CADTH

Canadian Medical Imaging Inventory Service Report

Publicly Funded PET-CT Indications: Comparison of Canada With Other Countries

Context

Since the introduction of PET-CT into clinical practice in the late 1990s,[1] it has evolved from a specialized imaging modality available at only a few academic centres to a rapidly adopted technology in many countries.[2,3] Indeed, Canada experienced a 43% increase in the number of PET-CT units over a 10-year period from 2010 to 2019/20, and the growth rate is higher in other countries such as Denmark, the US, the Netherlands, and Japan.[3]

PET-CT has become one of the main diagnostic tests for the investigation of cancer and, depending on the type of cancer, can play a role in diagnosing, grading, staging, biopsy guidance, monitoring response to therapy, restaging for recurrence, and prognosis.[4] In many instances, PET-CT can perform these tasks earlier and more precisely compared with other techniques.[5] As well, there are cost savings associated with using PET-CT in cancer management through the avoidance of the costs and morbidity of unnecessary or potentially ineffective interventions, such as invasive surgery and radiation therapy.[6] PET-CT is also used for the assessment of some non-oncological conditions in the clinical fields of cardiology, neurology, and infectious disease.[7]

Most publicly funded PET-CT referrals are ordered by specialists rather than primary care physicians. In the UK,[8] Australia,[9] and Scotland,[10] PET-CT exam-ordering privileges are limited exclusively to specialists. This practice is the same in Canada, with the exception of 2 provinces that grant these privileges to family physicians and general practitioners.[3]

Each of these countries have approved indications for PET-CT. In Canada, 80% of all PET-CT use is for oncology exams[3] and similar usage patterns are likely based on the recorded uses of PET-CT in countries with similar publicly funded health care systems, such as Australia,[11] Scotland,[10] and the UK.[12]

Objective

This document summarizes the information on publicly funded indications for PET-CT. The key objective is to compare current publicly approved indications for PET-CT in Canada with those from Australia, Scotland, and the UK.

About this Document

This document summarizes information identified mainly through government websites. The Canadian data are based on recommendations from an evidence report published by the Institut national d'excellence en santé et en services sociaux (INESSS)[13] in 2017. CADTH is currently updating provincial publicly funded indications that were last reported in 2015.[14]

Results

Comparison of Publicly Funded PET-CT Indications

The primary use for publicly funded PET-CT is oncology. Overall, there is significant overlap between countries on publicly funded cancer indications. The approval for specific cancer indications may differ from country-to-country based on specific clinical and treatment scenarios and whether PET-CT is indicated for diagnosis, staging, therapeutic guidance, response to treatment, restaging, or follow-up. This level of detail is not reported here due to variability in the granularity of reporting from country-to-country.

In oncology, all countries assessed in in this report publicly fund PET-CT — albeit with some variations in coverage — for the following cancers: lymphoma, head and neck, solitary pulmonary nodule, colorectal, esophageal, cervical, breast, melanoma, brain, pancreatic neuroendocrine, and sarcoma. All countries, with the exception of Australia, fund the following cancers: multiple myelomas, stomach, gastrointestinal stromal, pancreatic, thyroid, liver, kidney, bladder, prostate, penile, testicular, and occult.

PET-CT is also used for other indications, particularly for the diagnosis of cardiac, neurological, and infectious or inflammatory conditions. Australia does not fund PET-CT for any non-oncologic indication other than seizures. All other countries publicly fund PET-CT for the following cardiac indications: cardiac sarcoidosis and large vessel vasculitis. Similarly, for neurology, all countries fund exams for seizures. Table 1 provides detailed information on the publicly funded indications for PET-CT exams in each country.

Table 1: Summary of the Indications Publicly Funded PET-CT Exams for Australia, Canada (Quebec), Scotland, and the UK

Indication	Australia (2020)[11]	Canada (INESSS)[a] (2017)[13]	Scotland (2020)[10]	UK (2020)[12]
Oncology				
Lymphoma	Yes	Yes	Yes	Yes
Multiple myeloma	No	Yes	Exception	Yes
Brain tumours	Yes	Yes	Exception	Yes
Head and neck	Yes	Yes	Yes	Yes
Lung	Yes	Yes	Yes	Yes
Solitary pulmonary nodule	Yes	Yes	Yes	Yes
Pleural malignancy	No	No	Exception	Yes
Thymic	No	No	Exception	Yes
Colorectal	Yes	Yes	Yes	Yes
Stomach	No	Yes	Exception	Yes
Esophageal	Yes	Yes	Yes	Yes

Indication	Australia (2020)[11]	Canada (INESSS)[a] (2017)[13]	Scotland (2020)[10]	UK (2020)[12]
Gastrointestinal stromal	No	Yes	Exception	Yes
Pancreatic	No	Yes	Exception	Yes
Pancreatic neuroendocrine	Yes	Yes	Exception	Yes
Thyroid	No	Yes	Yes	Yes
Liver	No	No	Exception	Yes
Kidney	No	Yes	Exception	Yes
Bladder	No	Yes	Exception	Yes
Cervical	Yes	Yes	Yes	Yes
Endometrial	No	Yes	No	Yes
Ovarian	Yes	Yes	No	Yes
Breast	Yes	Yes	Yes	Yes
Prostate	No	Yes	Exception	Yes
Penile	No	Yes	Exception	Yes
Anal canal	No	No	Exception	Yes
Testicular	No	Yes	Exception	Yes
Melanoma	Yes	Yes	Yes	Yes
Musculoskeletal	No	No	Exception	Yes
Sarcomas	Yes	Yes	Exception	Yes
Unknown primary/occult	No	Yes	Exception	Yes
Paraneoplastic neurological syndromes	No	No	Exception	Yes
Cardiology				
Myocardial viability	No	Yes	Exception	No
Myocardial perfusion	No	Yes	Exception	No
Sarcoidosis	No	Yes	Exception	Yes
Large vessel vasculitis	No	Yes	Yes	Yes
Other	No	Yes	No	No
Neurology				
Refractory seizure	Yes	Yes	Yes	Yes
Dementia/neurocognitive disorder	No	Yes	No	Yes
Infectious and inflammatory diseases				
General	No	Yes	Exception	Yes
Other				
Lymphadenopathy	No	No	No	No
Pyrexia	No	No	Exception	Yes

Note: yes = funded in specific clinical scenarios; no = not funded; exception = considered only in exceptional cases;
[a] = recommendations

Most of the approved oncologic indications recommended by INESSS (Quebec, Canada) in 2017[13] align with those published in the 2015 CADTH report that compared practices across all Canadian jurisdictions.[14] This suggests that the INESSS response used for comparison in this report is a reasonable proxy for overall Canadian practice until 2017. New indications reported by INESSS include stomach cancer and gastrointestinal stromal tumours. The situation is different for non-oncologic indications, for which there is limited alignment.

Of note, a recent systematic review of PET-CT indications published in 2019 suggested restricting its use for brain cancer, head and neck cancer, and colorectal cancer, which are approved indications in all countries used for this comparison.[2]

Conclusion

The most common application of PET-CT is in oncology. Eleven different types of cancer are funded across all countries. Australia has the most restrictive funding policy regarding the range of oncology indications that are funded, followed by Canada. PET-CT is also used, to a lesser extent, for cardiac, neurological, and infection imaging. Canada has the broadest coverage of these indications, particularly in cardiology.

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