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Optimal Team for Diagnostic Imaging Equipment Installation



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Key Messages

- As jurisdictions expand imaging capacity to meet rising demand, incorporating diverse perspectives from those involved in the equipment's use and installation may optimize health care resource value.
- Information on the composition of the team involved in consultations on the replacement or installation of new imaging equipment is not well reported in the literature. An informal survey provided a snapshot of the professionals involved in this process across Canada.
- While there are some differences in the professionals engaged in consultations on the replacement or installation of new imaging equipment, many similarities exist across the country.
- The most commonly engaged professionals include diagnostic imaging (DI) technologists, managers and directors of imaging departments, medical physicists, and procurement staff.
- Other commonly consulted professionals include radiologists, project managers, electrical planners, architects, mechanical planners, and picture and archive communication system (PACS) coordinators.
- Gaining insight into the diverse professional perspectives involved in the planning, design, construction, installation, and use of equipment may enhance the optimization of imaging services by identifying valuable perspectives that may drive effective implementation and operation.

Context

All medical imaging equipment eventually needs to be replaced because of wear and tear or technological advances that render older models obsolete. New imaging equipment installations are also needed to accommodate increases in demand and expanding clinical indications.¹ This equipment can cost millions of dollars, and even seemingly minor changes can lead to significant financial repercussions. Therefore, careful planning is needed to ensure optimal operational functionality and cost-efficiency.²

Setting up a new imaging facility or undergoing construction of an existing one, can be a complex process with multiple considerations. The engagement of a team of experienced professionals, with unique perspectives on the planning, design, construction, installation, and use of the equipment, can help to ensure the successful implementation and operationalization of imaging services.^{3,4}

Involving a multidisciplinary team with diverse expertise ensures that all factors that affect the successful operation of new DI equipment and effective patient care are thoroughly considered.^{3,4} With comprehensive planning, the installation of new DI equipment can improve workflow and increase patient and user satisfaction.⁴

As jurisdictions consider enhancing imaging capacity to accommodate the increased demand for these services, decision-makers may be interested in the composition of the teams engaged in the consultations on the replacement or installation of equipment to maximize value from health care resources.

Objective

The purpose of this report is to summarize information, collected through a survey using the Canadian Medical Imaging Inventory's (CMII's) network of contacts, on the composition of teams involved in consultations on the replacement or installation of any type of new imaging equipment across Canada.

Methods

This document summarizes information from provincial, regional, and hospital-based contacts who were informally asked to provide information on team members who were consulted on projects that involved the replacement or installation of new imaging equipment at a health care facility.

A brief survey was sent to 29 key decision-makers and/or administrators, identified through the CMII network of contacts, across all 10 provinces. These contacts were asked to answer specific questions but were not required to disclose their province or location. 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 to participate in this survey because of the rapid timelines for this report. The responses reflect general practices across either a region or province, and in some instances, hospital-level practices are reported.

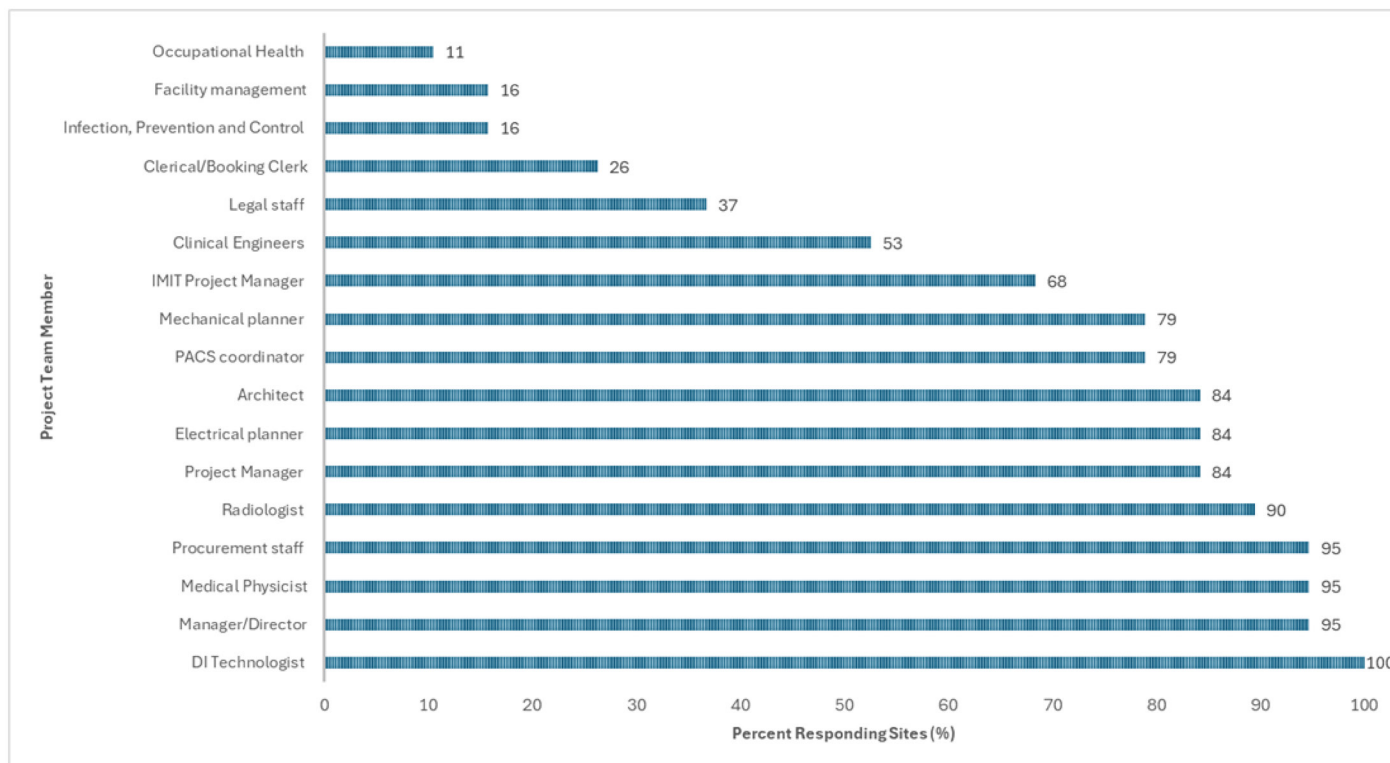
Results

The composition of professionals engaged in various aspects of the planning, design, construction, and installation of new imaging equipment are presented in descending order of consultation frequency. Data were collected from contacts in all 10 provinces and 19 survey responses were received out of a total of 29 surveys (66% response rate) that were disseminated.

- In 6 provinces, a single contact provided information representative of provincial practice (Alberta, Manitoba, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, and Saskatchewan).
- In 2 provinces multiple responses were provided, representing regional practices (British Columbia: 5 responses; New Brunswick: 2 responses).
- In 2 provinces, site-level practices were reported (Ontario: 4 responses; Quebec: 2 responses).

The data presented here provide a snapshot of practices across Canada. All survey responders indicated that a DI technologist was involved in the replacement or installation of imaging equipment. Most survey responders engaged a manager or director of an imaging department, a medical physicist, procurement staff, and a radiologist in the replacement or installation of imaging equipment. In contrast, legal staff; a clerical and/or booking clerk; infection, prevention, and control; facility management; and occupational health were less frequently engaged during the replacement or installation of imaging equipment.

Figure 1: Composition of DI Installation Project Team



DI = diagnostic imaging; IMIT = information management and information technology; PACS = picture archiving and communication system.

DI Technologists

DI technologists are primarily responsible for producing high-quality diagnostic images or carrying out diagnostic procedures involving ionizing radiation.⁵

All survey responders, whether at the provincial, regional, or facility level, indicated the engagement of DI technologists when consulting on the replacement or installation of new imaging equipment (Figure 1).

Managers or Directors of Imaging Departments

Managers and directors are responsible for the planning, coordinating, and administration of DI services. They oversee policies, programs, and procedures and are involved in training, supervising, and evaluating employees.⁶

In 18 out of 19 cases, the survey respondents reported that managers or directors of imaging departments were consulted on the replacement or installation of new imaging equipment (Figure 1).

- Provincial-level responses showed that managers or directors of imaging departments were engaged in all 6 jurisdictions.
- Regional-level responses showed that managers or directors of imaging were engaged in all cases (7 out of 7).

- At the facility level, 5 out of 6 respondents reported that managers or directors of imaging departments were part of the consultation process.

Medical Physicists

Medical physicists work on optimizing the use and functionality of DI equipment. Their responsibilities may include selecting and purchasing equipment, accrediting imaging systems, evaluating technical specifications, conducting acceptance testing, and performing periodic audits and safety evaluations.⁵

In 18 out of 19 cases, the survey respondents reported that medical physicists were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that medical physicists were engaged in all 6 jurisdictions.
 - It was noted by 2 respondents that medical physicists were consulted only if needed.
 - One respondent specified that a medical physicist was involved in the design of the shielding as well as in equipment acceptance testing.
- Regional-level responses showed that medical physicists were engaged in all cases (7 out of 7).
 - One respondent specified the involvement of a medical physicist for the installation of MRI units exclusively.
- At the facility level, 5 out of 6 respondents reported that medical physicists were part of the consultation process.

Procurement Staff

Procurement officers source and acquire general and specialized equipment, materials, and business services. Their responsibilities include purchasing products, determining the best value for materials, and analyzing market and delivery systems.⁷

In 18 out of 19 cases, the survey respondents reported that procurement staff were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that procurement staff were engaged in 5 out of 6 jurisdictions.
- Regional-level responses showed that procurement staff were engaged in all cases (7 out of 7).
- At the facility level, all 6 respondents reported that procurement staff were part of the consultation process.

Radiologists

Radiologists are physicians who specialize in medical imaging to diagnose and treat illnesses. Their responsibilities include interpreting images and performing procedures such as biopsies and other interventions.⁵

In 17 out of 19 cases, the survey respondents reported that radiologists were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that radiologists were engaged in 5 out of 6 jurisdictions.

- Regional-level responses showed that radiologists were engaged in all cases (7 out of 7).
- At the facility level, 5 out of 6 respondents reported that radiologists were part of the consultation process.

Project Managers

Project managers lead projects from initiation to close, ensuring tasks are completed efficiently and deliverables are met on time. They plan and develop ideas, assign team members, monitor project progress and set deadlines, as well as create and manage the project budget.⁸

In 16 out of 19 cases, the survey respondents reported that project managers were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that project managers were engaged in 4 out of 6 jurisdictions.
- Regional-level responses showed that project managers were engaged in all cases (7 out of 7).
- At the facility level, 5 out of 6 respondents reported that project managers were part of the consultation process.

Electrical Planners

Electrical planners are typically responsible for creating and maintaining electrical plans during the installation of new medical equipment.⁹

In 16 out of 19 cases, the survey respondents reported that electrical planners were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that electrical planners were engaged in 4 out of 6 jurisdictions.
- Regional-level responses showed that electrical planners were engaged in 6 out of 7 cases.
- At the facility level, all respondents reported that electrical planners were part of the consultation process (6 out of 6).

Architects

Architects are responsible for designing and planning buildings and other structures. Their responsibilities often include overseeing projects from conception to completion.¹⁰

In 16 out of 19 cases, the survey respondents reported that architects were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that architects were engaged in 5 out of 6 jurisdictions.
 - A provincial-level responder indicated that an architect was only involved if the scope of the installation required significant design.
- Regional-level responses showed that architects were engaged in 6 out of 7 cases.
- At the facility level, 5 out of 6 respondents reported that architects were part of the consultation process.

PACS Coordinators

PACS coordinators are responsible for overseeing the installation, coordination, and operation of PACS, as well as managing related initiatives and implementations.¹¹

In 15 out of 19 cases, the survey respondents reported that PACS coordinators were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that PACS coordinators were engaged in 5 out of 6 jurisdictions.
- Regional-level responses showed that PACS coordinators were engaged in 5 out of 7 cases.
- At the facility level, 5 out of 6 respondents reported that PACS coordinators were involved in the consultation process.

Mechanical Planners

Mechanical planners manage equipment maintenance schedules and downtime, as well as provide recommendations to enhance equipment performance and resource management.¹²

In 15 out of 19 cases, the survey respondents reported that mechanical planners were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that mechanical planners were engaged in 4 out of 6 jurisdictions.
- Regional-level responses showed that mechanical planners were engaged in 6 out of 7 cases.
- At the facility level, 5 out of 6 respondents reported that mechanical planners were involved in the consultation process.

Information Management and Information Technology Project Managers

Information Management and Information Technology (IMIT) project managers oversee IT projects through all stages of equipment installation, from planning and execution through to evaluation.¹³

In 13 out of 19 cases, the survey respondents reported that IMIT project managers were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that IMIT project managers were engaged in 3 out of 6 jurisdictions.
 - One provincial respondent noted that the involvement of an IMIT project manager had become more common because of security and safety checks.
- Regional-level responses showed that IMIT project managers were engaged in 4 out of 7 cases.
- At the facility level, all respondents reported that IMIT project managers were involved in the consultation process (6 out of 6).

Clinical Engineers

Clinical engineers are responsible for new technology assessments, technical market analysis, equipment planning, and managing external service contracts.¹⁴

In 10 out of 19 cases, the survey respondents reported that clinical engineers were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that clinical engineers were engaged in 4 out of 6 jurisdictions.
 - In 1 province, the involvement of clinical engineers varied depending on the project.
 - Another province reported the participation of a biomedical engineer.
 - A different province noted that a facility engineer was engaged.
 - Additionally, 1 province indicated that a biomedical technician was engaged in the consultation process.
- Regional-level responses showed that clinical engineers were engaged in 2 out of 7 cases.
 - One regional respondent specified that a biomedical engineer was engaged in the consultation process.
- At the facility level, 4 out of 6 respondents reported that clinical engineers were involved in the consultation process.
 - One respondent noted that a biomedical engineer was among those involved.

Legal Staff

Legal staff are involved in the drafting and negotiation of contracts, as well as researching laws and regulations that can affect the facility and those that pertain to the installation of new imaging equipment.¹⁵

In 7 out of 19 cases, the survey respondents reported that legal staff were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that legal staff were engaged in 3 out of 6 jurisdictions.
 - One province indicated that legal staff were involved in equipment and construction contracts.
 - Another province noted that an insurance advisor was consulted as part of the legal staff.
- Regional-level responses showed that legal staff were engaged in 3 out of 7 cases.
 - One regional responder indicated that legal staff were consulted during the procurement phase.
 - Another respondent noted that legal staff were consulted when needed.
- At the facility level, 1 out of 6 respondents reported that legal staff were involved in the consultation process.

Clerical and/or Booking Clerks

Booking clerks' responsibilities include organizing patient records, handling intake and discharge documentation, processing orders, and scheduling follow-up appointments. They may also be involved in transcribing orders and reports, along with ordering supplies and equipment.¹⁶

In 5 out of 19 cases, the survey respondents reported that clerical and/or booking clerks were consulted on the replacement or installation of new imaging equipment ([Figure 1](#)).

- Provincial-level responses showed that clerical and/or booking clerks were engaged in 1 out of 6 jurisdictions.
- Regional-level responses showed that clerical and/or booking clerks were engaged in 3 out of 7 cases.
- At the facility level, 1 out of 6 respondents reported that clerical and/or booking clerks were involved in the consultation process.

Additional Team Members

Additional staff engaged in consultations on the replacement or installation of new imaging equipment noted as “other” by survey responders included:

- infection, prevention and control officers and/or practitioners (3 responses)
- facility management representatives (3 responses)
- occupational health representatives (3 responses)
- contractor specialists (2 responses)
- ergonomics specialist (1 response)
- housekeeping specialist (1 response)
- structural planner (1 response)
- elevator technician (1 response)
- crane operator (1 response)
- controls planner (1 response)
- communications officer (1 response)
- logistics officer (1 response)
- quality assurance specialist (1 response)
- commissioning consultant for MRI installations (1 response).

Conclusion

Across Canada, multiple professionals are consulted on the replacement or installation of new imaging equipment. DI technologists are the most commonly consulted profession, with representation across all provinces, regions, and sites. These are closely followed by managers and/or directors of imaging departments, medical physicists, and procurement staff. The integration of diverse perspectives when replacing or installing new imaging equipment may play an important role in ensuring more comprehensive and efficient setups, with consideration of broader technical, practical, and patient-centred needs.

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Appendix 1: Survey Questions

DI Equipment Installation Project Team

Please select from the following list the team members you have included in projects when replacing or installing a new MRI, X-ray, or any other DI equipment.

This survey should take 5 minutes to complete.

Thank you for your input.

DI Equipment Installation Project Team:

What is the composition of the team involved in planning, designing, constructing, and installing new imaging equipment? Please tick all that apply:

Manager/Director

Project Manager

Medical Physicist

DI Technologist

PACS Coordinator

IMIT Project Manager

Radiologist

Clerical/Booking Clerk

Procurement Staff

Electrical Planner

Mechanical Planner

Legal Staff

Clinical Engineers (please specify)

Architect

If you have included team members not on this list, please add in the "Other" section and identify their role in the project.

Other (please specify)

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