

# PET SCANNING

IN WESTERN NEW YORK

2003



**Niagara Health Quality Coalition**

*Improving Quality Through Cooperation*

Prepared for NHQC by

Finger Lakes Health Systems Agency  
1150 University Avenue  
Rochester, NY 14607  
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## **PET Scanning In Western New York 2003**

This report provides information on the availability and utilization of PET scanners in Western New York<sup>1</sup>. It is based on survey data provided by the current providers of PET scans in the region and covers periods through November of 2003. This study was commissioned by the Niagara Health Quality Coalition in its role as advisor to area insurers on the adequacy to PET capacity to meet the needs of local enrollees for this service and was conducted by the Finger Lakes Health Systems Agency.

### **Background**

Positron Emission Tomography (PET) is an imaging technology that can reveal both anatomic and physiologic information in various tissue sites. The physiologic information is what distinguishes it from MRI and CT imaging which provide primarily anatomic information. PET uses radiotracers composed of organic compounds (such as glucose or ammonia) labeled with positron-emitting isotopes. These radiotracers can be metabolized in ways which signal disease processes; an example is cancer cells having a higher rate of glucose metabolism, which can be captured as a “hot spot” in the scanned image.

While PET has been around for twenty years or more, it was primarily limited for much of that time to assessing brain function, such as seizures. In 1995 the federal Medicare program approved payment for studies of cardiac perfusion. Beginning in 1999, however, the Health Care Financing Administration approved reimbursement for a number of new clinical indications, all but one having to do with cancers.

The attached chart describes the PET clinical uses currently approved for federal reimbursement.

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<sup>1</sup>Includes the New York State counties of Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, and Wyoming.

## Medicare PET Coverage Indications

Clinical Condition	Effective Date	Coverage
Solitary Pulmonary Nodules (SPNs)	January 1, 1998	Characterization
Lung Cancer (Non Small Cell)	January 1, 1998	Initial staging
Lung Cancer (Non Small Cell)	July 1, 2001	Diagnosis, staging and restaging
Esophageal Cancer	July 1, 2001	Diagnosis, staging and restaging
Colorectal Cancer	July 1, 1999	Determining location of tumors if rising CEA level suggests recurrence
Colorectal Cancer	July 1, 2001	Diagnosis, staging and restaging
Lymphoma	July 1, 1999	Staging and restaging only when used as an alternative to Gallium scan
Lymphoma	July 1, 2001	Diagnosis, staging and restaging
Melanoma	July 1, 1999	Evaluating recurrence prior to surgery as an alternative to a Gallium scan
Melanoma	July 1, 2001	Diagnosis, staging and restaging; Non-covered for evaluating regional nodes
Breast Cancer	October 1, 2002	As an adjunct to standard imaging modalities for staging patients with distant metastasis or restaging patients with locoregional recurrence or metastasis; as an adjunct to standard imaging modalities for monitoring tumor response to treatment for women with locally advanced and metastatic breast cancer when a change in therapy is anticipated.
Head and Neck Cancers (excluding CNS and thyroid)	July 1, 2001	Diagnosis, staging and restaging
Myocardial Viability	July 1, 2001 to September 30, 2002	Covered only following inconclusive SPECT
Myocardial Viability	October 1, 2001	Primary or initial diagnosis, or following an inconclusive SPECT prior to revascularization. SPECT may not be used following an inconclusive PET scan
Thyroid Cancer	October 1, 2003	Restaging of recurrent or residual thyroid cancers of follicular cell origin that have been previously treated by thyroidectomy and radioiodine ablation and have a serum thyroglobulin >10ng/ml and negative I-131 whole body scan performed.
Refractory Seizures	July 1, 2001	Covered for pre-surgical evaluation only
Perfusion of the heart using Rubidium 82* tracer	March 14, 1995	Covered for noninvasive imaging of the perfusion of the heart.
Perfusion of the heart using ammonia-13* tracer.	October 1, 2003	Covered for noninvasive imaging of the perfusion of the heart

\*Not FDG-PET.

## Inventory of PET Services

There were PET scanners in the Buffalo area as early as 1991, with two additional units added in the mid-1990s and two more since the changes in federal reimbursement; an additional unit is anticipated to begin operations in the first quarter of 2004.

There are currently six PET delivery sites in the region. Five of the sites are in Buffalo, while the sixth is in Niagara Falls. Five of the six are stationary units, while the sixth is a mobile unit. There is also equipment located at Medina Memorial Hospital (a gamma camera with coincident detection capabilities) which can perform PET-like studies. It should also be noted that there is a PET unit reported in Erie Pa. which probably serves some patients from the WNY region.

Table 1

### Inventory of PET Machines in Western New York December, 2003

<u>Site</u>	<u>Units</u>	<u>Mobile/Fixed</u>	<u>Hospital Based?</u>	<u>Ownership</u>
Buffalo Cardiology	1.0	F	N	Physician
Millard Fillmore Gates Circle/ Dent Neurologic	1.0	F	Y	Physician
Niagara Falls Mem Hosp/ Merighe	1.0	F	Y	Physician
Mercy Hospital/ Southtown Radiology	0.2	M	Y	Alliance Imaging
University Nuclear Med-Williamsville	1.0	F	N	Physician
Buffalo VA/University Nuclear Medicine	1.0	F	Y	Physician
Medina Memorial Hospital	(1.0)*	F	Y	Hospital

\*Unit is available full-time, but is used in its PET-like modality infrequently.

Table 2

**PET Equipment**

<u>Site</u>	<u>Manufacturer</u>	<u>Type*</u>	<u>Radiopharmaceutical Vendor</u> (Distance from Site)
Buffalo Cardiology (service initiated in 1995)	Positron	P	Bracco Diagnostics and Central Radiopharmaceutical Services (2 mi)
Millard Fillmore Gates Circle/ Dent Neurologic (service initiated in 1994)	Siemens	P	Central Radiopharmaceutical Services (10 mi)
Niagara Falls Mem Hosp/ Merighe (service initiated 07/03)	Positron	P	Bracco Diagnostics (20-30 minutes)
Mercy Hospital/ Southtown Radiology	Siemens	P	Central Radiopharmaceutical Services (20 mi)
University Nuclear Med-Williamsville (service initiated 02/01)	Adack	P	Central Radiopharmaceutical Services (6 mi)
Buffalo VA/University Nuclear Medicine (service initiated 07/91)	Siemens	P	Central Radiopharmaceutical Services (<1 mi)
Medina Memorial Hospital		MCD	Pharmologics (200 mi)

\*MCD – Molecular Coincidence Detection

P – PET only

C – Combined PET and CT

Changes in Equipment

Dent Neurologic was reported to have a unit in Williamsville, but that unit apparently is closed. Roswell Park Cancer Institute indicates it will install a unit in the first quarter of 2004. One provider reported there is a unit on order to replace the unit at the Buffalo VA, the region's oldest machine. There are applications to expand utilization at the unit in Niagara Falls, and to add a PET/CT, a related service, in Williamsville.

**Availability and Accessibility**

Table 3 describes by respondent the number of days each scanner is staffed and the hours of operation per day. This provides one measure of availability of this service. No service is currently scheduled on a weekend day. The respondents indicate a scan takes 45 to 150 minutes of machine time, with most responses in the 45 to 60 minute range.

Table 4 displays wait times to get emergency or routine scheduling for a PET scan, and generally it suggests good accessibility of current scanners. Nationally in 2002, 12 percent of sites provided routine service in less than one day, another 20 percent within 1 to 2 days; 42 percent of sites reported 5 to 7 day wait for routine service.

Table 3

**PET Service Staffing**

<u>Site</u>	<u>Days/Week</u>	<u>Hours/Day</u>	<u>Estimated Capacity</u> <u>Based on Current Hours/Staff</u> <u>and Time per Scan</u>
Buffalo Cardiology	5	4	4-5/day
Millard Fillmore Gates Circle/ Dent Neurologic	5	8	8/day
Niagara Falls Mem Hosp/ Merighe	5	9	6-7/day
Mercy Hospital/ Southtown Radiology	1	8	10 day
University Nuclear Med-Williamsville	5	11	10-11/day
Buffalo VA/University Nuclear Medicine	5	8	3-4/day
Medina Memorial Hospital	5*	8	

\* Although available, the unit is used in its PET-like capability infrequently

Waiting Time

Table 4

**Waiting Time to Obtain a PET Scan**

<u>Site</u>	<u>Emergency Scan</u>	<u>“Routine” Scan</u>
Buffalo Cardiology	Same day	Same day
Millard Fillmore Gates Circle/ Dent Neurologic	NA	7 days
Niagara Falls Mem Hosp/ Merighe	0-1 day	6-7 days
Mercy Hospital/ Southtown Radiology	NA	within 7 days
University Nuclear Med-Williamsville	1 day	1-2 days
Buffalo VA/University Nuclear Medicine	1 day	2 days
Medina Memorial Hospital	1 day	within 7 days

There are no generally accepted geographic access standards for PET services. The New York State Department of Health uses the multi-county Health Services Areas (HSA) for analysis of access to, and need for, PET services.

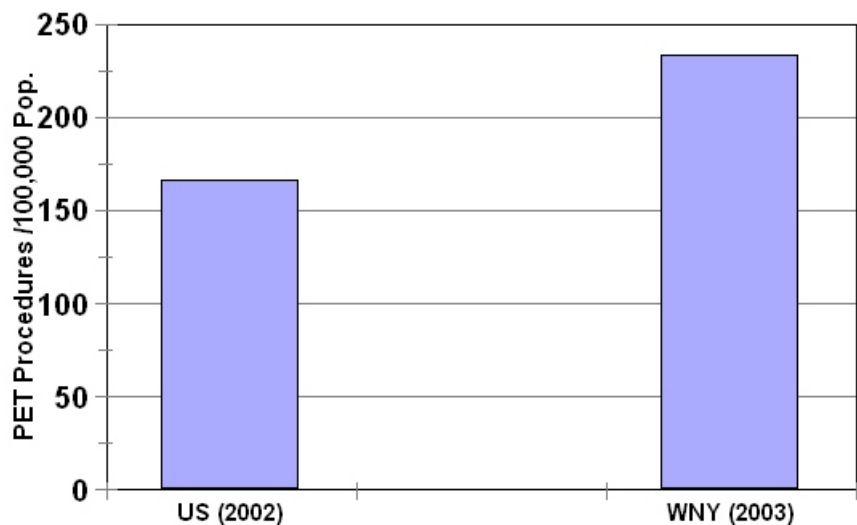
In Erie and Niagara Counties, all residents have access to a PET scanner within approximately a one-half hour drive. Most residents of the Southern Tier are more distant than one-half hour from a PET scanner, as are those living in the western half of Orleans, Genesee and Wyoming counties (other than those accessing the PET-like service at Medina).

Among community hospitals in the region, only Millard Fillmore Gates Circle and Mercy in Erie County, and Niagara Falls Memorial Medical Center in Niagara have on-site access to PET services. Medina Memorial has a nuclear medicine camera with coincident detection capabilities. Among specialty hospitals, the VA Medical Center has a PET service, and Roswell Park is slated to begin PET service in first quarter 2004; none of the area's three mental hygiene facilities, nor the VA medical center in Batavia, have on-site access to PET. Note, however, that nationally in 2002, inpatients represent only 6 percent of PET service volume<sup>2</sup>.

### Utilization

PET scanners in Western New York were used to provide approximately 2,785 scans in 2003, although they were providing scans to approximately 310 patients per month at the end of the year (an annualized rate of 3,750 scans/year). This suggests a current PET scan rate of 233 scans per 100,000 population. As seen in this graph, that rate is approximately one-third higher than the national average as determined by IMV Medical Information.<sup>2</sup>

### 2003 PET Utilization Western NY and U.S.

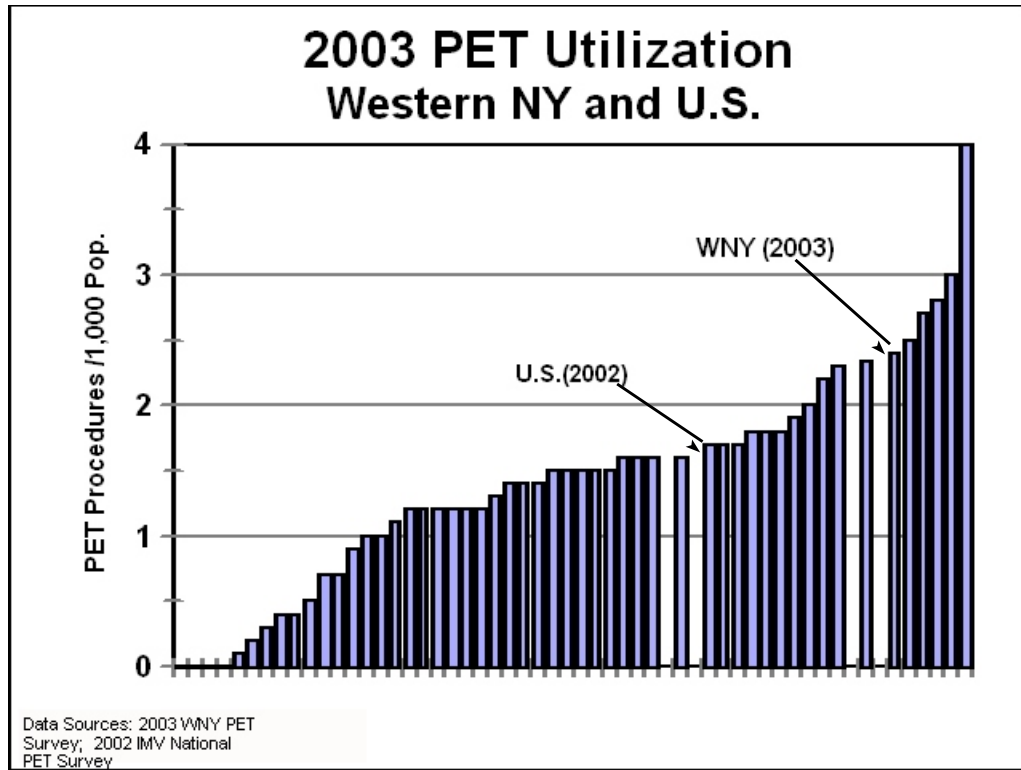


Data Sources: FLHSA 2003 PET Survey;  
2002 IMV National PET Survey

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<sup>2</sup>IMV Medical Information Division, "2002 PET Benchmark Report", IMV (Des Plaines, Ill), 2003.

If Western New York were a state, and arrayed against all other states in the U.S., there would only be six states with a higher use rate.

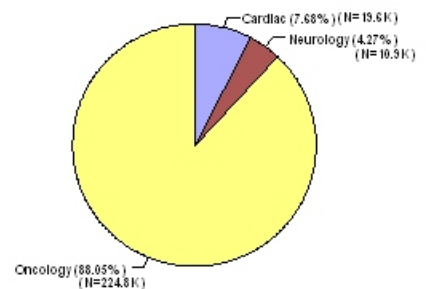


In comparing local use to national, it is important to note that the figures are from two different years. With new indications, PET utilization is increasing rapidly; U.S. utilization increased by 79 percent from 2001 to 2002. While the national average use rate probably did not increase by that same percentage in 2003, if it only increased by 40 percent from 2002 to 2003, it would be equal to the observed WNY rate.

Anatomic Site

The respondents were not asked for data on which anatomic sites/clinical indications generate requests for PET imaging. One site which provides about one-third of local scans, however, indicated it was currently doing mostly cardiac studies. As seen in this graph, that presents a different use pattern than seen elsewhere; nationally, only 4 percent of scans are used for cardiac studies, while most scans are performed for oncology indications. The local pattern of use probably is the result of the local availability of the specialized radiopharmaceuticals used for cardiac PET scans.

**AVG. ANN. CLINICAL PET PROCEDURE/SITE U.S., BY SITE TYPE, 2001**



Data Source: IMV

## Community Need

For this report, an estimate of medical need for PET scans has been generated using the following inputs:

- The new indications for PET scans;
- Estimates from the medical literature of the proportion of patients of each disease state (e.g, lung cancer patients) needing PET scans;
- Updated information on numbers of new cancers by site and an estimate of heart disease incidence; and,
- Population counts of the WNY counties.

From those inputs, calculations of need were developed for the residents of each county. These estimates were then distributed to locations (Buffalo, Southern Tier, etc.) based on hospitalization patterns; while this distribution may not be fully accurate for this primarily outpatient service, it is likely a good proxy for patient care-seeking patterns, given the high tech nature of PET services.

Based on those data, the following “need” for PET scans by area is calculated:

<u>Location<sup>3</sup></u>	<u>Scans per Year</u>
Erie	2, 100 to 2,800
Niagara	275 to 360
“Eastern” Counties (Orleans, Genesee, and Wyoming)	165 to 215
Southern Tier Counties (Allegany, Chatauqua, and Cattaraugus)	450 to 600

Erie County PET sites are currently providing 2,185 scans per year, close to the number suggested as needed. The provider in Niagara County is generating nearly 1,300 scans per year, well above the suggested need. There currently are no PET providers in the Eastern or Southern Tier counties, except the PET-like service at Medina Memorial Hospital (which only provides 1-2 scans per month).

The clinical indications for PET scanning are likely to continue to expand. Evidence to support reimbursement is still being sought for indications in brain tumors, pancreatic and ovarian cancers, and musculoskeletal systems, and early diagnosis of Alzheimers Disease is a possible future use which would have significant implications for demand for this service.

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<sup>3</sup>This is the location of the provider, but patients may come from outside of the county in which the provider is located. For instance, the Buffalo-based PET units may provide services to some residents of Genesee County, and that would be reflected in the number of scans demanded in Erie; hospitals in Genesee may also provide services to Genesee residents, and that demand would be reflected in the estimate for the “Eastern” provider location.

### Scans Per Machine

Many of the providers have indicated it takes about one hour of machine time to perform a PET scan, suggesting a capacity of 8 patients per 8 hour day. Thus, 5 days per week/260 days per year of service can provide 2080 scans per year if fully scheduled. At 90 percent scheduling efficiency, a scanner would provide 1875 scans per year. Presumably, additional scans could be performed if operating hours were extended, and access could be improved if units were used on some evening or weekend hours.

The providers current schedule and staffing suggest a present capacity to generate 165 scans per week or over 8,500 scans per year. Recall that regional use is presently about 3,750 scans per year.

### Community Need Conclusion

The above analysis suggests that WNY currently is demanding/using about the right number of PET scans, but doing so on many more units than needed.

If scanners were efficiently used, there would be “need” region-wide for about 2 scanners instead of the present 5.2 full-time equivalent PET units operating (6.2 units early next year).

Allowing for rapid growth in PET indications, perhaps two machines are presently justified in Erie County, a fraction of one in Niagara, and a fraction of one in the Southern Tier. Stated another way, the current use rate would need to increase by 50 percent per year for 3 years before serious strain would be observed on the current WNY PET capacity.

It appears that there is not a need to add additional capacity to the area at this time.

For Additional Copies Contact

Bruce A. Boissonnault, President  
**Niagara Health Quality Coalition**

665 Main Street  
Suite 200  
Buffalo, New York 14203

Phone (716) 852-7100  
Fax (716) 852-2761  
[www.myHealthFinder.com](http://www.myHealthFinder.com)