Positron Emission Tomography-Computed Tomography for Rheumatology Indications: Diagnostic Accuracy, Clinical Utility, Cost-Effectiveness, and Evidence-Based Guidelines
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Acknowledgments:

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada’s health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.
Research Questions
1. What is the diagnostic test accuracy of positron emission tomography-computed tomography (PET-CT) in patients with Giant Cell Arteritis (GCA) or Takayasu’s vasculitis?
2. What is the clinical utility of positron emission tomography-computed tomography (PET-CT) in patients with Giant Cell Arteritis (GCA) or Takayasu’s vasculitis?
3. What is the cost-effectiveness of positron emission tomography-computed tomography (PET-CT) in patients with Giant Cell Arteritis or Takayasu’s vasculitis?
4. What are the evidence-based guidelines associated with the use of positron-emission tomography-computed tomography (PET-CT) in patients with Giant Cell Arteritis (CGA) or Takayasu’s vasculitis?

Key Findings
Four non-randomized studies were identified regarding fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) for patients with Giant Cell Arteritis (GCA). No evidence was identified for Takayasu’s vasculitis. No economic evaluations or evidence-based guidelines were identified.

Methods
A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit retrieval by publication type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2013 and October 23, 2018. Internet links were provided, where available.

Selection Criteria
One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.
Table 1: Selection Criteria

<table>
<thead>
<tr>
<th>Population</th>
<th>Patients with Giant Cell Arteritis (GCA) or Takayasu’s vasculitis</th>
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<tbody>
<tr>
<td>Intervention</td>
<td>Fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT)</td>
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<tr>
<td>Comparators</td>
<td>Q1-Q3: Alternative diagnostic modalities (e.g., but not limited to, single photon emission computed tomography [SPECT], magnetic resonance imaging [MRI]; Doppler ultrasound); temporal artery biopsy)</td>
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<td>Q4: No comparator</td>
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<td>Outcomes</td>
<td>Q1: Diagnostic accuracy</td>
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<td>Q2: Clinical Utility</td>
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<td>Q3: Cost-effectiveness</td>
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<tr>
<td>Study Designs</td>
<td>Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines</td>
</tr>
</tbody>
</table>

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

Four non-randomized studies were identified regarding fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) for patients with Giant Cell Arteritis (GCA). No relevant health technology assessments, systematic reviews, meta-analyses, economic evaluations, or evidence-based guidelines were identified, nor was any evidence on Takayasu’s vasculitis.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Four non-randomized studies¹-⁴ were identified regarding fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) for patients with Giant Cell Arteritis (GCA).

No abstract was obtained for the study by Sammel et al.;¹ therefore, no summary can be provided.

The second non-randomized study² reported on the performance of FDG PET-CT and CT angiography for the detection large-vessel involvement for patients with GCA. The study included 28 patients, of which 19 had large-vessel involvement and 18 of these patients had similar results (large-vessel involvement) through CT angiography. Both FDG PET-CT and CT angiography had similar detection rates for large-vessel involvement; however, FDG PET-CT had higher performance in per-segment analysis of aortitis, particularly in the aortic branches.¹

The third non-randomized study³ investigated the detection rate of aortitis in GCA patients by comparing FDG PET-CT with CT angiography. Seventy-nine patients were included in the study, with 52 of these patients diagnosed with GCA and 27 patients acting as controls. Patients with GCA received a FDG PET CT scan accompanied by a CT angiography.
Overall, researchers observed that both types of diagnostic tools had relatively similar sensitivity pertaining to aortitis in GCA patients.\(^3\)

The fourth non-randomized study\(^4\) also investigated the diagnostic accuracy of FDG PET-CT scan compared to CT angiography for GCA, after which the patients had their diagnoses confirmed with a temporal artery biopsy (TAB). The study included 24 patients suspected of having GCA. The researchers concluded that both diagnostic tests had high sensitivity, with FDG PET-CT being potentially superior toward CT angiography for the diagnosis of CGA.\(^4\)

**References Summarized**

**Health Technology Assessments**

No literature identified.

**Systematic Reviews and Meta-analyses**

No literature identified.

**Randomized Controlled Trials**

No literature identified.

**Non-Randomized Studies**


**Economic Evaluations**

No literature identified.

**Guidelines and Recommendations**

No literature identified.
Appendix — Further Information

Non-Randomized Studies - No Comparator


**Review Articles**


