



Canadian Journal of Health Technologies

February 2024 Volume 4 Issue 2

CADTH Health Technology Review

General Ultrasound Examination Volumes per Sonographer 8-Hour Workday



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Key Messages

- The average number of general ultrasound examinations performed by a sonographer in an 8-hour workday is not well reported in the literature. Through an informal survey, we estimate that the average general ultrasound examination volume across Canada per 8-hour workday is 11.25, with a range of 9 to 14.
- Understanding ultrasound examination data volumes provides information to help understand productivity. Decision-makers can also use the examination volume data and factors affecting sonographer examination throughput to create strategies to enhance efficiency in clinic and hospital departments.
- Factors that may influence the average examination rate include examination time, the age of equipment, resource availability, staffing shortages, and sonographer's work-related musculoskeletal disorders and stress.

Context

Diagnostic ultrasound is an imaging method used to visualize internal organs, systems, and structures within the body to diagnose disease and guide treatment decisions.¹⁻³ Ultrasound examinations are primarily conducted by sonographers⁴ in various settings within hospitals and clinics, which are the focus of this report.¹ In some instances, physicians and nurses also conduct ultrasound examinations,^{1,5} particularly in the emergency department setting, and often using point-of-care ultrasound equipment.⁶

During an examination, sonographers place an ultrasound hand-held transducer on the skin of the patient, although some ultrasound examinations require the placement of the transducer inside the body to take necessary images.¹ An image is created, stored, and processed before a report is generated for physicians, who use the information to guide treatment decisions.⁷ Most sonographers in Canada are scheduled for an 8-hour workday, including breaks amounting to 1 hour per day. In addition to performing ultrasound examinations, sonographers also have administrative duties such as triage, scheduling, and conducting quality control checks on ultrasound equipment.⁷

Objectives

The key objectives are to estimate the average number of general ultrasound examinations performed by a sonographer per 8-hour workday and to identify factors that can influence the number of examinations conducted.

Methods

This document summarizes information from provincial, regional, and hospital-based contacts who were informally asked to provide information on the number of general ultrasound examinations conducted by a sonographer in an 8-hour workday. A brief survey was sent to 17 key decision-makers across all 10 provinces who were requested to answer specific questions but were not required to disclose their province or location. Following this process does not require internal authorization and approval within jurisdictions, which allows for faster responses. Decision-makers within the 3 territories were not approached, based on the rapid timelines for this report.

Contacts were identified through the Canadian Medical Imaging Inventory (CMII) network of senior decision-makers in provinces, health regions, and in some instances hospitals. The responses reflect general hospital practices across either a region or province, and in some instances hospital level practices are reported. Data were collected from contacts in all 10 provinces. In 9 provinces, a single contact provided information provincially, regionally, or for a group of hospitals. In 1 province, 3 hospitals provided information, and the number of ultrasound examinations was averaged between them. In 4 instances, contacts voluntarily provided data on the number of ultrasound examinations conducted by sonographers in the private setting, and these data are reported too. The survey was open from December 8, 2023, to January 8, 2024.

This report also summarizes information identified through a limited literature search on factors that can influence examination volume.

Results

Examination Volumes

According to provincial, regional, and hospital-based contacts, sonographers perform an average of 11.25 general ultrasound examinations in an 8-hour workday, with a range of 9 to 14 ([Figure 1](#)).

In addition, respondents from 4 provinces volunteered information on ultrasounds conducted in private clinics. Overall, private clinics reported between 15 to 20 ultrasound examinations per workday. The higher volume of examinations conducted in the private setting compared to those in a general hospital setting is largely attributed to private clinics operate in the outpatient setting and conduct less time-consuming and complex examinations. As well, unlike in the hospital setting, time slots do not need to be assigned for emergency or inpatient examinations that may or may not be filled.

Factors That Influence Examination Volumes

Many factors were reported by our contacts across Canada that may influence the volume of ultrasound examinations that can be conducted by a sonographer during an 8-hour workday, and these may differ from day to day. Responders reported that scheduled examinations are not always performed due to patient no-shows, and last-minute attempts to fill vacancies may or may not be successful. Other factors that are

reported in the published literature that can potentially impact a sonographer’s examination volume are reported here.

Examination Times

Examination times can vary. Certain people with more complex conditions require longer examination times to gain a clearer image to support diagnosis.⁸ These types of examinations may require the sonographer to try different transducers or exert more physical force to yield a clearer image.^{8,9} As a result, sonographers may spend more time on 1 examination, which affects their overall schedule and capacity to carry out multiple examinations over the period of a workday.

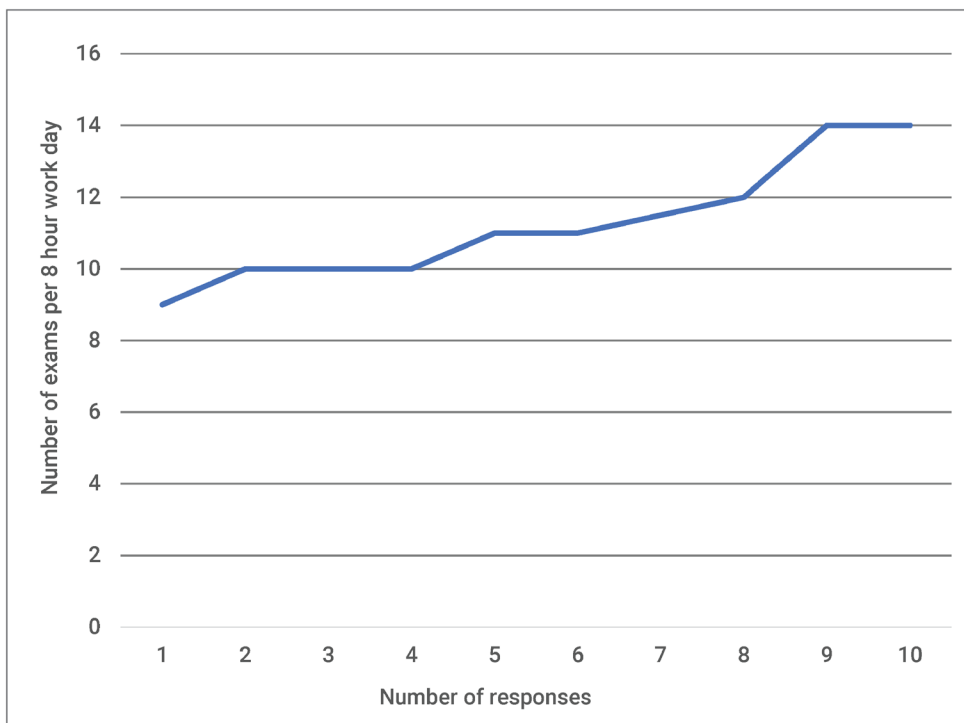
People who require urgent examinations may also take longer to image compared to nonurgent cases because the person requiring the examination may need additional support to position themselves appropriately.¹⁰

Secondary Tasks and Administrative Duties

Along with conducting ultrasound scans, sonographers are also responsible for performing secondary tasks such as:^{7,9}

- consulting with physicians
- preparing examination reports for physicians

Figure 1: Number of General Ultrasound Examinations Performed in an 8-Hour Workday



Note: Response number refers to the number of general ultrasound examinations performed per 8-hour workday provided by provincial, regional, and hospital-based contacts. Each of the 10 responses reflects a provincial average.

- responding to patient queries
- training newer staff members or students
- performing quality control checks.

Performing secondary tasks influences the overall volume of examinations a sonographer can conduct in a day. In some instances, sonographers may also perform administrative tasks, including scheduling and patient triage.⁹

Clinic or Department Capacity

Some clinics may have limited access to ultrasound devices.^{7,9} For departments that have more sonographers available than ultrasound devices, there could be a delay in workflow while sonographers wait for a machine to become available.⁹ Scheduling could mitigate these types of delays but could also restrict the number of patients a sonographer examines.

According to the Canadian Occupational Projection System, a government body that identifies occupations that may face labour shortages or surpluses, a labour shortage in medical sonographers is anticipated between 2022 and 2031.¹¹ With fewer sonographers available at clinics, each sonographer could have a higher workload, thus increasing the risk of injury and work-related stress.^{12,13} Consequently, this could impact individual capacity to carry out multiple scans per day. Furthermore, the increased stress could lead to a high staff turnover rate which can impact productivity.¹²

Work-Related Musculoskeletal Disorders

Sonographers are prone to work-related musculoskeletal disorders with a reported prevalence among the profession of between 63% to 98.7%.¹⁴ The neck, shoulders, lower back, and wrist are the most frequent areas of discomfort and injury.⁷ Injury is often caused by repeated and awkward movements carried out during a scan, particularly when the sonographer is required to hold a tight grip on the hand-held transducer for long periods of time to get a clear image.^{9,14} Sitting still in a single position for lengthy periods can also contribute to work-related musculoskeletal disorders.¹⁴

Injuries can limit a sonographer's capacity and ability to work. Up to 60% of sonographers have been found to continue to work while in pain.^{9,15} Working in pain may result in a decrease in productivity caused by a reduced ability to carry out physical tasks and decreased concentration.¹⁶ Moreover, working with pain can lead to further injury or worsening of symptoms, resulting in work absenteeism.

Prolonged Work-Related Stress

Some sonographers may experience emotional, physical, and mental exhaustion that may be triggered by prolonged and excessive stress.¹⁷ An increased workload and whether or how to deliver of adverse or bad news to patients were identified as the main causes of sonographer stress and exhaustion.¹² Although a radiologist is responsible for reading and interpreting examinations, the sonographer is the one who performs the examination on the individual seeking a diagnosis, so they are often the first person to be asked about the results of an examination.

Work-related stress may reduce job satisfaction and motivation, which could result in absenteeism and high staff turnover.^{12,13} In addition, emotional stress can lead to reduced job performance, which can affect patient outcomes.^{12,13}

Age of Equipment

Newer ultrasound systems, particularly those that can automate annotation and measurements, may decrease examination durations. At the same time, if new ultrasound systems with 3-dimensional or 4-dimensional imaging capabilities require protocol changes, the examination times may be longer.¹⁸ Appropriate training may help sonographers to maximize the efficiencies of newer systems.¹⁸

Limitations

An informal survey was conducted to support this work, so the results may not be an accurate representation of individual sonographer workload per 8-hour shift at the facility- or province-wide level. The reporting of an overall average number of examinations that can be conducted in an 8-hour workday does not consider the full spectrum of factors that can influence examination volumes. The rate of ultrasound examinations varied by site and may be affected by numerous confounding variables.

Conclusion

Sonographers across Canada conduct an average of 11.25 general ultrasound examinations per 8-hour workday, with a range between 9 and 14. Various, often confounding, factors can affect workload, and they are often dependent on the unique circumstances of a facility. These factors include case complexity, department capacity, work-related musculoskeletal disorders, work-related stress, and availability of resources.

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ISSN: 2563-6596

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Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

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