

Appendix A: Introduction to Imaging Modalities for Which Data Were Collected in the 2017 Imaging Inventory

Computed Tomography

Computed tomography (CT) employs X-rays as a source of ionizing radiation, sensitive radiation detectors, and computerized analysis to create cross-sectional images of the body, including the head, heart, lungs, cardiovascular system, musculoskeletal system, abdomen, pelvis, and spine.³⁸ Specialties that routinely employ CT include neurology, cardiology, oncology, internal medicine, orthopedics, and emergency trauma care.

The main advantages of CT are its speed, which enables rapid imaging and diagnosis in urgent situations, and its ability to visualize fine details in bone, lungs, and other organs.³⁸ CT involves exposure to ionizing radiation, which means that the risk–benefit of its use in pregnancy and in young children, and its repeated use, must be assessed.³⁸⁻⁴⁰

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) uses powerful electromagnetic and radiofrequency fields and computation to produce cross-sectional images of the body, including the head, neck, cardiovascular system, breast, abdomen, pelvis, musculoskeletal system, and spine.⁴¹ Specialties that commonly employ MRI include neurology, gastroenterology, cardiology, oncology, internal medicine, orthopedics, and emergency services.⁴¹

MRI does not use ionizing radiation, and therefore may be preferred if CT and MRI would provide comparable information, for example when imaging children.⁴¹ MRI provides high sensitivity and soft tissue details, especially in the abdomen and pelvis, allowing for visualization of anatomy and pathologies. In oncology, this assists in early diagnosis, staging and re-staging, assessment of treatment response, and detection of recurrence in various types of cancer.⁴¹

A disadvantage of MRI is that the exams can take up to an hour or more, and patients must be able to remain motionless within a narrow enclosure. It may not be suitable for patients with claustrophobia, those who cannot lie flat for prolonged periods, or those who are obese.⁴¹⁻⁴³ The magnetic fields and radiofrequencies used in MRI are incompatible with many common implantable medical devices, such as deep brain stimulators, cochlear implants, and pacemakers.^{43,44} All patients undergoing an MRI exam must be screened beforehand to identify any potentially contraindicated devices or metallic foreign bodies.^{43,44}

Nuclear Medicine

Single-Photon Emission Computed Tomography

In nuclear medicine imaging, trace amounts of radiopharmaceuticals are administered to patients intravenously or by injection (e.g., subcutaneously or intradermal), ingestion, or inhalation to visualize areas of radioisotope uptake within the body. Depending on the radiopharmaceutical administered, the function (i.e., physiology) of almost any organ system can be observed.⁴⁵ Nuclear medicine gamma cameras detect the gamma rays emanating from the radioisotope and form flat images; most cameras are also capable of cross-sectional imaging (single-photon emission computed tomography, SPECT).

Nuclear medicine exams identify and evaluate a variety of pathologies, including cancer, heart disease, and gastrointestinal, endocrine, and neurological disorders. Medical specialties that commonly use SPECT imaging include oncology, neurology, cardiology, internal medicine, orthopedics, pediatrics, pneumology, and infectious disease.

Positron Emission Tomography

Positron emission tomography (PET) uses injection of a sugar or other metabolic tracer labelled with a positron-emitting radioisotope, sensitive radiation detector cameras, and powerful computers to detect and visualize areas of increased metabolism, such as tumours. It creates three-dimensional images of regions of interest such as brain, bone, and heart.⁴⁶

The main advantage of PET (or its successor, positron emission tomography–computed tomography, PET-CT) imaging is the ability to precisely quantify metabolic processes (e.g., the rate of glucose metabolism) and, depending on the pathology, to more accurately localize abnormalities. PET radiolabelled sugar (i.e., fluorodeoxyglucose [¹⁸F–FDG]) is the most common PET tracer currently used in Canada, but other tracers are becoming available, especially for cardiac and neurological imaging. Another advantage of PET-CT imaging is that the whole body can be imaged, which is useful for assessing tumour spread or recurrence.

Medical specialties that commonly use PET imaging include oncology, neurology, psychiatry, cardiology, pediatrics, and infectious disease.

Disadvantages of Nuclear Imaging Modalities

SPECT exams may involve scanning over hours to days (at intervals), although the duration of the imaging may be similar to an MRI. Nuclear medicine also involves exposure to ionizing radiation, which means that the risk–benefit of its use in pregnancy and young children, and its repeated use, must be carefully assessed. Nuclear medicine scans have lower resolution than other imaging modalities.

The cost associated with obtaining and transporting medical radioisotopes is an ongoing concern.⁴⁵

Hybrid Medical Imaging Technologies

Hybrid imaging combines two or more imaging modalities to take advantage of the characteristics of each. Therefore, hybrid imaging can simultaneously provide high anatomic detail and metabolic and/or physiological function, enabling more accurate diagnosis, better care pathways, refined treatment regimes, and improved patient outcomes.⁴⁵

Single-Photon Emission Computed Tomography–Computed Tomography

Single-photon emission computed tomography–computed tomography (SPECT-CT) combines SPECT and CT to create three-dimensional images of the body part of interest, such as brain, bone, and heart. Its main advantage is that it offers both metabolic and physiologic information, coupled with the resolution of CT. During a hybrid SPECT-CT, both scans are performed in sequence; the images are then computationally aligned with each other to show anatomic and functional detail, and to enable attenuation correction of the SPECT signal. Medical specialties that commonly use SPECT-CT imaging include oncology, neurology, cardiology, internal medicine, and orthopedics.

The disadvantages of SPECT-CT are those of the component modalities, both of which involve exposure to ionizing radiation,⁴⁷ and concerns about availability of radioisotopes.

Positron Emission Tomography–Computed Tomography

Positron emission tomography–computed tomography (PET-CT) combines the modalities of PET and CT, creating three-dimensional images of the body part of interest, such as brain, bone, and lung. Both scans are performed in sequence during a single session, and the images are computationally aligned.⁴⁸ PET-CT is commonly used in oncology to diagnose and stage various types of cancers, such as lung, gastrointestinal, colorectal, breast, and thyroid cancer. Additionally, PET-CT is commonly employed to diagnose neurological, cardiovascular, infectious, and inflammatory pathologies, and the CT component is used to detect coronary artery calcification, a marker of coronary atherosclerosis.⁴⁵

The main advantage of PET-CT is the ability to demonstrate metabolic information with precise anatomic detail of multi-slice high-resolution CT images, to the extent that PET-CT has replaced PET in Canada. Medical specialties that commonly use PET-CT imaging include oncology, neurology, cardiology, internal medicine, and orthopedics.

The disadvantages of PET-CT are those of the component modalities, both of which involve exposure to ionizing radiation.^{45,49,50} The radioisotopes used in PET-CT have a half-life measured in hours, so imaging depends on availability of a cyclotron and radioisotope transportation.

Positron Emission Tomography–Magnetic Resonance Imaging

Positron emission tomography–magnetic resonance imaging (PET-MRI) combines PET with MRI,⁵¹ permitting high-sensitivity metabolic imaging with high resolution of soft tissue detail, enabling visualization of anatomy and pathologies not commonly attainable with other modalities. The two scans are performed in tandem, and the images are then computationally aligned. PET-MRI is the newest combination to reach clinical use and has applications in oncology, neurology, cardiology, internal medicine, and orthopedics.^{52,53}

PET-MRI requires injection of radioisotope tracers, and therefore requires the same risk–benefit assessment as other nuclear medicine imaging modalities for women of reproductive age and children.^{43,44} Since the CT component is replaced by MRI, X-ray exposure is avoided; however, the potential hazards of magnetic fields remain.^{43,44} The radioisotopes have a short half-life, necessitating proximity to a cyclotron. The units and their infrastructure requirements are extremely expensive.

Picture Archiving and Communication Systems

Picture archiving and communication system (PACS) refers to an electronic system used to digitally manage images, including transmission, filing, storage, distribution, and retrieval of medical images. It is networked and frequently Web-based. Combined with other Web-based telehealth technologies, PACS allows timely access to medical images and specialists. PACS has replaced film and film library systems.

Access to images outside medical imaging departments by referring and consulting physicians is important for efficient patient care, particularly in a country like Canada, with its geographic size and dispersed population.

Appendix B: Survey Questions for the 2017 Canadian Medical Imaging Inventory

Questions marked with an asterisk (*) were mandatory.

CMII Survey Questions 2017	
Site and facility information	<p>Name of Site: Street Address: Suite: City: Province: Postal code:</p> <p>*What type of facility is this?</p> <ul style="list-style-type: none"> • Hospital An institution where patients are provided with continuing medical care, and supporting diagnostic and therapeutic services. Hospitals are licensed or approved as hospitals by a provincial or territorial government or are operated by the Government of Canada. Included are those providing acute care. • Tertiary care A hospital that provides tertiary care, which is health care from specialists who investigate and treat patients in a large hospital after referral from primary care and secondary care facilities. • Community hospital A short-term (average length of stay with fewer than 30 days) hospital that provides acute care. • Free-standing Ranges from specialized services run privately by physicians, radiologists, dentists, chiropractors, or via mammography programs to broad-based imaging centres offering a wide range of tests. <p>*In which of the following settings are you located:</p> <ul style="list-style-type: none"> • Urban • Rural • Remote <p>*Facility Department: Comment box</p> <p>*How is this facility¹ funded?</p> <p>¹A single hospital or a hospital campus site that is part of an amalgamation of hospitals.</p> <ul style="list-style-type: none"> • Public • Private • Both (please provide details) (comment box)
Picture archiving and communication system (PACS)	<p>Are medical images stored in a picture archiving and communication system (PACS)?</p> <ul style="list-style-type: none"> • Yes • No • Don't know

	<p>If yes, which imaging modalities are stored on PACS? (check all that apply)</p> <ul style="list-style-type: none"> • CT • MRI • SPECT • PET-CT or PET • PET-MRI • SPECT-CT <p>Is your PACS</p> <ul style="list-style-type: none"> • Local (institutional) • Regional • Provincial <p>Do referring physicians have access to PACS images in areas of the hospital outside of diagnostic imaging (e.g., hospital clinics, the OR, case rounds meeting rooms, etc.)?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Are PACS images routinely accessible throughout your provincial health care system without the need to manually push images from any particular location/modality?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Do you have a process for determining the appropriateness of orders that are received?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
CT: machine types	<p>Do you have the following types of machines at the site?</p> <ul style="list-style-type: none"> • CT • MRI • SPECT • PET-CT or PET • PET-MRI • SPECT-CT <p>Do you have plans to install the following in the next two years?</p> <ul style="list-style-type: none"> • CT • MRI • SPECT • PET-CT or PET • PET-MRI • SPECT-CT

CT: make and model	* What is the make of the CT unit? GE Healthcare Hitachi Philips Siemens Toshiba Other If "Other" is selected, please comment.
	* What is the model of the CT unit? Comment box
	* What year did (or will) the CT unit become operational? 2000–2019
	* Has this unit been decommissioned? • Yes • No • Don't know If yes, what year was it decommissioned? 2000–2019
	CT: individual unit specifications
Is this CT unit new or previously used? • New • Previously used	
How many multidetectors does the CT unit have (how many slices)? 1,2,4,6,8,16,32,40,64,128,256,264,320,Other If "Other" is selected, please comment.	
Does the CT unit have a dual-energy option? • Yes • No • Don't know	
Does the CT unit have a dual-target option? • Yes • No • Don't know	
Does the CT unit have dose-management controls? • Yes • No • Don't know	
Does the CT unit incorporate image reconstruction techniques for dose reduction? • Yes • No • Don't know	
Does the CT unit record patient radiation dose by exam (e.g., as a save screen on PACS)? • Yes • No • Don't know	

	<p>Is the CT unit mobile¹?</p> <p>¹ Imaging equipment that travels to two or more communities to provide radiological services.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, please include the names of the sites that share the CT unit: Comment Box</p> <p>Is this CT unit a replacement for an existing CT unit? Please add the make and year of installation of the CT unit that is being replaced.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Replacement unit make – Comment Box</p> <p>Replaced unit year – Comment Box</p>
CT: usage	<p>For all CT units, how many examinations¹ on average were conducted in the last fiscal year?</p> <p>¹ An imaging exam is defined as a single medical imaging session using an imaging modality to study one (or more than one) body structure, body system, or anatomical area that yields one or more views for diagnostic and/or therapeutic purposes.</p> <p>Comment Box</p> <p>In an average 168-hour week, how many hours are the CT units in use? (Please average the hours for all units and express them as the total number of hours)</p> <p>In a regular 24-hour workday, how many hours are the CT units in use. (Please average the hours for all units and express them as the total number of hours)</p> <p>Do any CT units operate on the weekend?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Do any CT units operate 24 hours a day?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Based on your experience in the last fiscal year, what is the average percentage of overall time CT units are used for? (The total percentage, expressed as a number, must add up to 100.)</p> <ul style="list-style-type: none"> • Non-cardiac clinical purposes • Dedicated cardiac purposes, only • Research purposes • Other

	<p>On average what per cent of these exams fall into the following categories?</p> <ul style="list-style-type: none"> • Oncology • Respiratory disease • Hepatobiliary/GI • Musculoskeletal disorders • Inflammatory or Infectious diseases • Neurological • Cardiac • Trauma • Other <p>Are the CT units also used for radiation therapy treatment planning?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Have you decommissioned a CT unit since January 2, 2015?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was the CT unit decommissioned?</p> <p>1995–2016</p> <p>What year was the decommissioned CT unit originally installed?</p> <p>1995–2016</p> <p>What was the make of the decommissioned CT unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p>
MRI: make and model	<p>* What is the make of the MRI unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p> <p>* What is the model of the MRI unit?</p> <p>Comment box</p>

	<p>* What year did (or will) the MRI unit become operational? 2000–2019</p> <p>* Has this unit been decommissioned?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was it decommissioned? 2000–2019</p>
MRI: individual unit specifications	<p>Is this MRI unit new or previously used?</p> <ul style="list-style-type: none"> • New • Previously used
	<p>What is the field strength (Tesla) of the MRI unit?</p> <p>1.5 3 5 7 Other</p> <p>If "Other" is selected, please comment.</p>
	<p>What is the configuration of the MRI unit?</p> <ul style="list-style-type: none"> • Closed bore – normal • Closed bore – wide • Open bore
	<p>Is the MRI unit mobile¹?</p> <p>¹ Imaging equipment that travels to two or more communities to provide radiological services.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, please include the names of the sites that share the MRI unit: Comment Box</p>
	<p>Is this MRI unit a replacement for an existing MRI unit? Please add the make and year of installation of the MRI unit that is being replaced.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Replacement unit make – Comment Box</p> <p>Replaced unit year – Comment Box</p>

MRI: usage	<p>For all MRI units, how many examinations¹ on average were conducted in the last fiscal year?</p> <p>¹ An imaging exam is defined as a single medical imaging session using an imaging modality to study one (or more than one) body structure, body system, or anatomical area that yields one or more views for diagnostic and/or therapeutic purposes.</p> <p>Comment Box</p>
	<p>In an average 168-hour week, how many hours are the MRI units in use? (Please average the hours for all units and express them as the total number of hours)</p>
	<p>In a regular 24-hour workday, how many hours are the MRI units in use? (Please average the hours for all units and express them as the total number of hours)</p>
	<p>Do any MRI units operate on the weekend?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
	<p>Do any MRI units operate 24 hours a day?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
	<p>Based on your experience in the last fiscal year, what is the average percentage of overall time MRI units are used for? (The total percentage, expressed as a number, must add up to 100.)</p> <ul style="list-style-type: none"> • Non-cardiac clinical purposes • Dedicated cardiac purposes, only • Research purposes • Other
	<p>On average, what per cent of these exams fall into the following categories?</p> <ul style="list-style-type: none"> • Oncology • Respiratory disease • Hepatobiliary/GI • Musculoskeletal disorders • Neurological • Cardiac • Trauma • Other
	<p>Have you decommissioned an MRI unit since January 2, 2015?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was the MRI unit decommissioned?</p> <p>1995–2016</p>

	<p>What year was the decommissioned MRI unit originally installed? 1995–2016</p>
	<p>What was the make of the decommissioned MRI unit? GE Healthcare Hitachi Philips Siemens Toshiba Other If "Other" is selected, please comment.</p>
SPECT: Make and Model	<p>* What is the make of the SPECT unit? GE Healthcare Hitachi Philips Siemens Toshiba Other If "Other" is selected, please comment.</p>
	<p>* What is the model of the SPECT unit? Comment box</p>
	<p>* What year did (or will) the SPECT unit become operational? 2000-2019</p>
	<p>* Has this unit been decommissioned? • Yes • No • Don't know If yes, what year was it decommissioned? 2000-2019</p>
SPECT: individual unit specifications	<p>Is this SPECT unit new or previously used? • New • Previously used</p>
	<p>Is this a dedicated cardiac SPECT unit? • Yes • No • Don't know</p>
	<p>How many multidetectors does the CT unit have (how many slices)? 1,2,4,6,8,16,32,40,64,128,256,264,320,Other If "Other" is selected, please comment.</p>

	<p>How many detector heads does the SPECT unit have? 1,2,3</p>
	<p>What type of view does the SPECT unit have?</p> <ul style="list-style-type: none"> • Standard, multipurpose • Dedicated, limited • Other
	<p>What type of software is used for the SPECT unit?</p> <ul style="list-style-type: none"> • Filtered back projection • Interactive reconstruction
	<p>Is the SPECT unit mobile¹?</p> <p>¹ Imaging equipment that travels to two or more communities to provide radiological services.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, please include the names of the sites that share the SPECT unit: Comment Box</p>
	<p>Is this SPECT unit a replacement for an existing SPECT unit? Please add the make and year of installation of the SPECT unit that is being replaced.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Replacement unit make – Comment Box</p> <p>Replaced unit year – Comment Box</p>
SPECT: usage	<p>For all SPECT units, how many examinations¹ on average were conducted in the last fiscal year?</p> <p>¹ An imaging exam is defined as a single medical imaging session using an imaging modality to study one (or more than one) body structure, body system, or anatomical area that yields one or more views for diagnostic and/or therapeutic purposes.</p> <p>Comment Box</p> <p>In an average 168-hour week, how many hours are the SPECT units in use? (Please average the hours for all units and express them as the total number of hours)</p> <p>In a regular 24-hour workday, how many hours are the SPECT units in use? (Please average the hours for all units and express them as the total number of hours)</p> <p>Do any SPECT units operate on the weekend?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Do any SPECT units operate 24 hours a day?</p> <ul style="list-style-type: none"> • Yes • No • Don't know

	<p>Based on your experience in the last fiscal year, what is the average percentage of overall time SPECT units are used for? (The total percentage, expressed as a number, must add up to 100.)</p> <ul style="list-style-type: none"> • Non-cardiac clinical purposes • Dedicated cardiac purposes, only • Research purposes • Other <hr/> <p>On average, what per cent of these exams fall into the following categories?</p> <ul style="list-style-type: none"> • Oncology • Respiratory disease • Hepatobiliary/GI • Musculoskeletal disorders • Inflammatory or Infectious diseases • Neurological • Cardiac • Thyroid/parathyroid/ other endocrine • Other <hr/> <p>Are the SPECT units also used for radiation therapy treatment planning?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <hr/> <p>Have you decommissioned a SPECT unit since January 2, 2015?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was the SPECT unit decommissioned? 1995–2016</p> <hr/> <p>What year was the decommissioned SPECT unit originally installed? 1995–2016</p> <hr/> <p>What was the make of the decommissioned SPECT unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p>
<p>PET or PET-CT: make and model</p>	<p>* What is the make of the PET-CT or PET unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p> <hr/> <p>* What is the model of the PET-CT or PET unit?</p> <p>Comment box</p>

	<p>* What year did (or will) the PET-CT or PET unit become operational? 2000-2019</p> <p>* Has this unit been decommissioned?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was it decommissioned? 2000-2019</p>
PET or PET-CT: individual unit specifications	<p>Is this PET-CT or PET unit new or previously used?</p> <ul style="list-style-type: none"> • New • Previously used
	<p>What is the imaging scope of the PET-CT or PET unit?</p> <p>Head only</p> <p>Near whole body/full body</p>
	<p>How many slices does the CT component of the PET-CT unit have?</p> <p>1,2,4,6,8,16,32,40,64,128,256,264,320,Other</p> <p>If "Other" is selected, please comment.</p>
	<p>Do you use the CT component of your PET-CT or PET unit as a stand-alone CT unit for clinical CT examinations (i.e., to provide extra CT capacity)?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
	<p>Does the PET-CT or PET unit have dose-management controls?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
	<p>Does the PET-CT or PET unit incorporate image reconstruction techniques for dose reduction?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
	<p>Does the PET-CT or PET unit record patient CT radiation dose (e.g., as a save screen on PACS)?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
	<p>Is the PET-CT or PET unit mobile¹?</p> <p>¹ Imaging equipment that travels to two or more communities to provide radiological services.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, please include the names of the sites that share the PET-CT or PET unit: Comment Box</p>

	<p>Is this PET-CT or PET unit a replacement for an existing PET-CT or PET unit? Please add the make and year of installation of the PET-CT or PET unit that is being replaced.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Replacement unit make – Comment Box</p> <p>Replaced unit year – Comment Box</p>
<p>PET or PET-CT: usage</p>	<p>For all PET-CT or PET units, how many examinations¹ on average were conducted in the last fiscal year?</p> <p>¹ An imaging exam is defined as a single medical imaging session using an imaging modality to study one (or more than one) body structure, body system, or anatomical area that yields one or more views for diagnostic and/or therapeutic purposes.</p> <p>Comment Box</p> <p>In an average 168-hour week, how many hours are the PET-CT or PET units in use? (Please average the hours for all units and express them as the total number of hours)</p> <p>In a regular 24-hour workday, how many hours are the PET-CT or PET units in use? (Please average the hours for all units and express them as the total number of hours)</p> <p>Do any PET-CT or PET units operate on the weekend?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Do any PET-CT or PET units operate 24 hours a day?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Based on your experience in the last fiscal year, what is the average percentage of overall time PET-CT or PET units are used for? (The total percentage, expressed as a number, must add up to 100.)</p> <ul style="list-style-type: none"> • Non-cardiac clinical purposes • Dedicated cardiac purposes, only • Research purposes • Other <p>On average what per cent of these exams fall into the following categories?</p> <ul style="list-style-type: none"> • Oncology • Cardiac • Inflammatory or Infectious diseases • Neurological • Other <p>Are the PET-CT or PET units also used for radiation therapy treatment planning?</p> <ul style="list-style-type: none"> • Yes • No • Don't know

	<p>Does your facility¹ operate a cyclotron for the PET-CT or PET units?</p> <p>¹ A single hospital or a hospital campus site that is part of an amalgamation of hospitals.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, please describe the make and model of the cyclotron, if it is single or dual beam, and the energy level or energy level range (MeV). Comment Box</p> <hr/> <p>Have you decommissioned a PET-CT or PET unit since January 2, 2015?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was the PET-CT or PET unit decommissioned? 1995–2016</p> <hr/> <p>What year was the decommissioned PET-CT or PET unit originally installed? 1995–2016</p> <hr/> <p>What was the make of the decommissioned PET-CT or PET unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p>
<p>PET-MRI: make and model</p>	<p>* What is the make of the PET-MRI unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p> <hr/> <p>* What is the model of the PET-MRI unit? Comment box</p> <hr/> <p>* What year did (or will) the PET-MRI unit become operational? 2000–2019</p> <hr/> <p>* Has this unit been decommissioned?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, what year was it decommissioned? 2000–2019</p>

PET-MRI: individual unit specifications	Is this PET-MRI unit new or previously used?
	<ul style="list-style-type: none"> • New • Previously used
	What is the imaging scope of the PET-MRI unit?
	<ul style="list-style-type: none"> • Head only • Near whole body/full body
	Is the PET-MRI unit mobile ¹ ?
	¹ Imaging equipment that travels to two or more communities to provide radiological services.
	<ul style="list-style-type: none"> • Yes • No • Don't know
	If yes, please include the names of the sites that share the PET-MRI unit: Comment Box
	Is this PET-MRI unit a replacement for an existing PET-MRI unit? Please add the make and year of installation of the PET-MRI unit that is being replaced.
	<ul style="list-style-type: none"> • Yes • No • Don't know
Replacement unit make – Comment Box	
Replaced unit year – Comment Box	
* What is the make of the SPECT-CT unit?	
GE Healthcare Hitachi Philips Siemens Toshiba Other	
If "Other" is selected, please comment.	
* What is the model of the SPECT-CT unit?	
Comment box	
* What year did (or will) the SPECT-CT unit become operational?	
2000-2019	
* Has this unit been decommissioned?	
<ul style="list-style-type: none"> • Yes • No • Don't know 	
If yes, what year was it decommissioned?	
2000-2019	
SPECT-CT: individual unit specifications	Is this SPECT-CT unit new or previously used?
	<ul style="list-style-type: none"> • New • Previously used
SPECT-CT: individual unit specifications	Is this a dedicated cardiac SPECT-CT unit?
	<ul style="list-style-type: none"> • Yes • No • Don't know

<p>How many multidetectors does the SPECT-CT unit have (how many slices)?</p> <p>1,2,4,6,8,16,32,40,64,128,256,264,320,Other</p> <p>If "Other" is selected, please comment.</p>
<p>How many detector heads does the SPECT-CT unit have?</p> <p>1,2,3</p>
<p>What type of view does the SPECT-CT unit have?</p> <ul style="list-style-type: none"> • Standard, multipurpose • Dedicated, limited • Other
<p>What type of software is used for the SPECT-CT unit?</p> <ul style="list-style-type: none"> • Filtered back projection • Interactive reconstruction
<p>Do you use the CT component of your SPECT-CT unit as a stand-alone CT unit for clinical CT examinations (i.e., to provide extra CT capacity)?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
<p>Does the SPECT-CT unit have dose management controls?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
<p>Does the SPECT-CT unit incorporate image reconstruction techniques for dose reduction?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
<p>Does the SPECT-CT unit record patient CT radiation dose (e.g., as a save screen on PACS)?</p> <ul style="list-style-type: none"> • Yes • No • Don't know
<p>Is the SPECT-CT unit mobile¹?</p> <p>¹ Imaging equipment that travels to two or more communities to provide radiological services.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>If yes, please include the names of the sites that share the SPECT-CT unit: Comment Box</p>
<p>Is this SPECT-CT unit a replacement for an existing SPECT-CT unit? Please add the make and year of installation of the SPECT-CT unit that is being replaced.</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>Replacement unit make – Comment Box</p> <p>Replaced unit year – Comment Box</p>

SPECT-CT: usage	For all SPECT-CT units, how many examinations ¹ on average were conducted in the last fiscal year? ¹ An imaging exam is defined as a single medical imaging session using an imaging modality to study one (or more than one) body structure, body system, or anatomical area that yields one or more views for diagnostic and/or therapeutic purposes.
	Comment Box
	In an average 168-hour week, how many hours are the SPECT-CT units in use? (Please average the hours for all units and express them as the total number of hours)
	In a regular 24-hour workday, how many hours are the SPECT-CT units in use. (Please average the hours for all units and express them as the total number of hours)
	Do any SPECT-CT units operate on the weekend? <ul style="list-style-type: none"> • Yes • No • Don't know
	Do any SPECT-CT units operate 24 hours a day? <ul style="list-style-type: none"> • Yes • No • Don't know
	Based on your experience in the last fiscal year, what is the average percentage of overall time SPECT-CT units are used for? (The total percentage, expressed as a number, must add up to 100.) <ul style="list-style-type: none"> • Non-cardiac clinical purposes • Dedicated cardiac purposes, only • Research purposes • Other
	On average what per cent of these exams fall into the following categories. <ul style="list-style-type: none"> • Oncology • Respiratory disease • Hepatobiliary/GI • Musculoskeletal disorders • Inflammatory or Infectious diseases • Neurological • Cardiac • Thyroid/parathyroid/ other endocrine • Other
	Are the SPECT-CT units also used for radiation therapy treatment planning? <ul style="list-style-type: none"> • Yes • No • Don't know
	Have you decommissioned a SPECT-CT unit since January 2, 2015? <ul style="list-style-type: none"> • Yes • No • Don't know
If yes, what year was the SPECT-CT unit decommissioned? 1995–2016	
What year was the decommissioned SPECT-CT unit originally installed? 1995–2016	

	<p>What was the make of the decommissioned SPECT-CT unit?</p> <p>GE Healthcare Hitachi Philips Siemens Toshiba Other</p> <p>If "Other" is selected, please comment.</p>
--	---

CT = computed tomography; GE = General Electric; GI = gastrointestinal; MRI = magnetic resonance imaging; PACS = picture archiving and communication system; PET-CT = positron emission tomography-computed tomography; PET-MRI = positron emission tomography-magnetic resonance imaging; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography-computed tomography.

* Compulsory question.

Appendix C: Details of Facilities Responding to the Canadian Medical Imaging Inventory 2015 Update

Table 18: Summary of Type of Facility Included in the Canadian Medical Imaging Inventory 2017 Update

Province/Territory	Number of Sites ^{a,b}			
	Hospital	Community Hospital	Tertiary Care	Free-Standing
Alberta	29 (70.7)	8 (19.5)	1 (2.4)	3 (7.3)
British Columbia	33 (56.9)	7 (12.1)	4 (6.9)	14 (24.1)
Manitoba	1 (6.7)	11 (73.3)	2 (13.3)	1 (6.7)
New Brunswick	10 (100)			
Newfoundland and Labrador	10 (76.9)		1 (7.7)	2 (15.4)
Northwest Territories	1 (100)			
Nova Scotia	7 (41.2)	2 (11.8)	5 (29.4)	3 (17.6)
Nunavut	1 (100)			
Ontario	55 (63.2)	23 (26.4)	3 (3.4)	6 (6.9)
Prince Edward Island	2 (100)			
Quebec	45 (75)	2 (3.3)	5 (8.3)	8 (13.3)
Saskatchewan	13 (76.5)		1 (5.9)	3 (17.6)
Yukon	1 (100)			
All	209 (64.5)	53 (16.4)	22 (6.8)	40 (12.3)

^a Data derived from survey question: "What type of facility is this?" The four categories are mutually exclusive.

^b Sites that did not provide this information are not included in this table.

Table 19: Summary of Location of Facilities Included in the Canadian Medical Imaging Inventory 2017 Update

Province/Territory	Number of Sites ^{a,b}		
	Urban	Rural	Remote
Alberta	20 (50)	19 (47.5)	1 (2.5)
British Columbia	34 (70.8)	13 (27.1)	1 (2.1)
Manitoba	7 (50)	5 (35.7)	2 (14.3)
New Brunswick	2 (66.7)	1 (33.3)	
Newfoundland and Labrador	2 (33.3)	4 (66.7)	
Northwest Territories			1 (100)
Nova Scotia	9 (60)	6 (40)	
Ontario	34 (75.6)	11 (24.4)	
Prince Edward Island	2 (100)		
Quebec	33 (89.2)	4 (10.8)	
Saskatchewan	10 (90.9)	1 (9.1)	
Canada	154 (69.1)	64 (28.7)	5 (2.2)

^a Data derived from survey question: "In which of the following settings are you located?"

^b Sites that did not provide this information are not included in this table. No responses are available for Nunavut and Yukon.

Table 20: Summary of Source of Funding for Sites Included in the Canadian Medical Imaging Inventory 2017 Update

Province/Territory	Number of Sites ^{a,b}		
	Publicly	Privately	Both
Alberta	40 (97.6)		1 (2.4)
British Columbia	43 (75.4)	13 (22.8)	1 (1.8)
Manitoba	15 (100)		
New Brunswick	7 (100)		
Newfoundland and Labrador	13 (100)		
Northwest Territories	2 (100)		
Nova Scotia	15 (93.8)	1 (6.2)	
Ontario	90 (93.8)	4 (4.2)	2 (2.1)
Prince Edward Island	2 (100)		
Quebec	49 (81.7)	8 (13.3)	3 (5)
Saskatchewan	15 (83.3)	1 (5.6)	2 (11.1)
Yukon			1 (100)
Canada	209 (64.5)	53 (16.4)	40 (12.3)

^a Data derived from survey question: "How is this facility funded?"

^b Sites that did not provide this information are not included in this table. No response was available for Nunavut.

Appendix D: Summaries of Use Data

Table 21: Number of Exams Reported for the Most Recent Fiscal Year for All Modalities Across All Provinces

Province/Territory	Number of Exams					
	CT	MRI	PET-CT	PET-MRI	SPECT	SPECT-CT
Alberta	405,332 ^a	192,375 ^a	11,050 ^a	0	17,996 ^a	8,134 ^a
British Columbia	695,248 ^b	173,678 ^b	9,280 ^b	0	103,665 ^c	44,913 ^c
Manitoba	186,197	77,735	2,009	0	11,120	10,954
New Brunswick	142,294	44,592	1,808	0	15,067 ^{d,e}	3,262 ^e
						21,306 ^f
Newfoundland and Labrador	90,985	20,990	0	0	21,949 ^g	589 ^h
						27,297 ^c
Northwest Territories	4,695	0	0	0	0	0
Nova Scotia	155,099	47,490	2,512	0	9610 ^g	15,803
Nunavut	2,000	0	0	0	0	0
Ontario	2,430,739	866,953	10,998 ⁱ	5 ^c		200,833 ^j
Prince Edward Island	15,811	4,279	0	0	0	2,299 ^j
Quebec	1,350,792	380,357	50,823	0		786,594 ^j
Saskatchewan	128,415	44,461	2,050	0	Not available ^k	52,730 ^c
Yukon	3,500	0	0	0	0	0
Canada	5,611,107	1,855,110	90,530	0		1,354,121

CT = computed tomography; MRI = magnetic resonance imaging; PET-CT = positron emission tomography–computed tomography; PET-MRI = positron emission tomography–magnetic resonance imaging; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography–computed tomography.

^a Exams from Alberta Health Services only.

^b Exams from public sites only.

^c No validator information. Estimated from survey data, question: “For all [modality] units, how many examinations on average were conducted in the last fiscal year?”

^d Exams from Horizon Health Network.

^e All nuclear medicine exams, excluding bone density.

^f Exams from Vitalite Health Network.

^g Figures available for all nuclear medicine exams only.

^h Validated data from one site.

ⁱ Does not include public funding through special access, registries, or evidence-building trials.

^j Validated data only available for SPECT and SPECT-CT.

^k Insufficient data to allow imputation.

Table 22: Summary of Average Hours per Day of Use for All Modalities Across All Provinces

Province/Territory		Average Hours per Day ^{a,c}					
		CT	MRI	PET-CT	PET-MRI	SPECT	SPECT-CT
Alberta	n ^b	35	23	3	NA	10	15
	mean	10.7	11	10		8.9	8.9
	min-max	(0.5 to 24)	(2 to 17)	(8 to 12)		(5 to 16)	(6 to 16)
British Columbia	n ^b	34	22	1	NA	9	11
	mean	13.3	12.6	14.5		9.9	8.8
	min-max	(6 to 24)	(7.5 to 24)	(14.5 to 14.5)		(8 to 17)	(8 to 10)
Manitoba	n ^b	14	7	1	NA	4	4
	mean	12.9	14.2	8		8.4	8.4
	min-max	(8 to 22)	(9 to 17)	(8 to 8)		(8 to 9.5)	(8 to 9.5)
New Brunswick	n ^b	6	6	1	NA	1	3
	mean	9.5	9.2	6		8	8.3
	min-max	(8 to 11)	(7.5 to 10)				(8 to 9)
Newfoundland and Labrador	n ^b	12	5	NA	NA	2	3
	mean	9.6	12.1			7	9.3
	min-max	(5 to 19)	(7 to 14)				(7 to 14)
Northwest Territories	n ^b	1	NA	NA	NA	NA	NA
	mean	8.5					
	min-max						
Nova Scotia	n ^b	15	10	1	NA	5	8
	mean	11.1	11.8	8		8.3	8.5
	min-max	(8 to 24)	(9 to 16)			(8 to 9)	(8 to 9)
Ontario	n ^b	57	35	6	1	37	34
	mean	13.1	16.2	6.3	12	9	9
	min-max	(2.4 to 24)	(2.5 to 24)	(1 to 9)		(6.5 to 22.5)	(3 to 16)
Prince Edward Island	n ^b	2	1	NA	NA	NA	2
	mean	8.5	12				8
	min-max	(8.5 to 8.5)					
Quebec	n ^b	35	30	12	NA	5	5
	mean	12.9	12.7	9.2		9.7	10.8
	min-max	(4 to 24)	(6 to 24)	(4 to 15.8)		(7.5 to 16)	(8 to 16)
Saskatchewan	n ^b	13	5	1	NA	1	3
	mean	11.7	13.6	8		8	7
	min-max	(1 to 24)	(8 to 17.5)				
Yukon	n ^b	1	1	NA	NA	NA	NA
	mean	8	9				
	min-max						

CT = computed tomography; MRI = magnetic resonance imaging; PET-CT = positron emission tomography-computed tomography; PET-MRI = positron emission tomography-magnetic resonance imaging; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography-computed tomography.

^a Data derived from survey question: "In a regular 24-hour workday, how many hours are the [modality] units in use?"

^b Number of sites contributing responses. Sites that did not provide responses are not included in these summaries.

^c NA indicates data not available, either because province does not have modality, or no sites reported examination data. No data are available for Nunavut.

Table 23: Summary of 24-Hour Use for All Modalities Across All Provinces

Province/Territory	Number ^a , b (%) of Sites With 24-Hour Use		
	CT	MRI	PET-MRI
Alberta	8 (25)	1 (6.2)	0
British Columbia	13 (44.8)	1 (6.2)	0
Manitoba	3 (25)	0 (0)	0
New Brunswick	0 (0)	0 (0)	0
Newfoundland and Labrador	0 (0)	0 (0)	0
Northwest Territories	0 (0)	0	0
Nova Scotia	14 (100)	1 (14.3)	0
Ontario	17 (51.5)	7 (33.3)	1 (100)
Prince Edward Island	0 (0)	0 (0)	0
Quebec	8 (50)	1 (7.1)	0
Saskatchewan	2 (28.6)	0 (0)	0

CT = computed tomography; MRI = magnetic resonance imaging; PET-MRI = positron emission tomography–magnetic resonance imaging.

^a Data derived from survey question: “Do any [modality] units operate on 24 hours a day?”

^b Sites that did not provide responses are not included in these summaries. No data are available for Nunavut and Yukon.

Table 24: Average Hours per Week of Use for All Modalities Across All Provinces

Province/Territory		Average Hours per Week ^{a,c}					
		CT	MRI	PET-CT	PET-MRI	SPECT	SPECT-CT
Alberta	n ^b	35	23	3	NA	10	15
	mean	63.1	63.2	50		44.8	45.8
	min-max	(1 to 168)	(10 to 128)	(40 to 60)		(25 to 80)	(30 to 96)
British Columbia	n ^b	35	21	1	NA	9	11
	mean	88.3	70.5	79		46.2	44.1
	min-max	(25.29 to 168)	(24 to 152)			(8 to 85)	(40 to 50)
Manitoba	n ^b	14	7	1	NA	4	4
	mean	80.1	93.5	40		42.2	42.2
	min-max	(40 to 146)	(45 to 119)			(40 to 47.5)	(40 to 47.5)
New Brunswick	n ^b	6	6	1	NA	2	3
	mean	61.8	45	18		40	41.7
	min-max	(52.5 to 77)	(24 to 70)			(40 to 40)	(40 to 45)
Newfoundland and Labrador	n ^b	12	5	NA	NA	2	3
	mean	52.4	60.5			35	46.7
	min-max	(24 to 95)	(35 to 70)			(35 to 35)	(35 to 70)
Northwest Territories	n ^b	1	NA	NA	NA	NA	NA
	mean	47					
	min-max						
Nova Scotia	n ^b	15	10	1	NA	5	8
	mean	65.8	68.2	32		41.5	42.5
	min-max	(32.5 to 168)	(45 to 123)			(40 to 45)	(40 to 45)
Ontario	n ^b	56	35	5	1	37	34
	mean	82.9	108.6	29	100	43.1	46.1
	min-max	(22.5 to 168)	(37.5 to 168)	(5 to 45)		(30 to 80)	(15 to 88)
Prince Edward Island	n ^b	2	1	NA	NA	NA	2
	mean	46.5	60				42.5
	min-max	(42.5 to 50.5)					
Quebec	n ^b	36	30	12	NA	5	5
	mean	85.9	72	42.9		49.4	54
	min-max	(12 to 168)	(30 to 134)	(10 to 79)		(40 to 80)	(40 to 80)
Saskatchewan	n ^b	14	5	1	NA	1	3
	mean	74	84.4	30		40	35
	min-max	(1 to 168)	(40 to 115.5)				(35 to 35)
Yukon	n ^b	1	1	NA	NA	NA	NA
	mean	40	40				
	min-max						

CT = computed tomography; MRI = magnetic resonance imaging; PET-CT = positron emission tomography-computed tomography; PET-MRI = positron emission tomography-magnetic resonance imaging; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography-computed tomography.

^a Data derived from survey question: "In a regular 168-hour work week, how many hours are the [modality] units in use?"

^b Number of sites contributing responses. Sites that did not provide responses are not included in these summaries. No data are available for Nunavut and Yukon.

^c NA indicates data not available, either because province does not have modality, or no sites reported data. No data are available for Nunavut.

Table 25: Summary of Weekend Use for All Modalities Across All Provinces

Province/Territory	Number ^{a, b} (%) of Sites With Weekend Use					
	CT	MRI	PET-CT	PET-MRI	SPECT	SPECT-CT
Alberta	17 (48.6)	9 (39.1)	0 (0)	0	0 (0)	1 (6.7)
British Columbia	30 (83.3)	15 (68.2)	1 (100)	0	2 (20)	2 (16.7)
Manitoba	10 (71.4)	6 (85.7)	0 (0)	0	1 (25)	0 (0)
New Brunswick	6 (100)	0 (0)	0 (0)	0	0 (0)	0 (0)
Newfoundland and Labrador	2 (15.4)	0 (0)	0	0	0 (0)	0 (0)
Northwest Territories	1 (100)	0	0	0	0	0
Nova Scotia	15 (100)	3 (30)	0 (0)	0	0 (0)	0 (0)
Ontario	48 (84.2)	31 (86.1)	0 (0)	1 (100)	3 (8.6)	4 (12.5)
Prince Edward Island	2 (100)	0 (0)	0	0	0 (0)	0 (0)
Quebec	33 (91.7)	15 (51.7)	1 (8.3)	0	3 (60)	2 (33.3)
Saskatchewan	10 (71.4)	4 (80)	0 (0)	0	0 (0)	0 (0)

CT = computed tomography; MRI = magnetic resonance imaging; PET-CT = positron emission tomography-computed tomography; PET-MRI = positron emission tomography-magnetic resonance imaging; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography-computed tomography.

^a Data derived from survey question: "Do any [modality] units operate on the weekend?"

^b Sites that did not provide responses are not included in these summaries. No data are available for Nunavut and Northwest Territories.

Table 26: Summary of Type of Use (Cardiac, Non-Cardiac, Research and Other)

Type of Use		Average Percentage of Use for Each Category ^a					
		CT	MRI	PET-CT	PET-MRI	SPECT	SPECT-CT
Cardiac	n ^b	157	85	19	1	49	55
	mean	1.3	3.6	12.1	50	26.3	21.5
	min-max	(0 to 15)	(0 to 50)	(0 to 80)		(0 to 100)	(0 to 85)
Non-cardiac	n ^b	159	86	19	1	50	55
	mean	94.6	85.7	80.7	0	73.9	78.1
	min-max	(0 to 100)	(0 to 100)	(20 to 100)		(0 to 100)	(15 to 100)
Other	n ^b	159	85	19	1	50	55
	mean	3.5	4.3	0.4	50	0	0.2
	min-max	(0 to 100)	(0 to 100)	(0 to 7)		(0 to 0)	(0 to 10)
Research	n ^b	159	85	19	1	49	55
	mean	0.6	1.6	6.8	0	0.3	0.1
	min-max	(0 to 30)	(0 to 50)	(0 to 50)		(0 to 10)	(0 to 2)

CT = computed tomography; MRI = magnetic resonance imaging; PET-CT = positron emission tomography-computed tomography; PET-MRI = positron emission tomography-magnetic resonance imaging; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography-computed tomography.

^a Data derived from survey question: "Based on your experience in the last fiscal year, what is the average percentage of overall time CT units are used for? (The total percentage, expressed as a number, must add up to 100): Non-cardiac clinical purposes, Dedicated cardiac purposes, only, Research purposes, Other."

^b Number of sites contributing responses. Sites that did not provide responses are not included in these summaries.

Table 27: Summary of Type of Use (by Discipline) for All Modalities

Type of Use		Average Percentage of Use for Each Category ^a				
		CT	MRI	PET-CT	SPECT	SPECT-CT
Cardiac	n ^b	63	34	13	19	15
	mean	2.3	3.5	10.7	39.8	35.7
	min-max	(0 to 20)	(0 to 35)	(0 to 95)	(0 to 100)	(0 to 100)
Hepatobiliary	n ^b	63	34	13	19	15
	mean	11.5	11.3	0	4.4	2.4
	min-max	(0 to 35)	(0 to 25)	(0 to 0)	(0 to 15)	(0 to 15)
Inflammatory	n ^b	NA ^c	34	13	19	15
	mean		0	1.2	3.2	4.5
	min-max		(0 to 0)	(0 to 5)	(0 to 15)	(0 to 15)
Lymphatic	n ^b	63	34	13	19	15
	mean	0	0	0	2.3	2.3
	min-max	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 8)	(0 to 10)
Musculoskeletal	n ^b	63	34	13	19	15
	mean	8.7	27.3	0	10.4	18.7
	min-max	(0 to 75)	(0 to 70)	(0 to 0)	(0 to 48)	(0 to 90)
Neurological	n ^b	63	34	13	19	15
	mean	18.9	25.4	7	0.3	1.8
	min-max	(0 to 55)	(0 to 45)	(0 to 50)	(0 to 2)	(0 to 20)
Oncology	n ^b	63	34	13	19	15
	mean	23.1	20.8	80.2	24.7	25.3
	min-max	(0 to 100)	(0 to 100)	(0 to 100)	(0 to 100)	(0 to 100)
Other category	n ^b	63	34	13	19	15
	mean	6.8	7.1	0.9	4.1	1.4
	min-max	(0 to 100)	(0 to 100)	(0 to 10)	(0 to 24)	(0 to 7)
Respiratory	n ^b	63	34	13	19	15
	mean	12.6	3.1	0	7.2	4.7
	min-max	(0 to 30)	(0 to 24)	(0 to 0)	(0 to 65)	(0 to 19)
Thyroid	n ^b	63	34	13	19	15
	mean	0	0	0	3.9	3.2
	min-max	(0 to 0)	(0 to 0)	(0 to 0)	(0 to 20)	(0 to 9)
Trauma	n ^b	63	NA ^c	13	19	15
	mean	9.5		0	0	0
	min-max	(0 to 65)		(0 to 0)	(0 to 0)	(0 to 0)

CT = computed tomography; MRI = magnetic resonance imaging; PET = positron emission tomography; PET-CT = positron emission tomography-computed tomography; SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography-computed tomography.

^a Data derived from survey question: "On average what per cent of these exams fall into the following categories?" (Categories varied according to modality).

^b Number of sites contributing responses. Sites that did not provide responses are not included in these summaries.

^c NA category was not applicable to that modality.

Appendix E: Comparison of Units and Exams between 2015 and 2017

Table 28: Comparison of Units and Exams Between 2015 and 2017 for CT

Province / Territory	2015		2017		2015		2017	
	Units ^{a,b}	Units per Million Population ^e	Units ^{a,b}	Units per Million Population ^f	Exams ^c	Exams per Thousand Population ^e	Exams ^{d,b}	Exams per Thousand Population ^f
Alberta	50	11.91	56	13.05	382,300	91.1	405,332	94.4
British Columbia	65	13.88	66 ^g	13.78	634,530	135.5	695,248	145.2
Manitoba	19	14.69	23	17.26	173,299	134.0	186,197	139.7
New Brunswick	14	18.57	15	19.80	130,984	173.7	142,294	187.8
Newfoundland and Labrador	16	30.31	16	30.26	115,552	218.9	90,985	172.1
Northwest Territories	1	22.68	1	22.53	--	--	4,695	105.8
Nova Scotia	19	22.27	18	18.88	157,290	166.8	155,099	162.7
Nunavut	1	27.10	1	26.69			2,000	53.4
Ontario	186	13.49	184	13.02	1,871,160	135.7	2,430,739	172.0
Prince Edward Island	2	13.66	2	13.35	13,576	92.7	15,811	105.6
Quebec	146	17.67	163 ^g	19.47	1,656,662	200.5	1,350,792	161.4
Saskatchewan	16	14.11	15	12.92	139,488	123.0	128,415	110.6
Yukon	1	26.74	1	26.45	3,500	93.6	3,500	92.6
Canada	538	15.01	561	15.33	5,278,341	147.0	5,611,107	153.0

CT = computed tomography.

Source: 2015 data were collected for the 2015 iteration of the Canadian Medical Imaging Inventory.

^a Unit counts supplied by provincial validators.

^b Unless otherwise indicated, values (units or exams) include publicly funded sites only.

^c Total exams for each province were calculated from exams reported by survey respondents, with imputation of missing data. If there were no available data for a province, the total was zero.

^d Exam data supplied by provincial validators, except where otherwise indicated.

^e Calculated from the population estimated as of July 1, 2015.

^f Calculated from the population estimated as of July 1, 2017.

^g Values include privately funded units.

Table 29: Comparison of Units and Exams Between 2015 and 2017 for MRI

Province / Territory	2015		2017		2015		2017	
	Units ^{a,b}	Units per million population ^e	Units ^{a,b}	Units per million population ^f	Exams ^c	Exams per thousand population ^e	Exams ^{d,b}	Exams per thousand population ^f
Alberta	41	9.77	41	9.55	236,406	56.3	192,375	44.8
British Columbia	42	8.97	46 ^g	9.60	154,098	32.9	173,678	36.3
Manitoba	10	7.73	12	9.00	73,460	56.8	77,735	58.3
New Brunswick	10	13.26	11	14.52	41,310	54.8	44,592	58.9
Newfoundland and Labrador	5	9.47	5	9.46	22,265	42.2	20,990	39.7
Northwest Territories	0	0.00	0	0.00	0	0.00	0	0.00
Nova Scotia	11	11.66	12	12.59	44,187	46.9	47,490	49.8
Nunavut	0	0.00	0	0.00	0	0.00	0	0.00
Ontario	125	9.06	120	8.49	974,500	70.7	866,953	61.3
Prince Edward Island	1	6.83	1	6.68	4,567	31.2	4,279	28.6
Quebec	85	10.29	107 ^g	12.78	349,945	42.3	380,357	45.4
Saskatchewan	9	7.94	10	8.61	49,122	43.3	44,461	38.3
Yukon	1	26.74	1	26.45	2,200	58.8	2,200	58.2
Canada	340	9.48	366	10.00	1,952,060	54.0	1,855,110	51.0

MRI = magnetic resonance imaging.

Source: 2015 data were collected for the 2015 iteration of the Canadian Medical Imaging Inventory.

^a Unit counts supplied by provincial validators.

^b Unless otherwise indicated, values (units or exams) include publicly funded sites only.

^c Total exams for each province were calculated from exams reported by survey respondents, with imputation of missing data. If there were no available data for a province, the total was zero.

^d Exam data supplied by provincial validators, except where otherwise indicated.

^e Calculated from the population estimated as of July 1, 2015.

^f Calculated from the population estimated as of July 1, 2017.

^g Values include privately funded units.

Table 30: Comparison of Units and Exams Between 2015 and 2017 for PET-CT

Province / Territory	2015		2017		2015		2017	
	Units ^{a,b}	Units per million population ^e	Units ^{a,b}	Units per million population ^f	Exams ^c	Exams per thousand population ^e	Exams ^{d,b}	Exams per thousand population ^f
Alberta	4	0.95	4	0.93	9,896	2.4	11,050	2.6
British Columbia	3	0.64	3 ^g	0.63	8,028	1.7	9,280	1.9
Manitoba	1	0.77	1	0.75	1,741	1.3	2,009	1.5
New Brunswick	2	2.65	2	2.64	1,458	1.9	1,808	2.4
Newfoundland and Labrador	0	0.00	1	1.89	0	0.0	0	0.0
Northwest Territories	0	0.00	0	0.00	0	0.0	0	0
Nova Scotia	1	1.06	1	1.05	2,241	2.4	2,512	2.6
Nunavut	0	0.00	0	0.00			0	0
Ontario	15	1.09	17 ^g	1.20	9,825	0.7	10,998	0.8
Prince Edward Island	0	0.00	0	0.00	0	0.0	0	0.0
Quebec	20	2.42	21 ^g	2.51	42,320	5.1	50,823	6.1
Saskatchewan	1	0.88	1	0.86	1,315	1.2	2,050	1.8
Yukon	0	0.00	0	0.00			0	0.0
Canada	47	1.31	51	1.39	76,824	2.0	90,530	2.0

PET-CT = positron emission tomography–computed tomography.

Source: 2015 data were collected for the 2015 iteration of the Canadian Medical Imaging Inventory.

^a Unit counts supplied by provincial validators.

^b Unless otherwise indicated, values (units or exams) include publicly funded sites only.

^c Total exams for each province were calculated from exams reported by survey respondents, with imputation of missing data. If there were no available data for a province, the total was zero.

^d Exam data supplied by provincial validators, except where otherwise indicated.

^e Calculated from the population estimated as of July 1, 2015.

^f Calculated from the population estimated as of July 1, 2017.

^g Values include privately funded units.

Table 31: Comparison of Units and Exams Between 2015 and 2017 for SPECT and SPECT-CT

Province / Territory	2015		2017		2015		2017	
	Units ^{a,b}	Units per million population ^e	Units ^{a,b}	Units per million population ^f	Exams ^c	Exams per thousand population ^e	Exams ^{d,b}	Exams per thousand population ^f
Alberta	65	15.49	74	17.25	107,325	25.8	26,130	6.1
British Columbia	53	11.32	59	12.32	86,264	18.4	148,578	31.0
Manitoba	15	11.6	17	12.75	22,935	17.7	22,074	16.6
New Brunswick	6	7.96	10	13.2	12,000	15.9	39,635	52.3
Newfoundland and Labrador	9	17.05	11	20.8			49,835	94.3
Northwest Territories	0	0	17	17.83			25,413	26.7
Nova Scotia	16	16.96	0	0	18,633	19.8	0	0.0
Nunavut	0	0	0	0			0	0.0
Ontario	137	9.94	229	16.2	248,494	18.0	200,833	14.2
Prince Edward Island	2	13.66	2	13.35	2,119	14.5	2,299	15.3
Quebec	156	18.88	153 ^g	18.28	939,700	113.7	786,594	94.0
Saskatchewan	19	16.76	19	16.36	47,826	42.2	52,730	45.4
Yukon	0	0	0	0			0	0.0
Canada	478	13.33	591	16.15	1,485,296	41.4	1,354,121	37.0

SPECT = single-photon emission computed tomography; SPECT-CT = single-photon emission computed tomography– computed tomography.

Source: 2015 data were collected for the 2015 iteration of the Canadian Medical Imaging Inventory.

^a Unit counts supplied by provincial validators.

^b Unless otherwise indicated, values (units or exams) include publicly funded sites only.

^c Total exams for each province were calculated from exams reported by survey respondents, with imputation of missing data. If there were no available data for a province, the total was zero.

^d Exam data supplied by provincial validators, except where otherwise indicated.

^e Calculated from the population estimated as of July 1, 2015.

^f Calculated from the population estimated as of July 1, 2017.

^g Values include privately funded units.