depressive Disorder
4	Abdominal/ Pelvic Pain	Back Pain	Backache
5	Schizophrenia	Other Medical Care	Contraception Counsel/ Advice
6	Excessive and Irregular Menstruation	Urinary Tract Infection	Abdominal Pain
7	Convalescence	Sore Throat	Upper Respiratory Infection
8	Mental/ Behavioural Disorder Due to Alcohol	Upper Respiratory Infection	Urinary Tract Infection
9	Complications of Procedures	Diarrhea and Gastroenteritis	Essential Hypertension
10	Pancreatitis	Sprain/ Strain of Ankle/ Foot	Acute Pharyngitis

Table 4: Main Diagnosis/ Problem by Services Rendered for Ages 45 to 64

	Inpatient Hospitalization	Emergency Department	Outpatient care/Clinics
1	Acute Coronary Syndrome	Chest/ Throat Pain	Essential Hypertension
2	Arthrosis of Knee	Other Medical Care	Diabetes Mellitus Type II
3	COPD	Abdominal/ Pelvic Pain	Anxiety
4	Other Medical Care	Back Pain	Backache
5	Chronic Ischemic Heart Disease	Cellulitis	Depressive Disorder
6	Chest/ Throat Pain	Open Wound, Wrist/ Hand	Abdominal Pain
7	Gallstones	Urinary Tract Infection	Hypothyroidism
8	Convalescence	Other Surgical Follow-up Care	Hypercholesterolemia
9	Arthrosis of Hip	Other Soft Tissue Disorders	Pain in Limb
10	Pneumonia	Upper Respiratory Infection	Urinary Tract Infection

Table 5: Main Diagnosis/ Problem by Services Rendered for Ages 65+

	Inpatient Hospitalization	Emergency Department	Outpatient care/Clinics
1	COPD	Chest/ Throat Pain	Essential Hypertension
2	Heart Failure	Other Medical Care	Diabetes Mellitus Type II
3	Heart Attack	Urinary Tract Infection	COPD
4	Pneumonia	Abdominal/ Pelvic Pain	Dementia
5	Fracture of Femur	COPD	Pneumonia
6	Arthrosis of Knee	Pneumonia	Urinary Tract Infection
7	Other Medical Care	Cellulitis	Backache
8	Atrial Fibrillation and Flutter	Heart Failure	Anxiety
9	Urinary Tract Infection	Back Pain	Osteoarthritis
10	Chronic Ischemic Heart Disease	Dizziness/ Giddiness	Abdominal Pain

Table 6: Mental Health Disorders

	Mental Health Disorders
1	Anxiety Disorders
2	Mental/ Behavioural Disorder Due to Alcohol
3	Depressive Episode
4	Severe Stress and Adjustment Disorder
5	Schizophrenia
6	Mental/ Behavioural Disorder to Drug/ Substance Use
7	Bipolar Affective Disorder
8	Nonorganic Psychosis
9	Mental/ Behavioural Disorder Due to Opioids
10	Dementia

Table 7: Women’s Health from ambulatory (Outpatient care/Clinics) data (one province)

	OB/GYN	Gen Practice	OB/GYN	OB/GYN
	18-44	18-44	45-64	65+
1	Supervision of normal pregnancy	Supervision of normal pregnancy	Menopause/ Postmenopausal symptoms	Cervical/Uterine malignancy
2	Complication of pregnancy	Anxiety	Postmenopausal bleeding	Menopause/ Postmenopausal symptoms
3	Advanced maternal age	Contraception counseling	Cervical/Uterine malignancy	Prolapse vaginal wall (not uterine)
4	Previous cesarean delivery	Depressive disorder	Abnormal bleeding/menstruations	Postmenopausal bleeding
5	Contraception counseling	Urinary tract infection	Excessive/frequent menstruation	Unspecified genital prolapse
6	Abnormal bleeding/menstruations	Abdominal pain	Abnormal Pap smear	Urinary incontinence
7	Abnormal Pap smear	Backache	Dysplasia of cervix	Uterovaginal prolapse
8	Postpartum care immediately post-delivery	Upper respiratory infection	Leiomyoma of uterus	Urinary complications
9	Poor obstetrical history	Essential hypertension	Prolapse vaginal wall (not uterine)	Stress incontinence
10	Dysplasia of cervix	Acute pharyngitis	Stress incontinence	Vaginitis/vulvovaginitis

Table 8: Chronic Conditions

	Chronic Conditions
1	Hypertension
2	Arthritis
3	Chronic Pain
4	Depression
5	Asthma
6	Diabetes Mellitus
7	Heart Disease
8	Cancer
9	Mood Disorder
10	Emphysema, COPD

Table 9: Medication use in Elderly – Drugs by rate of use amongst seniors

	Drug Category
1	HMG COA reductase inhibitors
2	ACE inhibitors
3	Proton pump inhibitors
4	Beta-blocking agents (selective)
5	Dihydropyridine derivatives
6	Angiotensin II Antagonists
7	Thyroid hormones
8	Thiazides
9	Natural opium alkaloids
10	Biguanides

Table 10: Procedures by frequency of case volume

	0-18	19-44*	45-64	65+
1	Skin therapy	Appendix removal	Ventilation	Ventilation
2	Ventilation	Total hysterectomy	Implantation of internal devices (venous access)	Implantation of internal devices (venous access)
3	Circumcision	Occlusion, Fallopian tube	Coronary angioplasty	Knee replacement
4	Appendix removal	Ventilation	Total hysterectomy	Hip replacement
5	Implantation of internal devices (venous access)	Implantation of internal devices (venous access)	Knee replacement	Coronary angioplasty
6	Removal of tonsils	Gallbladder removal	Muscle repair, Chest/Abdomen	Pleural drainage
7	Vaginal delivery	Muscle repair, Chest/Abdomen	Total removal of ovary with Fallopian tube	Installation of external appliance (cardiopulmonary bypass)
8	Obstetric lacerations repair	Total removal of ovary with Fallopian tube	Installation of external appliance (cardiopulmbypass)	Dialysis
9	Augmentation of labour	Ankle joint fixation	Hip replacement	Partial large bowel removal
10	Tongue release	Abdominal cavity release	Abdominal cavity drainage	Implantation of internal device (pacemaker)

*excludes obstetrics cases

Appendix 2

Table 1: Patient Safety Strategies strongly encouraged for immediate adoption *

1	Preoperative checklists and anesthesia checklists to prevent operative and postoperative events
2	Bundles that include checklists to prevent central line-associated bloodstream infections
3	Interventions to reduce urinary catheter use
4	Bundles that include strategies to prevent ventilator-associated pneumonia (e.g.: head-of-bed elevation)
5	Hand hygiene
6	Do-not-use list for hazardous abbreviations
7	Multicomponent interventions to reduce pressure ulcers
8	Barrier precautions to prevent health care-associated infections
9	Use of real-time ultrasonography for central line placement
10	Interventions to improve prophylaxis for venous thromboembolisms

Table 2: Patient Safety Strategies encouraged for immediate adoption*

1	Multicomponent interventions to reduce falls
2	Use of clinical pharmacists to reduce adverse drug events
3	Documentation of patient preferences for life-sustaining treatment
4	Obtaining informed consent to improve patients' understanding of the potential risks of procedures
5	Team training
6	Medication reconciliation
7	Practices to reduce radiation exposure from fluoroscopy and CT
8	Use of surgical outcome measurements and report cards
9	Rapid-response systems
10	Use of complementary methods for detecting adverse events or medical errors to monitor for patient safety problems
11	Computerized provider order entry
12	Use of simulation exercises in patient safety efforts

*reproduced from the article by Shekelle PG et al. The Top Patient Safety Strategies That Can Be Encouraged for Adoption Now. *Ann Intern Med.* 2013;158: 365-368