Cancer Care Ontario
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Developing a Capacity Planning Model for Positron Emission Tomography Scans in Ontario

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Objectives

Cancer Care Ontario (CCO) has a mandate from the Ministry of Health to plan for Positron Emission Tomography (PET) services in Ontario. The objective of this project is to develop a capacity planning model to make recommendations to the Ministry of Health for the location of future permanent PET sites in the province.

Approach

A model was developed to evaluate the operational viability of potential PET sites to provide timely, evidence-based care administered as close to home as possible while ensuring quality standards are met and that services are economically viable.

We estimated the demand from historical data, comparing it to established thresholds for capacity and quality assurance considerations. Using existing case costing data, we estimated the volume threshold for economic viability. The model was applied to emerging sites based on current areas of need and interest (Sudbury, Kingston and Barrie) and allowed us to examine the volume/cost impact to existing sites as a result of the referral shifts.

We also examined the potential system costs saved by placing a site in Sudbury for patients who travel down from the North East Local Health Integration Network (NE LHIN). There is a potential for cost savings for the Ministry of Health as northern patients can claim the Northern Ontario Travel grant to access services that are greater than 100km away from their place of residence.

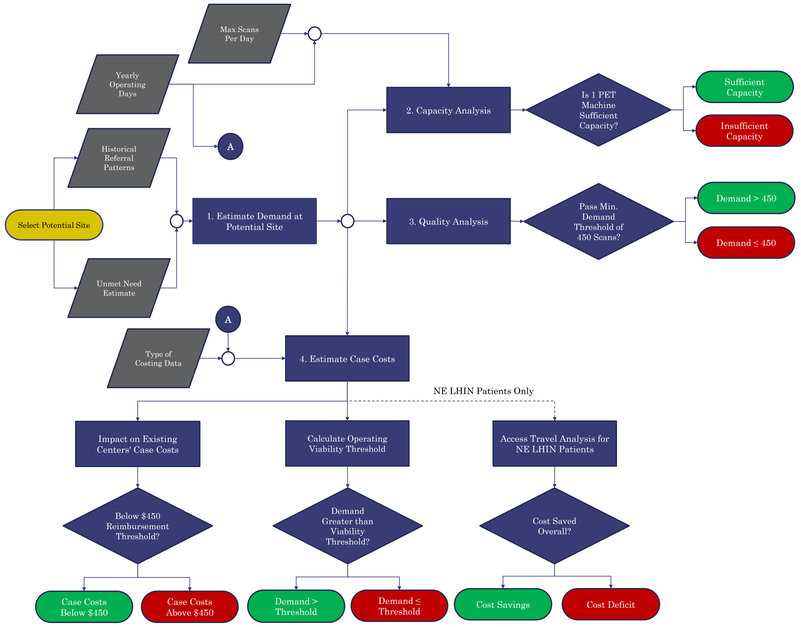
Summary Table of Results

This table shows data assuming that the new sites will operate at 150 scan days per year. The colored boxes indicate whether the site passed the respective threshold.

	Sudbury	Kingston	Barrie
Estimated Demand	561	464	403
Median Travel Distance	412 km	199 km	131 km
Is there Sufficient Capacity on 1 machine?	Yes	Yes	Yes
Pass Quality Volume Threshold?	Yes	Yes	No
Are Existing Sites Below $450 Threshold?	Yes	Yes	Yes
Pass Viability Volume Threshold?	No	No	No
Overall Savings from NE LHIN Travel?	No	N/A	N/A

Capacity Planning Model Flowchart and Assumptions

This flowchart shows the high-level framework for the capacity planning model:



The main assumptions made in the model include:

1) Historical referral patterns were used to repatriate patients to the newly placed sites, with approximately 10% of patients not repatriated due to preference or same day oncology visits in an existing site.

2) 50-150 operating days per year were assumed. The capacity at a site was based on a maximum of 15 scans per day for 50-150 operating days per year, which is a capacity of 750-2250 scans per year.

3) Median provincial costs were used to estimate case costs, except in cases where more information was available. The current reimbursement for PET scans in Ontario is $450 for operating costs and full reimbursement for FDG costs.

4) To maintain the expertise of the physicians at the new site, it was estimated that at the minimum 450 scans per year were required based on quality practice guidelines from the Society of Nuclear Medicine.

5) Human resource costs are accounted for on an hourly basis and reflect the number of days a week the PET program will be available. FTE requirements for each human resource are listed below as a function of scans per day:

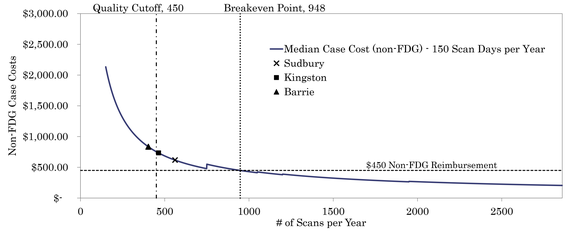
Scans per day	MRT	Clerical	RSO
1-4	1	1	0.2
5-6	2	1	0.2
7	2.25	1	0.2
8-12	2.25	1	0.4
13-15	2.5	1	0.4

MRT: Medical Radiation Technologist
RSO: Radiation Safety Officer

Results

Our analysis indicates that the volume of scans seen at a potential PET site needs to be between **700-1000 scans per year to be financially and operationally viable** (based on 50-150 operating days per year), using case costing information from existing sites and the current reimbursement scheme from the Ministry of Health.

Results - Operating Viability Analysis



Conclusion

None of the sites considered would be able to sustain a PET center at their location due to insufficient demand. Sudbury's current demand makes it the most likely candidate in the province for a permanent PET site as it is likely to exceed the threshold in a few years.

Considerations and Future Work

- The viability threshold is limited to economic considerations. We recognize that long travel times negatively affect a patient's experience and may result in some forgoing their appropriate care.
- This analysis considers only direct operating costs associated with a new PET centre, as that is the scope of the current funding model for PET. Each individual site must conduct their own analysis to see if the capital and indirect costs can be handled by other revenue streams.
- This model only considers the current state of PET scanning in Ontario when assessing potential sites. An extension of this model would include forecasts of demand and capacity for PET scanning and can be used to proactively make a recommendation for the timing and placement of a new PET scanning machine.
- Further work needs to be done to assess whether a mobile PET unit may be a feasible alternative to fixed PET sites.

Acknowledgements

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