Hartford HealthCare

October 14, 2014

Kimberly Martone
Director of Operations
Office of Health Care Access
Division of the Department of Public Health
410 Capital Avenue, MS#13HCA
Hartford, CT 06106

Re: Harford Hospital
Certificate of Need Application: Termination of Nuclear Cardiology Services at Hartford Hospital Provider-Based Satellite Locations

Dear Ms. Martone:

Enclosed please find a Certificate of Need Application for the Termination of Nuclear Cardiology Services at Hartford Hospital Provider-Based Satellite Locations. As requested, I have included 1 original and 4 hard copies of our application each placed in a 3-Ring binder and two disks, one containing the application in its entirety in .pdf format, the other containing the documents in MS Word and MS Excel as appropriate.

Please do not hesitate to contact me at 860-972-4231 if you have any questions. Thank you for your time and consideration. I look forward to working with you on this very important proposal.

Sincerely,

Barbara A. Durdy
Director, Strategic Planning
Hartford HealthCare

Enclosures

One State Street Suite 19 Hartford, CT 06103 tel 860.263.4100 fax 860.263.4115 www.hartfordhealthcare.org

Application Checklist

Instructions:

1. **Please check each box below, as appropriate; and**
2. **The completed checklist *must* be submitted as the first page of the CON application.**

X **Attached is the CON application filing fee in the form of a certified, cashier or business check made out to the "Treasurer State of Connecticut" in the amount of $500.**

For OHCA Use Only:

Docket No.: _____ **Check No.:** 49797
OHCA Verified by: _____ **Date:** 10/15/19

X **Attached is evidence demonstrating that public notice has been published in a suitable newspaper that relates to the location of the proposal, 3 days in a row, at least 20 days prior to the submission of the CON application to OHCA. (*OHCA requests that the Applicant fax a courtesy copy to OHCA (860) 418-7053, at the time of the publication)***

X **Attached is a paginated hard copy of the CON application including a completed affidavit, signed and notarized by the appropriate individuals.**

X **Attached are completed Financial Attachments I and II.**

X **Submission includes one (1) original and four (4) hard copies with each set placed in 3-ring binders.**

Note: **A CON application may be filed with OHCA electronically through email, if the total number of pages submitted is 50 pages or less. In this case, the CON Application must be emailed to the following email addresses: steven.lazarus@ct.gov and leslie.greer@ct.gov.**

Important: **For CON applications(less than 50 pages) filed electronically through email, the signed affidavit and the check in the amount of $500 must be delivered to OHCA in hardcopy.**

X ☐ **The following have been submitted on a CD**

1. **A scanned copy of each submission in its entirety, including all attachments in Adobe (.pdf) format.**
2. **An electronic copy of the documents in MS Word and MS Excel as appropriate.**

Stuff

Wanted To Buy

BUYING ANTIQUES & OLD STUFF Jewelry Watches Bottles Pottery Stoneware Toys Games Bicycles Military Fishing Hunting Archery & many other items 860-874-8396

BUYING MACHINIST TOOLBOXES Tools & tooling, contents of machine shops, carbide inserts and mechanic tools. Call anytime 860-985-5760

BUYING OLD MAHJONG SETS Incompl. sets okay. Greater Hrtfd. 860-231-8466

CITY RECYCLING
Will buy your scrap steel, copper, aluminum, cars and trucks. 30 Fishfry St., Hartford. Call 860-522-9273

Announcements

Lost/Found

REWARD
Lost two very sentimental matching rings while visiting Hartford, West Hartford area. Easily identifiable. Substantial reward for return. 860-836-7656

Real Estate

Rentals

BRISTOL 1 & 2 BR. Spacious layouts. Several locations. Renovated. On-site laundry $575 & up 860-584-1654www.Harvest-Properties.com

EAST GRANBY 1 & 2 BR apartments available. Call 677-1381

EAST WINDSOR Enormous Eff. Clean & quiet. Secure Bld. Appliances, carpet & private balcony. On-site laundry. Heat & H.Wtr Inc. $625 & up. 860-875-9500

HARTFORD Studio $550, 1BR $685, 2BR $850. Well-kept, elev building. ht/hw included, parking available. No Pets. 860-549-3181

MANCHESTER Affordable large 1 bd condo, h/hw incl. $975+security & references. Call Ken 860-647-1442

MIDDLETOWN- HIGHVIEW APTS Huge 1&2 BR. Fully appl.eat in kitchen. Large liv.room w/ balcony. Laundry, prkg. Free H&HW. $895/$925 860-704-0102

NEW BRITAIN 860-223-8866
Evergreen Townhouse Apartments
Remodeled 2 & 3 Bedroom Townhomes in quiet area. Private entry, hardwood floors. Laundry. On bus line. Heat & Hot Water included.
$840+ 2 bd/ $940+ 3 bd.
www.Harvest-Properties.com

SIMSBURY 1 & 2 BR apts, Twnhses, flats, some w/ garages. Call 860-677-1381

WEST HARTFORD Clean, sunny, remod. 1 & 2 bd, quiet area. Appls, w/w, lndry. on busline, great schools, community rm. FREE HT/HW $680/$960 and up. www.Harvest-Properties.com 953-9030 EOH

WETHERSFIELD 1400-2500sfspace avail. Silas Deane. $13gr. 860-529-5158

WINDSOR LOCKS Beautiful Spacious 1&2, quiet building, W/W, appls, onsite laundry, c/air, elevator, busline. Free Heat/HW. $750-$850 and up. 860-875-9500 EOH www.Harvest-Properties.com

Commercial / Industrial Rent

BROAD BROOK Recently renovated 1st floor apt in 2011 2bd/ 1ba. $925/month contact 413-233-6061 brent.skrzypek@yahoo.com

PUBLIC NOTICES

Hartford

Public Notice Filing for Hartford Hospital Termination of Nuclear Imaging Service

Statutory Reference: Connecticut General Statutes §19a-638(a)
Applicant: Hartford Hospital

Proposal:
The Applicant intends to file a Certificate of Need application with the State of Connecticut Office of Health Care Access to terminate its provision of nuclear imaging services at the following locations:

100 Simsbury Road, Avon Connecticut
100 Retreat Avenue, Harford Connecticut
703 Hebron Avenue, Glastonbury, Connecticut
65 Memorial Road, West Hartford, Connecticut
11 South Road, Farmington, Connecticut

Capital Expenditure: None

STATE OF CONNECTICUT
SUPERIOR COURT
JUVENILE MATTERS

ORDER OF NOTICE

Notice to Miguel Perez putative father of child born on 5/16/99 to Sophia P. of parts unknown

A petition has been filed seeking:

Commitment of minor child(ren) of the above named or vesting of custody and care of said child(ren) of the above named in a lawful, private agency or a suitable and worthy person.

The petition, whereby the court's decision can affect your parental rights, if any, regarding minor child(ren) will be heard on **10/2/14 at 9:30 AM** at Hartford Superior Court, Juvenile Matter, **920 Broad Street, Hartford, CT 06106.**

Hearing on an Order of Temporary Custody will be heard on: **8/29/14 at 11:15 AM at 920 Broad Street, Hartford, CT 06106.**

Therefore, ORDERED, that notice of the hearing of this petition be given by publishing this Order of Notice once, immediately upon receipt, in **Hartford Courant** a newspaper having circulation in the town/city of: **Hartford, CT.**

Hon: Jason Lobo - Judge
P. Roman - Clerk
Signed: 8/22/14

Right to Counsel: Upon proof of inability to pay for a lawyer, the court will make sure an attorney is provided to you by the Chief Public Defender. Request for an attorney should be made immediately in person, by mail, or by fax at the court office where your hearing is to be held.

LEGAL NOTICE
CONNECTICUT LOTTERY CORPORATION
NOTICE OF END OF INSTANT GAME

The Connecticut Lottery Corporation hereby gives notice that sales of the scratch game "Max-A-Millions" (Game #871) ended on 8/22/14.
All winning tickets, including top prizes, for this game must be validated no later than 08/22/15.
The Official Procedures for All Scratch Games apply to this game. Those Official Procedures, as well as end of game and unclaimed prize information, are available at ctlottery.org and from CT Lottery Games Dept., 777 Brook St., Rocky Hill, CT 06067.

State of Connecticut
Department of Administrative Services
INVITATION TO SUBMIT LEASE PROPOSAL

The State of Connecticut, Department of Administrative Services, will accept lease proposals/site offerings from property owners or their representative(s) through 3 **p.m. September 11, 2014**, to lease a total of **9,996+/- net usable square feet of warehouse space,** with on-site, reserved, paved and lighted parking for **fifteen (15) cars** in the West Hartford area, for use and occupancy by the **Division of Criminal Justice** for a term of five (5) years, with one (1) or two (2) five (5) year renewal options. Offers from option holders cannot be considered. The premises must be accessible to individuals with disabilities and public transportation. Preference will be given to proponents offering purchase, renewal options and/or termination clauses.

Proposals should be addressed exclusively to:
Department of Administrative Services
State Office Building
165 Capitol Avenue
Hartford, CT 06106

Attention: Leasing and Property Transfer – Room G-1
Solicitation Number: **LP 14-21**
(Two (2) copies should be submitted)

Proposals must be submitted using the State of Connecticut "Proposal to Lease Space" form together with a "Notice of Listing Agreement", if applicable. Lease proposal information and related forms may be obtained using the "Leasing" link at www.ct.gov/das/ or by calling (860) 713-5600. The submission of a proposal shall not bind the State of Connecticut, nor does it constitute a competitive bid. The Department of Administrative Services reserves the right to reject any and all proposals. **Faxed proposals will not be accepted.** If you are awarded the subject lease and the lease has a value of $50,000 or more, you will be required to sign and submit, at the time of lease execution, a certification, certifying that you, your company, and specified other individuals have given no gifts to DAS personnel and other individuals set forth in the Contractor/Consultant Certification. See www.ct.gov/das/, click on Affidavits, click on Contractor/Consultant Certification or see Conn. Gen. Stat. §4-252. For the purposes of signing the Certification, the "date DAS began planning the subject project or services is July 24, 2014. Pursuant to Conn. Gen. Stat. §4-252(d), any bidder, proposer, or person who responded to a request for qualifications for a contract with a value of $50,000 or more who does not make this certification shall be disqualified.

Donald J. DeFronzo Commissioner

Notice of Intent
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One Day Collection
Household H

The Commissioner
Energy and Environ
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p.m. Monday through
Department's website
Copies may also be o
the Department at (860

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The Connecticut Departm
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ct.gov to request an accom

8/20/2014
Date

Macky McCleary
Commissioner

REQUEST FOR

The Town of Wethersfield
on the following

TEST& SEAL STORM DR
STREETS

All bids must be submitted
accordance with specificati
the Town of Wethersfield, P
505 Silas Deane Highwa
CT 06109. Bid Specific
downloaded at http://weth
finance/open-bids.

Bids will be received un
September 10th, 2014
and opened and read publicly

CT1 MEDIA | PUBLISHING DIGITAL

Printed: 8/22/2014 3:26:27 PM

Order ID: 2631326

GROSS PRICE * : **$369.67**

* Agency Commission not included

PACKAGE NAME: Legal Notice FR
Daily

Product(s): Hartford Courant, Affidavits, MyPublicNotices.com

AdSize(s): 1 Column, , 300 x 250 Pixels

Run Date(s): Wednesday, August 27, 2014, Thursday, August 28, 2014, Friday, August 29, 2014

Color Spec. B/W

Preview

Public Notice Filing for Hartford Hospital
Termination of Nuclear Imaging Service

Statutory Reference: Connecticut General Statutes §19a-638(a)
Applicant: Hartford Hospital

Proposal:
The Applicant intends to file a Certificate of Need application with the State of Connecticut Office of Health Care Access to terminate its provision of nuclear imaging services at the following locations:

100 Simsbury Road, Avon Connecticut
100 Retreat Avenue, Harford Connecticut
703 Hebron Avenue, Glastonbury, Connecticut
65 Memorial Road, West Hartford, Connecticut
11 South Road, Farmington, Connecticut

Capital Expenditure: None

00003

AFFIDAVIT

Applicant: **Hartford Hospital**

Project Title: **Termination of Nuclear Cardiology Services at Five Hartford Hospital Provider-Based Satellite Locations**

I, **Stuart Markowitz, Senior Vice President, Harford HealthCare & President, Hartford HealthCare, Hartford Region**
(Individual's Name) (Position Title – CEO or CFO)

of **Hartford Hospital**, being duly sworn, depose and state that
(Hospital or Facility Name)

Hartford Hospital's information submitted in this Certificate of
(Hospital or Facility Name)

Need Application is accurate and correct to the best of my knowledge.

Signature

8/20/14
Date

Subscribed and sworn to before me on 8/20/14

MARTHA SANTILLI
NOTARY PUBLIC OF CONNECTICUT
My Commission Expires 5/31/2019

Notary Public/Commissioner of Superior Court

My commission expires: _____

State of Connecticut
Office of Health Care Access
Certificate of Need Application

Instructions: Please complete all sections of the Certificate of Need ("CON") application. If any section or question is not relevant to your project, a response of "Not Applicable" may be deemed an acceptable answer. If there is more than one applicant, identify the name and all contact information for each applicant. OHCA will assign a Docket Number to the CON application once the application is received by OHCA.

Docket Number:

Applicant: Hartford Hospital

Applicant's Facility ID*:

Contact Person:	Barbara A. Durdy
Contact Person's Title:	Director, Strategic Planning Hartford HealthCare
Contact Person's Address:	181 Patricia Genova Blvd., Newington, CT 06111
Contact Person's Phone Number:	860-972-4231
Contact Person's Fax Number:	860-972-9025
Contact Person's Email Address:	barbara.durdy@hhchealth.org
Project Town:	Avon, Hartford, Glastonbury, West Hartford, Farmington
Project Name:	Termination of Nuclear Cardiology Services at Hartford Hospital Provider-Based Satellite Locations
Statute Reference:	Section C.G.S. §19a-638
Estimated Total Capital Expenditure:	0

*Please provide either the Medicare, Connecticut Department of Social Services (DSS), or National Provider Identifier (NPI) facility identifier.

1. **Project Description: Service Termination**

   a. For each of the Applicant's programs, identify the location, population served, hours of operation, and whether the program is proposed for termination.

   Hartford Hospital (the "Hospital") is an 867 bed teaching hospital. The Hospital provides primary, secondary, and tertiary acute care services to the Greater Hartford region.

   In cooperation with 3 private cardiology physician practices, Harford Hospital currently provides nuclear cardiology imaging services at the following five locations within the Greater Harford region:

   (1) Nuclear Cardiology Avon
   100 Simsbury Road
   Avon, Connecticut 06001

   (2) Nuclear Cardiology Retreat Ave.
   100 Retreat Avenue
   Suite #811
   Hartford, Connecticut 06106

   (3) Nuclear Cardiology Glastonbury
   703 Hebron Avenue
   Glastonbury, CT 06033

   (4) Nuclear Cardiology Blue Back Square
   65 Memorial Road
   West Hartford, CT 06107

   (5) Nuclear Cardiology Farmington
   21 South Road
   Farmington, CT 06032

   These five Hospital provider-based outpatient nuclear cardiology imaging satellite locations operate during regular business hours of Monday through Friday, 8am to 5pm. [Confirm with April; I recall that one site may have operated 4 days a week] The Hospital is proposing to terminate hospital-based outpatient nuclear imaging services at all five of the nuclear cardiology imaging locations listed above because of declining volumes and a desire to better utilize and allocate Hospital resources.

   Assuming that the Hospital receives approval to terminate outpatient nuclear cardiology imaging services at the five locations, the private cardiology practices will continue to provide nuclear imaging services at two of the locations or at other locations operated by the practices. Specifically:

- **Avon: One of the private cardiology practices at the Avon location will continue to provide nuclear cardiology imaging services to the patient population previously served by the Hospital at the Avon location.**

- **Farmington and Retreat Avenue: The same private cardiology practice with practice locations in Farmington and Retreat Avenue will continue to provide nuclear cardiology imaging services at the Farmington location. Patients from the practice's Retreat Avenue location may receive nuclear cardiology imaging services at the Farmington location.**

- **Blue Back Square and Glastonbury: The private practice cardiologists that have practice locations in Blue Back Square and Glastonbury already provides nuclear imaging services at their private practice location in Wethersfield, Connecticut. Although nuclear cardiology imaging services will no longer be provided at Blue Back Square and Glastonbury, private practice patients from these locations may receive nuclear cardiology imaging services at the group's Wethersfield location.**

b. Describe the history of the services proposed for termination, including when they were begun and whether CON authorization was received.

These are Hospital outpatient provider-based services provided in cooperation with three cardiology private practices since 2002. When the services were initiated, there was no requirement for a Certificate of Need.

c. Explain in detail the Applicant's rationale for this termination of services, and the process undertaken by the Applicant in making the decision to terminate.

The termination of Hospital nuclear cardiology imaging services at these 5 provider-based outpatient locations is in response to a steady decline in volume in the past five years. Thus, a decision was made by the Hospital to reallocate its resources by transitioning its nuclear cardiology imaging services to the private cardiologists.

The private cardiology physician practices in Avon and Farmington will purchase SPECT myocardial perfusion imaging cameras upon CON approval and will be providing the service for their patients at these locations. As previously mentioned, one of the private practices currently owns he necessary equipment and will continue to provide the service in their Wethersfield office

d. Did the proposed termination require the vote of the Board of Directors of the Applicant? If so, provide copy of the minutes (excerpted for other unrelated material) for the meeting(s) the proposed termination was discussed and voted on.

Yes, Hartford Hospital's bylaws do require approval of the Board of Directors for this change in services.

Please see Exhibit 1 for the Harford Hospital Board resolution approving the termination of nuclear cardiology services as described in this application.

e. Explain why there is a clear public need for the proposal. Provide evidence that demonstrates this need.

There is clear public need to improve efficient and cost effective care for patients by (1) reducing the number of sites where nuclear cardiology imaging services are provided; (2) consolidating services under a single provider (practice) at each location where nuclear cardiology imaging services will continue and (3) permitting the Hospital, by terminating its role in the service at these locations, to better utilize and allocate its resources. As Table A below illustrates, in the aggregate, patient volumes have decreased by 26% (375 scans) at these five practice locations.

Nuclear Cardiology Patient Volume by Service Location							
		Patient Volumes				FY2011-FY2014	FY2011-FY2014
Physician Practice Site	Practice Address	FY 2011	FY2012	FY 2013	FYTD 2014*	Change	% Change
Nuclear Cardiology Avon	100 Simsbury Road	122	189	164	172	50	41%
Nuclear Cardiology Glastonbury	703 Hebron Ave	337	360	221	204	-133	-39%
Nuclear Cardiology Retreat Ave	100 Retreat Ave	622	643	466	319	-303	-49%
Nuclear Cardiology BlueBack Square	65 Memorial Road	225	235	150	152	-73	-32%
Nuclear Cardiology Farmington	21 South Road	145	160	254	229	84	58%
		1451	1587	1255	1076	-375	-26%
* annualized based on 9 months							

Table A.

Nuclear cardiology volumes have been trending downward nationally over the past several years. The Hospital has experienced a decrease in nuclear imaging volumes consistent with national trends. The decrease in nuclear imaging volume is attributed to a number of factors including application of more precise use criteria for diagnostic testing, insurance company authorization requirements, and availability of alternative testing modalities.

Please see Exhibit 2 for information on national trends in nuclear cardiology.

2. Termination's Impact on Patients and Provider Community

a. Identify the name and location (i.e. address, town and state), facility ID and hours of operation (as available) of existing providers in the towns listed above and in nearby towns.

TABLE 1
EXISTING SERVICE PROVIDERS

Facility Name	Facility ID*	Facility Address	Service	Days/Hours of Operation
1) Harford Hospital Nuclear Cardiology Laboratory	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	80 Seymour Street Hartford, CT 06106	Nuclear Imaging	M-F: 7am-5pm Sat-Sun: 7am-3:30pm
2. Nuclear Cardiology Farmington	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	21 South Road Farmington, CT 06032	Nuclear Imaging	M: 8am-5pm W- 8am-5pm Th: 8am-12noon
3. Nuclear Cardiology Retreat Avenue	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	100 Retreat Avenue Suite #811 Hartford, Connecticut 06106	Nuclear Imaging	M-F: 8am-5pm
4. Nuclear Cardiology Blue Back Square	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	65 Memorial Road West Hartford, CT 06107	Nuclear Imaging	M-Th: 8am-5pm
5. Nuclear Cardiology Glastonbury (Connecticut MultiSpecialty Group)	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	65 Memorial Road West Hartford, CT 06107	Nuclear Imaging	M-Th: 8am-5pm
6. Connecticut MultiSpecialty Group	Physician practice NPI unknown	1260 Silas Deane Hwy Wethersfield, CT	Nuclear Imaging	M-F: 8am-5pm
7. Nuclear Cardiogy Avon	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	100 Simsbury Road Avon, CT 06001	Nuclear Imaging	M: 8am-5pm W- 8am-5pm Th: 8am-12noon

*Please provide either the Medicare, Connecticut Department of Social Services (DSS), or National Provider Identifier (NPI) facility identifier and label column with the identifier used.

Saint Francis Hospital and Medical Center, Hartford, CT and the John Dempsey Hospital-University of Connecticut Health Center, Farmington, CT both have SPECT cameras that

provide nuclear cardiology imaging services. The hours of operation for these services are not publically available. In addition, private cardiology physician practices that are not affiliated with the Hospital may be providing these services within the Greater Hartford region. This information is not publically available.

a. For each provider to whom the Applicant proposes to transfer or refer clients, provide the facility ID, total capacity, current available capacity, as well as the utilization for the last completed year and for the current year.

Patients will not need to be transferred to new providers for their nuclear cardiology imaging services as the three private cardiology practices will continue to provide the nuclear cardiology imaging services independent of the Hospital.

TABLE 2
PROVIDERS ACCEPTING TRANSFERS/REFERRALS

Facility Name	Facility ID*	Facility Address	Total Capacity	Available Capacity	Utilization FY 2013**	Utilization Current FY 2014 ***
1) Harford Hospital Nuclear Cardiology Laboratory	Hartford Hospital National Provider Identification # (NPI) – Outpatient 1770696643	80 Seymour Street Hartford, CT 06106	3,900 15 per day Two nuclear camera systems	1,300 Two nuclear camera systems	2,100 Two nuclear camera systems	1,954 Two nuclear camera systems
2)Cardiology P.C.	Physician practice NPI unknown	21 South Road Farmington, CT 06032	1,560	520	254	229
3) Connecticut MultiSpecialty Group	Physician practice NPI unknown	1260 Silas Deane Hwy Wethersfield, CT	12 per day	unknown	unknown	unknown
4) Consulting Cardiology	Physician practice NPI unknown	100 Simsbury Road Avon, CT 06001	12 per day	unknown	unknown	unknown

*Please provide either the Medicare, Connecticut Department of Social Services (DSS), or National Provider Identifier (NPI) facility identifier and label column with the identifier used.
**Fill in year and identify the period covered by the Applicant's FY (e.g. July 1-June 30, calendar year, etc.). Label and provide the number of visits or discharges as appropriate.

***For periods greater than 6 months, report annualized volume, identifying the number of actual months covered and the method of annualizing. For periods less than six months, report actual volume and identify the period covered.

Current utilization represents 9 months of actual volume (October through June 2014) annualized.

c. Identify any special populations that utilize the service(s) and explain how these populations will maintain access to the service following termination at the specific location; also, specifically address how the termination of this service will affect access to care for Medicaid recipients and indigent persons.

There are no special patient populations utilizing the services described in this application at any of the five satellite locations.

Moreover, there will be no specific impact on Medicaid patients' access to care. Medicaid patients will continue to be seen by the private cardiology practices.

d. What impact will the proposal have upon the cost effectiveness of providing access to services provided under the Medicaid program? If not applicable to the proposal, explain why it is not applicable.

The proposed termination of the nuclear cardiology services is the most cost-effective and efficient way to reallocate Hospital resources as needed while continuing to maintain these same services to the community, Medicaid patients included. Access to these services provided under the Medicaid program will not change. Given decreasing volumes, there will be no change with respect to access as a result of closure of the 5 locations.

d. Provide evidence (e.g. written agreements or memorandum of understanding) that other providers in the area are willing and able to absorb the displaced patients.

No patients will be displaced. The three private cardiology practices will continue to provide nuclear cardiology imaging services at the same or alternative practice locations.

e. Describe how clients will be notified about the termination and transfer to other providers.

The Hospital will not be providing notice to patients as the patients will remain under the care of the same physicians.

3. **Actual and Projected Volume**

a. Provide volumes for the most recently completed FY by town.

TABLE 3
UTILIZATION BY TOWN

Town	Utilization FY 2013
Avon	164
Farmington	254
Hartford	466
Glastonbury	221
West Hartford	150

*Fill in year and identify the period covered by the Applicant's FY (e.g. July 1-June 30, calendar year, etc.). Label and provide the number of visits or discharges as appropriate.

b. Complete the following table for the past three fiscal years ("FY") and current fiscal year ("CFY"), for the number of visits/discharges, as appropriate, by service.

TABLE 4
HISTORICAL AND CURRENT VISITS/DISCHARGES

Service**	Actual Volume (Last 3 Completed FYs)			CFY Volume*
	FY2011	FY2012	FY2013	FY2014
Nuclear Cardiology	1,451	1,587	1,255	1,076
Total				

*For periods greater than 6 months, report annualized volume, identifying the number of actual months covered and the method of annualizing. For periods less than six months, report actual volume and identify the period covered.

Current fiscal year volume (FYTD 2014) represents 9 months actual volume annualized.

**Identify each service type and add lines as necessary. Provide the number of visits/discharges as appropriate for each service listed.
***Fill in years. In a footnote, identify the period covered by the Applicant's FY (e.g. July 1-June 30, calendar year, etc.).

c. Explain any increases and/or decreases in volume seen in the table(s) above.

Nuclear cardiology volumes have been trending downward nationally over the past several years. Hartford Hospital has experienced a decrease in nuclear imaging volumes consistent with national trends. The decrease in nuclear imaging volume is attributed to a number of factors including application of appropriate use criteria for diagnostic testing, greater insurance company authorization requirements, and availability of alternative testing modalities.

d. For DMHAS-funded programs only, provide a report that provides the following information for the last three full FYs and the current FY to-date:
   i. Average daily census;
   ii. Number of clients on the last day of the month;
   iii. Number of clients admitted during the month; and
   iv. Number of clients discharged during the month.

N/A. Nuclear cardiology is not a DMHAS funded program.

4. Projected Patient Population Mix:

a. Provide the current and projected volume (and corresponding percentages) by patient population mix; including, but not limited to, access to services by Medicaid recipients and indigent persons for the proposed program.

TABLE 5
APPLICANT'S CURRENT & PROJECTED PAYER MIX

Payer	Most Recently Completed FY**		Projected					
			FY**		FY**		FY**	
	Volume	%	Volume	%	Volume	%	Volume	%
Medicare*	590	55%	590	55%	590	55%	590	55%
Medicaid*	11	1%	11	1%	11	1%	11	1%
CHAMPUS & TriCare								
Total Government	**601**	**56%**	**601**	**56%**	**601**	**56%**	**601**	**56%**
Commercial Insurers	454	42%	454	42%	454	42%	454	42%
Uninsured	21	2%	21	2%	21	2%	21	2%
Workers Compensation								
Total Non-Government	**475**	**44%**	**475**	**44%**	**475**	**44%**	**475**	**44%**
Total Payer Mix	**1076**	**100%**	**1076**	**100%**	**1076**	**100%**	**1076**	**100%**

*Includes managed care activity.
**Fill in years. Ensure the period covered by this table corresponds to the period covered in the projections provided.
Note: The patient population mix should be based on patient volumes, not patient revenues.

b. Provide the basis for/assumptions used to project the patient population mix.

The projected payer mix represented in Table 5 above is based on the patient population currently being served by the Hospital at each location.

For the Medicaid population only, provide the assumptions and actual calculation used to determine the projected patient volume.

The projected Medicaid patient volume represented in Table 5 above is based on the patient population currently being served by the Hospital at each practice location.

c. If the proposal fails to provide or reduces access to services by Medicaid recipients or indigent persons, provide explanation for good cause for doing so. *Note: good cause shall not be demonstrated solely on the basis of differences in reimbursement rates between Medicaid and other health care payers.*

N/A. Access to services for the Medicaid population will not change as a result of this proposal.

5. Quality Measures

a. Submit a list of all key professional, administrative, clinical, and direct service personnel related to the proposal. Attach a copy of their Curriculum Vitae.

Please see Exhibit 3 for copies of curriculum vitae for key administrative and clinical personnel related to this proposal.

b. Explain how the proposal will improve quality, accessibility and cost effectiveness of health care delivery in the region, including but not limited to, (1) provision of or any change in the access to services for Medicaid recipients and indigent persons, and (2) the impact upon the cost effectiveness of providing access to services provided under the Medicaid program

The Hospital decided to discontinue provision of nuclear cardiology imaging services at these 5 outpatient locations due to declining volumes and decreasing profit margins. Notwithstanding, the impact on the patient population will be negligible because the existing private practice cardiologists at these nuclear cardiology locations will assume the same service. Since the private practice cardiologists either already own, or plan to own, and independently operate SPECT myocardial perfusion imaging cameras, there will be adequate capability to continue providing these services without any access issues. There will be no impact on access to services provided under the Medicaid program as there will be no change in the services provided for Medicaid patients.

c. Identify when the Applicants' funding and/or licensing agencies (e.g. DPH, DMHAS) were notified of the proposed termination, and when the Applicants' licenses will be returned.

Pending CON approval, the Hospital will notify the Nuclear Regulatory Commission (NRC) of its plans to discontinue nuclear cardiology services at the five satellite locations as described in this application.

6. Organizational and Financial Information

a. Identify the Applicant's ownership type(s) (e.g. Corporation, PC, LLC, etc.).

The Hospital is a non-profit corporation.

b. Does the Applicant have non-profit status?
X Yes (Provide documentation) ☐ No

Please see Exhibit 4 for a copy of the IRS Determination letter for Hartford Hospital.

c. Financial Statements

i. If the Applicant is a Connecticut hospital: Pursuant to Section 19a-644, C.G.S., each hospital licensed by the Department of Public Health is required to file with OHCA copies of the hospital's audited financial statements. If the hospital has filed its most recently completed fiscal year audited financial statements, the hospital may reference that filing for this proposal.

The Hospital's most recent audited financial statements are on file with OHCA.

ii. If the Applicant is not a Connecticut hospital (other health care facilities): Audited financial statements for the most recently completed fiscal year. If audited financial statements do not exist, in lieu of audited financial statements, provide other financial documentation (e.g., unaudited balance sheet, statement of operations, tax return, or other set of books).

d. Submit a final version of all capital expenditures/costs.

TABLE 6
TOTAL PROPOSAL CAPITAL EXPENDITURE

Purchase/Lease	Cost
Equipment (Medical, Non-medical Imaging) Land/Building Purchase* Construction/Renovation** Land/Building Purchase* Other (specify)	
Total Capital Expenditure (TCE)	
Lease (Medical, Non-medical Imaging)***	
Total Capital Cost (TCO)	
Total Project Cost (TCE+TCO)	

*If the proposal involves a land/building purchase, attach a real estate property appraisal including the amount; the useful life of the building; and a schedule of depreciation.
**If the proposal involves construction/renovations, attach a description of the proposed building work, including the gross square feet; existing and proposed floor plans; commencement date for the construction/ renovation; completion date of the construction/renovation; and commencement of operations date.
***If the proposal involves a capital or operating equipment lease and/or purchase, attach a vendor quote or invoice; schedule of depreciation; useful life of the equipment; and anticipated residual value at the end of the lease or loan term.

N/A. There are no capital expenditures associated with this proposal.

e. List all funding or financing sources for the proposal and the dollar amount of each. Provide applicable details such as interest rate; term; monthly payment; pledges and funds received to date; letter of interest or approval from a lending institution.

N/A. There are no capital expenditures associated with this proposal.

f. Demonstrate how this proposal will impact the financial strength of the health care system in the state or that the proposal is financially feasible for the applicant.

As explained in the response to question 5c above, the Hospital in discontinuing these services at the 5 locations is reassigning its resources in the most efficient and cost-effective manner. As a result of the discontinuance of the service and the capability of the private practice to provide the same service, there will be no access issues for any of our patients.

7. Financial Attachments I

a. Provide a summary of revenue, expense, and volume statistics, without the CON project, incremental to the CON project, and with the CON project. **Complete Financial Attachment I.** (Note that the actual results for the fiscal year reported in the first column

must agree with the Applicant's audited financial statements.) The projections must include the first three full fiscal years of the project.

Please see Exhibit 5 for Financial Attachment I.

b. Provide the assumptions utilized in developing **Financial Attachment I** (e.g., full-time equivalents, volume statistics, other expenses, revenue and expense % increases, project commencement of operation date, etc.).

Please see Exhibit 5 for Financial Attachment I.

c. Was the Applicant being reimbursed by payers for these services? Did reimbursement levels enter into the determination to terminate?

The Hospital is reimbursed for nuclear cardiology services by all payers. Although reimbursement for nuclear cardiology services has been declining over the past several years, the main reason for the service termination is declining patient volumes and the need to provide services to this population in a more cost effective manner.

d. Provide the minimum number of units required to show an incremental gain from operations for each fiscal year.

N/A.

e. Explain any projected incremental losses from operations contained in the financial projections that result from the implementation and operation of the CON proposal.

The financial impact of this proposal is projected to be negligible.

f. Describe how this proposal is cost effective.

This proposal is cost effective and efficient because it (1) addresses decreases in patient volumes by reducing the number of sites where nuclear cardiology imaging services are provided; (2) consolidates services under a single provider (practice) at each location where nuclear cardiology imaging services will continue and (3) permits the Hospital, by terminating its role in the service at these locations, to better utilize and allocate its resources

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List of Exhibits

1. **Exhibit 1 - Harford Hospital Board resolution approving the termination of nuclear cardiology services as described in this application.**

2. **Exhibit 2 - Information on national trends in nuclear cardiology.**

3. **Exhibit 3 - Copies of curriculum vitae for key administrative and clinical personnel related to this proposal.**

4. **Exhibit 4 for a copy of the IRS Determination letter for Hartford Hospital.**

5. **Exhibit 5 for Financial Attachment I.**

RESOLUTION
HARTFORD HOSPITAL
BOARD OF DIRECTORS
September 15, 2014

Termination of Nuclear Cardiology Imaging Services

WHEREAS, Hartford HealthCare Corporation, a Connecticut non-stock corporation is the parent of a health care delivery system comprised of several acute care hospitals and health care entities (the "System"), which System includes Hartford Hospital ("HH");

WHEREAS, HH management recommends the termination of outpatient nuclear cardiology imaging services which have been provided in physician practices in five locations in the greater Hartford Area; and

WHEREAS, the Bylaws of HH provide that HH's Board of Directors (the "Board") has the power to approve the filing of a Certificate of Need ("CON") for the termination of a service.

NOW, THEREFORE, it is hereby

RESOLVED, that the Board hereby approves the termination of the five nuclear cardiology imaging services at the provider-based sites and the filing of a CON application for the termination of these services;

RESOLVED, that the officers of Hartford Hospital or the System, are authorized and empowered, on behalf of HH to take or cause to be taken, such further action, as any such officer in his or her discretion may from time to time deem necessary, advisable or appropriate to carry out the actions contemplated by the foregoing resolutions, the taking of any such action to be conclusive evidence of the acting officer's approval thereof and of due authorization hereunder subject to any System policies and guidelines; and

RESOLVED, that all actions taken by any of the officers of the System in furtherance of any of the foregoing resolutions be, and the same hereby are, ratified and approved in all respects.

HARTFORD HOSPITAL

Certification

I, Carol S. Garlick, the Assistant Secretary of Hartford Hospital, do hereby certify that the foregoing is a true and correct copy of the resolutions adopted by the Board of Directors of Hartford Hospital at a duly noticed and convened meeting of said Board held on September 15, 2014, at which a quorum was present and voting throughout, and said resolutions have not been repealed or amended, and remain in full force and effect.

Assistant Secretary

9/18/14

Date

Letters

RESEARCH LETTER

Population Trends From 2000-2011 in Nuclear Myocardial Perfusion Imaging Use

Nuclear myocardial perfusion imaging (MPI) accounted for much of the rapid growth in cardiac imaging that occurred from the 1990s through the middle 2000s.[1,2] Factors potentially discouraging use (including publication of appropriate use criteria) have since emerged,[3] and recent data reveal modest declines in MPI use in the Medicare fee-for-service population.[4]

We investigated temporal trends in MPI use within a large, community-based population that included persons younger than 65 years and explored whether increasing use of other noninvasive imaging modalities potentially offset declining MPI use.

Methods | Patient-level data for MPI performed from 2000-2011 were obtained for members aged 30 years or older from the clinical databases of Kaiser Permanente Northern California, an integrated health care delivery system providing comprehensive inpatient and outpatient care for more than 2.3 million adults. We calculated age- and sex-adjusted annual rates of MPI tests/100 000 person-years using direct adjustment methods with 2011 as the reference year.

Denominators were member-months of membership in individuals with at least 1 month of membership during the year of interest. Linear trends in rates were assessed using the Cochran-Armitage test. Logistic regressions were used to assess interactions of age, sex, setting (outpatient vs inpatient), and prior coronary revascularization (for outpatients) on trends with a random-effects term included to account for clustering by facility. As a surrogate for incident coronary disease, trends in myocardial infarction (MI) were determined using previously described methods.[5] Two-sided *P* values of less than .05 were considered significant.

To assess potential substitution of other imaging modalities for MPI, annual rates of cardiac computed tomography and stress echocardiography from 2007-2011 were estimated using a referrals database. Manual audits of randomly selected referrals were performed to determine the positive predictive value (with 95% confidence intervals) of a referral resulting in a test being performed. Use of perfusion positron emission tomography and perfusion magnetic resonance imaging was negligible.

Analyses were performed using SAS version 9.3 (SAS Institute Inc). The institutional review board of the Kaiser Foundation Research Institute approved this study with a waiver of informed consent.

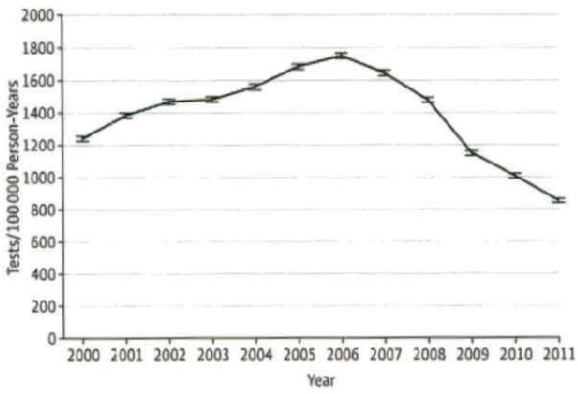
Results | Overall, MPI was used in 302 506 members during 23.2 million person-years of follow-up at 19 facilities. From 2000 until 2006, MPI use increased by 41% (95% CI, 39%-44%; $P < .001$ for trend) (**Figure**). In 2006, a reduction began that continued through 2011, with MPI use declining by 51% (95% CI, 50%-52%; $P < .001$ for trend) (adjusted odds ratio, 0.51 [95% CI, 0.44-0.60] for undergoing MPI in 2011 vs 2006). Relative declines from 2006 to 2011 did not differ by sex or revascularization history, but were greater for outpatients than inpatients (58% vs 31%; $P < .001$ for interaction) and for persons younger than 65 years vs those aged 65 years or older (56% vs 47%; $P < .001$ for interaction) (**Table**).

Stress echocardiography use (tests/100 000 person-years) was unchanged with 189 (95% CI, 180-199) in 2007 and 182 (95% CI, 173-191) in 2011 ($P = .93$). Cardiac computed tomography use (tests/100 000 person-years) increased from 37 (95% CI, 35-39) in 2007 to 73 (95% CI, 69-77) in 2011 ($P = .01$), and could have accounted for 5% of the observed decline in overall MPI use if performed as a substitute. During the period of declining MPI use, incident MI declined by 27% (95% CI, 24%-30%; $P < .001$) in the population from 286 (95% CI, 279-293) events/100 000 person-years to 208 (95% CI, 202-214) events/100 000 person-years.

Discussion | After increasing from 2000 to 2006, MPI use abruptly declined through 2011 within our population. Declines for persons aged 65 years or older exceeded those for the Medicare fee-for-service population during the same period[4] and were even greater for younger persons. These declines could not be explained by increasing use of alternative modalities.

Although the abrupt nature of the decline suggests changing physician behavior played a major role, incident coronary disease, as assessed by MI, also declined. We could not determine the relative effects of these factors on MPI use.

Figure. Age- and Sex-Adjusted Annual Rates of Nuclear Myocardial Perfusion Imaging Tests From 2000-2011



Error bars indicate 95% confidence intervals.

Table. Myocardial Perfusion Imaging (MPI) Trends

	2000 (Baseline)		2006 (Peak Use)		2011		Change in Rate, % (95% CI)	
	No.	Rate (95% CI)	No.	Rate (95% CI)	No.	Rate (95% CI)	2000-2006	2006-2011
Total MPI	19 326	1239 (1223 to 1256)	32 514	1748 (1730 to 1767)	17 323	855 (842 to 867)	41 (39 to 44)	−51 (50 to 52)
Sex[a]								
Female	8998	586 (570 to 601)	15 940	859 (841 to 877)	8591	424 (412 to 436)	47 (42 to 52)	−51 (49 to 52)
Male	10 328	653 (636 to 671)	16 574	889 (870 to 908)	8732	431 (418 to 444)	36 (32 to 41)	−52 (50 to 53)
Age, y[a]								
<65	9100	578 (565 to 590)	15 224	784 (770 to 798)	6970	344 (335 to 353)	36 (32 to 40)	−56 (55 to 58)
≥65	10 226	661 (634 to 688)	17 290	964 (934 to 995)	10 353	511 (490 to 531)	46 (39 to 54)	−47 (44 to 50)
Clinical setting								
Inpatient	4459	287 (279 to 295)	8470	455 (445 to 464)	6341	313 (305 to 321)	58 (53 to 64)	−31 (29 to 33)
Outpatient	14 867	952 (938 to 966)	24 044	1294 (1278 to 1310)	10 982	542 (532 to 552)	36 (33 to 39)	−58 (57 to 59)
Received PCI or CABG								
Yes[b]	4207	273 (266 to 281)	8833	482 (472 to 491)	4113	203 (197 to 209)	76 (70 to 82)	−58 (56 to 59)
No	10 660	679 (666 to 691)	15 211	812 (799 to 825)	6869	339 (331 to 347)	20 (17 to 23)	−58 (57 to 59)

Abbreviations: CABG, coronary artery bypass graft; PCI, percutaneous coronary intervention.

[a] Adjusted annual rates of tests per 100 000 person-years.

[b] Received PCI or CABG since 1996.

Our findings should be interpreted in the context of other limitations. The observed decline occurred in the context of a health care delivery system without direct financial incentives to perform tests. Nevertheless, the substantial reduction in MPI use demonstrates the ability to reduce testing on a large scale with anticipated reductions in health care costs.

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Author Contributions: Drs McNulty and Hung had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: McNulty.
Acquisition of data: Hung, Almers.
Analysis and interpretation of data: McNulty, Hung, Go, Yeh.
Drafting of the manuscript: McNulty.
Critical revision of the manuscript for important intellectual content: McNulty, Hung, Almers, Go, Yeh.
Statistical analysis: McNulty, Hung, Almers.
Obtained funding: McNulty.
Administrative, technical, and material support: McNulty.
Study supervision: McNulty, Yeh.

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1. Lucas FL, DeLorenzo MA, Siewers AE, Wennberg DE. Temporal trends in the utilization of diagnostic testing and treatments for cardiovascular disease in the United States, 1993-2001. *Circulation*. 2006;113(3):374-379.

2. Andrus BW, Welch HG. Medicare services provided by cardiologists in the United States: 1999-2008. *Circ Cardiovasc Qual Outcomes*. 2012;5(1):31-36.

3. Brindis RG, Douglas PS, Hendel RC, et al; American College of Cardiology Foundation Quality Strategic Directions Committee Appropriateness Criteria Working Group; American Society of Nuclear Cardiology; American Heart Association. ACCF/ASNC appropriateness criteria for single-photon emission computed tomography myocardial perfusion imaging (SPECT MPI): a report of the American College of Cardiology Foundation Quality Strategic Directions Committee Appropriateness Criteria Working Group and the American Society of Nuclear Cardiology endorsed by the American Heart Association. *J Am Coll Cardiol*. 2005;46(8):1587-1605.

4. Levin DC, Parker L, Intenzo CM, Rao VM. Recent reimbursement changes and their effect on hospital and private office use of myocardial perfusion imaging. *J Am Coll Radiol*. 2013;10(3):198-201.

5. Yeh RW, Sidney S, Chandra M, Sorel M, Selby JV, Go AS. Population trends in the incidence and outcomes of acute myocardial infarction. *N Engl J Med*. 2010;362(23):2155-2165.

COMMENT & RESPONSE

Antithrombotic Therapy After Transcatheter Aortic Valve Replacement

To the Editor A solid evidence base for appropriate antithrombotic therapy in patients with complex transcatheter aortic valve replacement (TAVR) is not yet established. This is especially important because approximately 40% of patients with TAVR from both the Society of Thoracic Surgeons/American College of Cardiology Transcatheter Valve Therapy (STS/ACC TVT) registry[1] and the Placement of Aortic Transcatheter Valves (PARTNER) trial[2] cohorts had baseline diagnosis of atrial fibrillation (AF) and may have had an indication for anticoagu-

Cardiovascular Rounds

CV imaging ranks highly among unnecessary procedures

9:22 AM on April 5, 2012 by Brian Maher

Comment (0)

As part of the Choosing Wisely initiative spearheaded by the American Board of Internal Medicine (ABIM) Foundation, nine professional societies have jointly released a list of 45

unnecessary medicine and increase dialogue between patients and physicians in selecting the most appropriate test or therapy for a given patient's condition.

Initially announced in March 2011, the Choosing Wisely initiative tasked nine professional societies—including the American College of Cardiology, American Society of Nuclear Cardiology, and American Society of Radiology—to identify five tests or therapies that physicians and patients should question due to their potential for "inappropriate" use. They were given the following parameters to create their respective lists:

- Each test or therapy should be within the specialty's purview and control
- Each test or therapy should be used frequently and/or carry a significant cost
- Each test or therapy deemed to be of dubious necessity must be supported by evidence

The complete listing of the 45 tests and therapies can be found on the Choosing Wisely website.

CV imaging in the crosshairs

In examining the list of tests and therapies identified by the professional societies, it is clear that cardiovascular imaging tests are highly scrutinized for their appropriate use. Overall, 12 of the 45 identified tests and therapies are cardiovascular-related, of which nine apply to non-invasive cardiac imaging. The tests and therapies that should not be ordered or performed are listed below (the society recommending the test or therapy is listed in parentheses).

- Annual electrocardiograms (EKGs) or any other cardiac screening for low-risk patients without symptoms (AAFP and ACP)
- Stress cardiac imaging or advanced non-invasive imaging in the initial evaluation of patients without cardiac symptoms unless high-risk markers are present (ACC)
- Annual stress cardiac imaging or advanced non-invasive imaging as part of routine follow-up in asymptomatic patients (ACC)
- Stress cardiac imaging or advanced non-invasive imaging as a pre-operative assessment in patients scheduled to undergo low-risk non-cardiac surgery (ACC)
- Echocardiography as routine follow-up for mild, asymptomatic native valve disease in adult patients with no change in signs or symptoms (ACC)
- Stenting of non-culprit lesions during PCI for uncomplicated hemodynamically stable STEMI (ACC)
- Stress cardiac imaging or coronary angiography in patients without cardiac symptoms unless high-risk markers are present (ASNC)
- Cardiac imaging for patients who are at low-risk (ASNC)
- Radionuclide imaging as part of routine follow-up in asymptomatic patients (ASNC)
- Cardiac imaging as a pre-operative assessment in patients scheduled to undergo low-

their limited clinical utility, the American Society of Nuclear Cardiology endorses the use of methods to reduce radiation exposure in cardiac imaging, whenever possible, including non-performing tests when limited benefits are likely.

Leading to more controversy?

Despite being a collaborative effort by the nine professional societies, the lists of identified tests and therapies were formulated individually by each society. As a result, many societies—such as the American College of Cardiology and American Society of Nuclear Cardiology—arrived at similar tests (primarily imaging) which should not be performed in certain clinical scenarios.

However, slight nuances exist between the societies' recommendations. For example, the ACC indicates stress cardiac imaging or non-invasive advanced imaging should not be performed in patients without cardiac symptoms unless high-risk markers are present. Despite referencing the same clinical indication as the ACC, the ASNC indicates coronary angiography (an invasive procedure) should also not be used for this indication. Other conclusions are similar, but are worded in very different ways. The net result could be further controversy—and possible confusion—among physicians and patients in determining when various CV imaging tests are clinically inappropriate.

Elevating the appropriate use of CV imaging

Non-invasive diagnostic imaging is fundamental to cardiovascular programs, serving to both optimize care pathways and generate direct and downstream services. While an enduring source of value to the service line, the seemingly unabated growth in volumes and expenditures in recent years has led to heightened scrutiny and industrywide reforms to right-size utilization and slow spending. To help ensure the optimal utilization of CV imaging tests, professional societies continue to develop appropriate use criteria (AUC) to help guide not only the appropriate performance of CV imaging tests themselves, but also the appropriate ordering of the tests by referring physicians.

In the upcoming **Cardiovascular Roundtable's 2012-2013 national meeting series**, we examine the role of CV imaging as part of service line growth strategy, with particular focus on **elevating the appropriate use of CV imaging by ordering physicians, integrating the CV imaging network across all sites of care, and leveraging CV imaging to enhance market capture and generate downstream services**.

For further information on CV imaging and other priority topics addressed in the upcoming 2012-2013 national meeting series, please feel free to email me directly at maherb@advisory.com.

Cardiovascular Rounds

New CV imaging AUC released, but how much will it help?

12:38 PM on April 24, 2013

Brian Maher, Cardiovascular Roundtable

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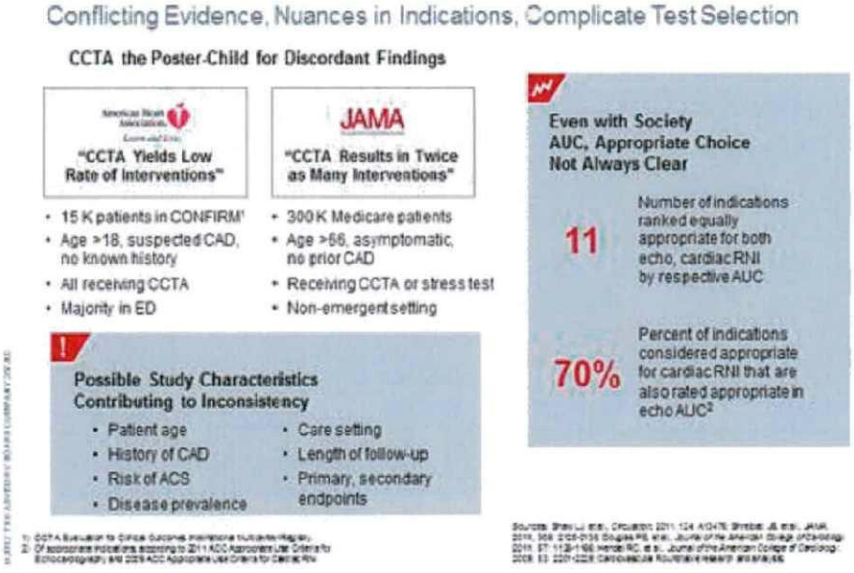
calendar year. The predominant modalities in heart failure management include echocardiography, SPECT-based nuclear imaging, and cardiac MRI, with cardiac CT and PET finding relatively infrequent use.

No easy task in defining the "best" modality

Despite the near ubiquitous use of CV imaging in heart failure patients, many questions remain about which modalities are optimally suited for specific clinical scenarios. Available (AUC) developed by the ACC and other CV societies have primarily centered upon a given CV imaging modality, like echocardiography, and classifying which clinical indications are considered to be appropriate, uncertain, or inappropriate for the modality. However, Roundtable analyses have found that when comparing available AUC for some modalities, like echocardiography and cardiac nuclear imaging, there are certain common indications in which the modalities are equally appropriate. This leads to challenges in determining which modality is optimal and should be utilized when the clinical effectiveness is deemed equal.



While the CV-focused AUC are primarily procedure-centric, the ACR's criteria more

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a more clear consensus of which modality is best for heart failure patients, the ACC and ACR jointly released new AUC to facilitate provider decision-making in selecting the most appropriate test.

Taking a different tack from previous AUC, the new utilization guidelines are based upon specific clinical scenarios, with CV imaging modalities rated as appropriate, maybe appropriate, and rarely appropriate for clinical indications within the scenarios. Further, the ratings are based upon either a rest-only or rest-and-stress approach. The clinical scenarios evaluated in the new AUC are:

- Initial evaluation of cardiac structure and function in newly suspected or potential heart failure
- Evaluation for ischemic etiology
- Viability evaluation (after ischemic etiology determined) known to be amenable to revascularization with our without clinical angina
- Consideration and follow-up for implantable cardioverter-defibrillator (ICD)/cardiac resynchronization therapy (CRT)
- Repeat evaluation of heart failure

Undoubtedly, these joint criteria will help advance provider decision-making capabilities in CV imaging test selection for heart failure patients. However, upon closer examination, some questions remain regarding their clinical utility. Foremost, for some clinical indications, like the evaluation of ischemic etiology for angina/ischemic equivalent syndrome, all CV imaging modalities at rest-stress are considered to be appropriate. This illustrates the primary deficit of the new utilization guidelines, and returns to a fundamental challenge—when certain CV imaging modalities are classified as equally appropriate, how do you select which modality to use?

Guidance in optimizing appropriate use of CV imaging services

The Roundtable sought to address this question in the latest research from the 2012-2013 national meeting series on "CV Imaging as the Nexus of Growth." In addition to providing a market outlook for CV imaging services, practices to integrate sites of

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...ce the value of your program's CV imaging services, register for our upcoming webconferences:

Cardiovascular Imaging as the Nexus of Growth, Part I
Market overview of CV imaging services, strategies to ensure appropriate utilization on May 14, 2013

Cardiovascular Imaging as the Nexus of Growth, Part II
Integrating CV imaging sites of care, leveraging CV imaging for enhanced market capture on May 30, 2013

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00029

The Reading Room

Another perspective: The demise of nuclear imaging?

8:50 AM on April 14, 2014

Comment (0)

Natalie McGarry, Imaging Performance Partnership

team, Matt often discusses technology questions with members.

As you may know, nuclear imaging is in trouble, and the problem is not with the technology itself, but with the supply of the key radiotracer used in many studies: technetium-99m (Tc-99).

The problem

As you know, Tc-99 is used for nuclear myocardial perfusion imaging (MPI) and bone scans, both of which can make up over 70% of nuclear medicine volumes. Currently, just two aging nuclear reactors produce about two-thirds of the total global supply of technetium.

You might remember that problems in these plants resulted in a global shortage of Tc-99 in 2008-2010, giving rise to alternative modalities such as cardiac PET. One of these key reactors, Canada's Chalk River, plans to cease Tc-99 production in 2016, which could badly disrupt global supply chains for the radiotracer, resulting in higher prices and potentially periods in which Tc-99 is unavailable.

So, what can we do to prepare?

Matt shared some of the questions this member asked. Here are some of his ideas:

The Reading Room: Are businesses considering shifting nuclear imaging applications to alternative modalities, and if so, which ones?

Matt Morrill: Two of the major uses for nuclear imaging do have surrogate technologies.

Coronary CT angiography and CT perfusion can potentially replace nuclear myocardial perfusion imaging. In the emergent setting, cardiac CT can be used to triage chest pain patients to determine who requires coronary angiography and who does not, thus taking the place of SPECT imaging. Another modality, cardiac MRI, also shows comparable results to SPECT for heart disease diagnosis. Investing in both cardiac CT and cardiac MRI could be a good hedge against the Tc99 shortage.

During the last Tc-99 shortage, cardiac PET also gained traction, but that technology has a very unfavorable cost profile due to the need to lease a rubidium generator or maintain an on-site cyclotron. Bone scanning, on the other hand, can be accomplished with sodium fluoride (Na F-18) PET scans, and the National Oncology PET Registry (NOPR) has transitioned from collecting data on FDG-PET to Na F-18 PET.

RR: How are providers thinking differently about their nuclear imaging fleets as a

projections and unused capacity often lead providers to consolidate their gamma camera fleets. So, instead of replacing aging gamma cameras, many providers will just decommission them.

In my experience, we have not yet encountered hospital systems planning to no longer offer nuclear imaging in fear of the radioisotope shortage. However, cardiology practices being purchased by health systems often decommission their nuclear imaging equipment in favor of the hospital's equipment, depending on the physician income model used.

RR: Are businesses contemplating other strategies to deal with what may potentially be higher cost isotopes, greater isotope shortage frequency, and extended time for delivery, and if so, what are they?

MM: During the last technetium shortage, providers had to simply turn the clock back and use thallium-201. So, if a practice does not yet have sources of this radiopharmaceutical in its current supply chain, administrators should investigate adding one.

Alternative sources of Tc-99 could become available as well. NorthStar, a startup company, is planning to use the University of Missouri Research Reactor to convert molybdenum-98 to molybdenum-99, the precursor to Tc-99. SHINE Medical Technologies is another startup developing alternative sources for Tc-99.

How are You Thinking about the Looming Tc-99 Shortage?

Comment below to let us know how your organization plans to prepare.

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Stuart K Markowitz, MD, FACR

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Education

Yale University and University of Pennsylvania: Visiting Fellowships in Gastrointestinal Radiology	July-October 1985
Hartford Hospital: Diagnostic Radiology Residency	1982-1985
Hartford Hospital: Flexible Internship	1981-1982
University of Health Sciences – The Chicago Medical School Degree: M.D.	1977-1981
University of Pennsylvania – Degree: B.A.	1973-1977

Professional Work Experience

Hartford Hospital: President, Hartford Hospital & Hartford Region	2013 - present
Hartford Hospital: Chief Medical Officer and Vice President	2012-2013
Jefferson Radiology: Radiologist	1985-2011

Administrative and Professional Activities

Board of Directors, VNA Healthcare	2012-present
Board of Directors, HPA and HPHO, Hartford Hospital	2012-present
Hartford Healthcare Board Quality and Safety Committee	2010-present
Hartford Hospital Board Credentialing and Quality Committee	2010-present
Board of Directors, Hartford Hospital	2010-2011
Vice President, Medical Staff, Hartford Hospital	2010-2011
Chairman, Department of Radiology, Hartford Hospital	1995-2011
Vice Chair, Department of Radiology, Hartford Hospital	1992-1995
Medical Director, Radiology Technology Program, Hartford Hospital	1990-2011
Section Chief, Gastrointestinal Radiology, Hartford Hospital	1985-2011
Section Chief, Emergency Radiology, Hartford Hospital	1992-2007
Full Time Instructor in the Diagnostic Radiology Residency Program at Hartford Hospital	1985-present

	Partner, Jefferson Radiology (Jefferson X-Ray Group)	1986-2011
	Board of Directors, Jefferson Radiology	1988-2011
	President, 937-941 Farmington Avenue Limited Partnership	1991-2011
	American College of Radiology Practice Certification Reviewer	1985-1990
	Statewide Healthcare Facilities Planning Advisory Body, Department of Public Health, CT	2010-present
	Office of Healthcare Access CON Task Force	2009-present
	Connecticut State Radiology Society Legislative Committee	2005-2009
	Hospital Committee Experience : Medical Staff Council, Executive Committee of the Medical Staff, Joint Conference Committee, Mead Fund Committee, Library Committee, Credentials Committee, Radiation Safety Committee, Radiology Management Committee, Radiology Quality Council, Risk Management Committee, Claims Review Committee, Radiology/IT Steering Committee, Reimbursement Committee, Technology Advisory Group, Endovascular Credentialing Committee, OR Committee, EMR Committee, IS Physician Advisory Committee, Tumor Board	
	Hartford Hospital CEO Advisory Body	2009-present

Certifications	Medical License – State of Massachusetts	2011
	Fellowship in the American College of Radiology: FACR	2009
	American Board of Radiology	1985
	Medical License – State of Connecticut	1983
	National Board of Medical Examiners	1982

Hospital Appointments	Hartford Hospital, Senior Attending Staff – Hartford, Connecticut
	Connecticut Children's Medical Center, Attending Staff – Hartford, Connecticut
	University of Connecticut Health Center, Assistant Clinical Professor – Farmington, Connecticut
	Johnson Memorial Hospital, Attending Staff – Stafford Springs, Connecticut
	Windham Hospital, Attending Staff – Willimantic, Connecticut
	Day Kimball Hospital, Attending Staff – Putnam, Connecticut
	Noble Hospital, Attending Staff – Westfield, Massachusetts

Current Memberships

Society of Chairman of Academic Radiology Departments
American College of Radiology
American Society of Emergency Radiology – Fellow
Radiologic Society of North America
American Roentgen Ray Society
Connecticut State Radiology Society
Society of Breast Imaging – Fellow
American College of Physician Executives

Publications

ZITER FMH, MARKOWITZ SK, ZAMSTEIN J. LARGE RENAL PELVIC DEFECTS CAUSED BY SOUGHED PAPILLA. APPLIED RADIOLOGY, NOV. 1987.

PISTOIA F AND MARKOWITZ S. SPLENIC LYMPHANGIOMATOSIS: CT DIAGNOSIS. AJR 150: 121-22, JANUARY 1988.

MARKOWITZ S AND ZITER F. THE LATERAL CHEST FILM AND PNEUMOPERITONEUM. ANNALS OF EMERGENCY MEDICINE 15:4 APRIL 1986.

JACOBS J AND MARKOWITZ S. CT DIAGNOSIS OF UTERINE LIPOMA. AJR 150:1335-1336, JUNE 1988.

WOLF S AND MARKOWITZ S. SPONTANEOUS GAS FORMATION IN A STERILE RENAL CELL CARCINOMA. UROLOGIC RADIOLOGY 9:222-224, 1988.

PISTOIA F, MARKOWITZ S, SUSSMAN S. CONTRAST MATERIAL IN POSTERIOR VAGINAL FORNIX MIMICKING BLADDER RUPTURE: CT FEATURES. JCAT 13(1):153-155 JAN/FEB 1989.

MILICI L AND MARKOWITZ S. INTRAMURAL GASTRIC PSEUDOCYST: CT DIAGNOSIS. GASTROINTESTINAL RADIOLOGY, VOL 14:113-114, 1989.

TREEM WR, MARKOWITZ SK, SULLIVAN BM, HYAMS JS. DEFECOGRAPHY IN CHILDREN WITH PROLONGED CONSTIPATION. ABSTRACT SUBMITTED AT THE NORTH AMERICAN SOCIETY FOR PEDIATRIC GASTROENTEROLOGY AND NUTRITION, 1990.

MARKOWITZ SK, ZITER FMH. RADIOLOGIC DIAGNOSIS OF BOWEL OBSTRUCTION. IN: BOWEL OBSTRUCTION, CLINICAL DIAGNOSIS AND MANAGEMENT. J. WELCH, ED. SAUNDERS, 1990.

SAWHNEY R, REES JH, MARKOWITZ SK. CLOSTRIDIAL GAS GANGRENE COMPLICATING LEUKEMIA. ABDOMINAL IMAGING 19:45102, 1994.

SCAPPATICCI F AND MARKOWITZ SK. INTRAHEPATIC PSEUDOCYST COMPLICATING ACUTE PANCREATITIS: IMAGING FINDINGS. AJR, 1995; 165:873-4.

MARKOWITZ SK. DELAYED RUPTURE OF THE GALLBLADDER: DIAGNOSIS BY ERCP. SUBMITTED FOR PUBLICATION.

MARKOWITZ SK. BILIARY OBSTRUCTION DUE TO DUODENAL DIVERTICULUM: DIAGNOSIS BY CT AND ERCP. SUBMITTED FOR PUBLICATION.

MARKOWITZ SK. LONG TERM ALIMENTATION: COMPARISON

OF INTRAVENOUS AND NASOENTERIC ALIMENTATION. WORK IN PROGRESS.

ALLMENDINGER N, HALLISEY MJ, MARKOWITZ SK, ET AL. BALLOON DILATION OF ESOPHAGEAL STRICTURES IN CHILDREN. J. OF PEDIATRIC SURGERY, VOL 31, NO 3, P334-6, MARCH 1996.

CIRAULO DL, NIKKANEN HE, PALTER M, MARKOWITZ S, ET AL. CLINICAL ANALYSIS OF THE UTILITY OF REPEAT COMPUTED TOMOGRAPHIC SCAN BEFORE DISCHARGE IN BLUNT HEPATIC INJURY. JOURNAL OF TRAUMA 41(5):821-824, NOVEMBER 1996.

MARKOWITZ SK, KIRECZYK W. RADIOLOGIC EVALUATION OF DIVERTICULAR DISEASE OF THE SMALL AND LARGE INTESTINES. IN DIVERTICULAR DISEASE: MANAGEMENT OF THE DIFFICULT SURGICAL CASE. J. WELCH, ED. WILLIAMS AND WILKINS, 1997.

Recognitions Awards

Best Doctors in Hartford, Hartford Magazine	2004-2012
Best Doctors in Connecticut, Connecticut Magazine	2010-2012

Current Work Contact Information

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Personal

Born: April 22, 1955 – Brooklyn, New York

Wife: Debra Markowitz

Children: Melissa, Jessica, Nicole, Zachary
Stepson: Devin

GERALD J. BOISVERT, CPA, FHFMA
18 Alexander Place
South Windsor, CT 06074
860-644-6491 (Home)
860-545-0585 (Work)

Work Experience

April 2013	**Vice President & Chief Financial Officer**
To present	**Harford Hospital, Hartford, Connecticut**

Chief Financial Officer for 867 bed tertiary care academic medical center.

May 1997	**Executive Vice President & Chief Financial Officer**
To April 2013	**Connecticut Children's Medical Center, Hartford, Connecticut**

Executive Vice President & Chief Financial Officer for Connecticut's only independent Children's Hospital, and related entities (Faculty Practice Plan, School, and Foundation). Significant operational experience includes active financial oversight of 100 plus physician practice plan. Current responsibilities include Finance and Accounting, Revenue Cycle, Strategic Planning/Project Management/Process Improvement, Purchasing/Materials Management, Environmental Services, Facilities, Food Service, and Safety/Security. Previous responsibilities included oversight of IS, Community Relations, Rehabilitation Services, Pharmacy, Radiology and other ancillary services.

April 1996	**Vice President, Finance and Chief Financial Officer**
To May 1997	**US HomeCare Corp., Hartford, Connecticut**

Chief Financial Officer, reporting directly to the Chairman of the Board for publicly traded home care company. Responsibilities included direct supervision of accounting department, MIS department, and human resources department. Also responsible for investor relations, corporate secretary functions, SEC reporting, Medicare cost reporting, treasury and banking relationships. Worked in a turnaround/restructuring mode with crises management team and banks to stabilize and prepare company for sale.

August 1992	**Senior Vice President, Finance**
To April 1996	**Windham Community Memorial Hospital Willimantic, Connecticut**

Chief Financial Officer of 130-bed, acute care hospital, reporting to the President & CEO. Responsible for the following functions: Finance, Billing, Admitting/Registration, MIS, Medical Records, Personnel and Purchasing departments. Significant focus and

involvement with third party reimbursement, regulatory issues, banking/financing matters and union negotiations.

April 1988 To August 1992 — **Executive Vice President – Finance and Administration, Alden Design, Inc., Glastonbury, Connecticut**

Chief Financial and Administrative Officer of multi-location, full service communications company providing communications, consulting and production services to Fortune 1000 companies. Specific areas of responsibility included cash management, accounting, strategic planning, budgeting, human resources administration and company marketing/advertising.

September 1980 To April 1988 — **Senior Manager, Ernst & Whinney, Hartford, Connecticut**

Certified Public Accountant. Responsible for audit and special project consulting engagements for companies involved in manufacturing, banking, health care, education and non-profit services.

July 1979 To September 1980 — **Advanced Staff Accountant, Wolf & Company, Boston, Massachusetts**

Staff accountant for regional accounting firm located in Massachusetts. Served as staff accountant and in-charge accountant on savings bank, construction and small business audit engagements.

Education

Boston University School of Management
B.S. in Business Administration

Professional

Certified Public Accountant
Fellow, Health Care Financial Management Association

Member: American Institute of Certified Public Accountants; Connecticut Society of Certified Public Accountants; Health Care Financial Management Association; American College of Healthcare Executives

Community Service

Former Board Member and Finance Committee Chair of University of St. Joseph; Treasurer and member of the Board of Directors of the Capital Area Health Consortium; member of Committee of Hospital Finance for The Connecticut Hospital Association;

18 Alexander Place · South Windsor, Connecticut 06074
Home: 860-644-6491 · Work: 860-545-8557

Community Service - continued

Former President and former Treasurer of Southside Institution Neighborhood Alliance (SINA) and former Chairman of the Board of The Learning Corridor Corporation; former Finance Chairman and Personnel Chairman of Canon Greater Hartford Open (PGA Tournament); former member of Vernon, Connecticut Economic Development Commission; and former Treasurer and Director of Sunshine Project, Inc. (a non-profit organization involved in housing and support services for the psychiatrically disabled).

Recognized as CFO of the year by Hartford Business Journal - 2011

Other Interests: Enjoy sailing, skiing, running, tennis and golf.

18 Alexander Place · South Windsor, Connecticut 06074
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CURRICULUM VITAE

W. LANE DUVALL, MD, FACC

Date of preparation: July 1, 2013

GENERAL INFORMATION

Birth date: November 17, 1971

Birth place: Lubbock, Texas

Citizenship: U.S.A.

Home Address:	35 Walbridge Road West Hartford, CT 06119
Home Phone:	(860) 503-3537
Cellular Phone:	(917) 456-2586
Home E-mail Address:	lane.duvall@gmail.com
Business Address:	Hartford Hospital Nuclear Cardiology 80 Seymour Street Hartford, CT 06102
Business Phone:	(860) 545-5517
Business Fax:	(860) 545-5631
Business E-mail Address:	lane.duvall@hhchealth.org

ACADEMIC APPOINTMENTS

2004-06 Instructor Department of Medicine, Mount Sinai Medical Center

2004-11 Assistant Director of the Cardiac Care Unit, Mount Sinai Medical Center

2006-10 Associate Director of the Cardiology Fellowship Training Program, Mount Sinai Medical Center

2006-11 Assistant Professor Department of Medicine, Mount Sinai Medical Center

2011- Associate Professor Department of Medicine, Mount Sinai Medical Center

2013- Director Nuclear Cardiology, Hartford Hospital

HOSPITAL APPOINTMENTS

2006-13 Mount Sinai Hospital Pharmacy and Therapeutics Committee

2008-13 Mount Sinai Heart Performance Improvement Committee

2013- Hartford Hospital Radiation Safety Committee

EDUCATION

1990-94	***Princeton University*** Princeton, New Jersey Major in Molecular Biology Minor in Engineering Biology	B.A. Cum Laude, Phi Beta Kappa
1994-98	***Yale University School of Medicine*** New Haven, Connecticut	M.D.

POSTDOCTORAL TRAINING

1998-99 Intern, Internal Medicine
Duke University Medical Center, Durham, N.C.

1999-01 Resident, Internal Medicine
Duke University Medical Center, Durham, N.C.

2000-01 Assistant Chief Resident
Duke University Medical Center, Durham, N.C.

2001-04 Fellow, Cardiovascular Disease
Mount Sinai Medical Center, New York, N.Y.

CERTIFICATION

2001 American Board of Internal Medicine
Diplomat in Internal Medicine
Certificate No. 203082

2004 American Board of Internal Medicine
Diplomat in Cardiovascular Disease
Certificate No. 203082

2004 Nuclear Cardiology
Diplomat in Nuclear Cardiology
Certificate No. 3283

2005 Level III Echocardiography
Training July 2001 – January 2005

2005 Level III Nuclear Cardiology
Training July 2001 – January 2005

LICENSURE

1998 State of North Carolina
Graduate Medical Training License No. 82801
Expired 2001

2001- State of New York
License No. 220964
Date of issue: 2001
Date of last registration: 2012

2013- State of Connecticut
License No. 51946

2013- State of Connecticut Controlled Substance Registration
License No. 54313

2001- Drug Enforcement Agency
DEA No. BD7324762

HONORS AND AWARDS

2003 Mount Sinai Physician of the Year Nominee

2005 Recognition for Commitment to Excellence in Patient Care Mount Sinai Hospital

2009 Elected Fellow of the American College of Cardiology

2010 Best Clinical Imaging Paper in the Journal of Nuclear Cardiology 2009-2010 for "The Prognosis of a Normal Stress-Only Tc-99m Myocardial Perfusion Imaging Study"

2010 Department of Medicine Excellence in Teaching Award

2011 Best Clinical Imaging Paper in the Journal of Nuclear Cardiology 2010-2011 for "Reduced Isotope Dose with Rapid SPECT MPI Imaging: Initial Experience with a CZT SPECT Camera"

PROFESSIONAL MEMBERSHIPS

1994-04 American Medical Association

2001- American College of Cardiology

2007- American Heart Association

2012- American Society of Echocardiography

GRANT SUPPORT

2007-08 American Society of Echocardiography $25,000
Cardiovascular Sonographer Research Award
"A standardized technician facilitated protocol for use in V-V optimization of biventricular pacemakers for cardiac resynchronization therapy"

2007-08 St Jude Medical
DETECT Study CRD#405 $25,000
"Comparison of St Jude's Quick-Opt V-V optimization system with conventional echocardiographic measures used in V-V optimization"

PUBLICATIONS

PEER REVIEWED REPORTS

1. Higgins PD, Russo C, Scheurer M, Duvall WL. How Well Do We Treat Elevated LDL-Cholesterol? Results From a University Residents' Clinic. *NCMJ* 2002; 63 (5): 247-252.

2. Duvall WL, Blazing MA, Saxena S, Guyton JR. Targeting Cardiovascular Risk Associated with Both Low Density and High Density Lipoproteins Using Statin-Niacin Combination Therapy. *J Cardiovasc Risk* 2002; 9: 339-347.

3. Duvall WL, Croft LB, Corriel JS, Einstein AJ, Fisher JE, Haynes PS, Rose RK, Henzlova MJ. SPECT Myocardial Perfusion Imaging in the Morbidly Obese: Image Quality, Hemodynamic Response to Pharmacologic Stress, Diagnostic and Prognostic Value. *J Nuc Cardiol* 2006; 13: 202-209.

4. Croft LB, Duvall WL, Goldman ME. A Pilot Study of the Clinical Impact of Hand-Carried Cardiac Ultrasound in the Medical Clinic. *Echocardiography* 2006; 23: 439-446.

5. Lubitz SA, Duvall WL, Kim MC, and Henzlova M. Dobutamine-Induced Myocardial Infarction with Normal Coronary Arteries During Stress SPECT Myocardial Perfusion Imaging. *J Nuc Cardiol* 2007; 14: 613-616.

6. Fischer A, Hansalia R, Buckley S, Goldberg R, Goldman M, Muntner P, Mehta D, Duvall WL. Lack of Clinical Predictors of Optimal V-V Delay in Patients with Cardiac Resynchronization Devices. *J Interv Card Electrophysiol* 2009; 25: 153-158.

7. Hermann LK, Weingart SD, Duvall WL, Henzlova MJ. The Limited Utility of Routine Cardiac Stress Testing in Emergency Department Chest Pain Patients Younger than 40 Years. *Ann Emerg Med* 2009; 54: 12-16.

8. Hermann LK, Weingart SD, Yoon YM, Genes NG, Nelson BP, Shearer PL, Duvall WL, Henzlova MJ. Comparison of Frequency of Inducible Myocardial Ischemia in Patients Presenting in the Emergency Department with Typical versus Atypical or Non-Anginal Chest Pain. *Am J Cardiol* 2010; 105: 1561-1564.

9. Duvall WL, Wijetunga MN, Klein TM, Razzouk L, Godbold J, Croft LB, Henzlova MJ. The Prognosis of a Normal Stress-Only Tc-99m Myocardial Perfusion Imaging Study. *J Nuc Cardiol* 2010; 17: 370-377.

10. Duvall WL, Hansalia R, Wijetunga MN, Buckley S, Fischer A. Advantage of Optimizing V-V Timing in Cardiac Resynchronization Therapy Devices. *PACE* 2010; 33:1161-1168.

11. Whang W, Shimbo D, Kronish IM, Duvall WL, Julien H, Iyer P, Burg MM, Davidson KW. Depressive Symptoms and All-cause Mortality in Unstable Angina Patients: Findings from the Coronary Psychosocial Evaluation Studies (COPES). *Am J Cardiol* 2010;106:1104-7.

12. Duvall WL, Croft LB, Godiwala T, Ginsberg E, George T, Henzlova M. Reduced Isotope Dose with Rapid SPECT MPI Imaging: Initial Experience with a CZT SPECT Camera. *J Nuc Cardiol* 2010; 17: 1009-1014.

13. Chow E, Hermann L, Duvall WL. Iatrogenic Claudication from a Vascular Closure Device after Cardiac Catheterization. *West J Emerg Med* 2010; 11: 512-513.

14. Duvall WL, Croft LB, Ginsberg ES, Einstein AJ, Guma KA, George T, Henzlova MJ. Reduced Isotope Dose and Imaging Time with a High Efficiency CZT SPECT Camera. *J Nuc Cardiol* 2011; 18: 847-857.

15. Duval WL, Sweeny JM, Croft LB, Barghash MH, Kulkarni NK, Guma KA, Henzlova MJ. Comparison of High Efficiency CZT SPECT MPI to Coronary Angiography. *J Nuc Cardiol* 2011; 18: 595-604.

16. Duvall WL, Wijetunga MN, Klein TM, Hingorani R, Khan SM, Hermann LK, Henzlova MJ. Stress-Only Tc-99m Myocardial Perfusion Imaging in an Emergency Department Chest Pain Unit. *J Emerg Med* 2012; 42: 642-650. (Epub Aug 27, 2011)

17. Duvall WL, Sealove B, Pungoti C, Katz D, Moreno P, Kim M. Angiographic Investigation of the Pathophysiology of Perioperative Myocardial Infarction. *Catheter Cardiovasc Interv* 2012. 80: 768-776. (Epub Mar 14, 2012)

18. Duvall WL, Sweeny JM, Croft LB, Ginsberg ES, Guma KA, Henzlova MJ. Reduced Stress Dose with Rapid Acquisition CZT SPECT MPI in a Non-Obese Clinical Population: Comparison to Coronary Angiography. *J Nuc Cardiol* 2012; 19: 19-27.

19. Duvall WL, Hiensch RJ, Levine EJ, Croft LB, Henzlova MJ. The Prognosis of a Normal Tl-201 Stress-Only SPECT MPI Study. *J Nuc Cardiol* 2012. 19: 914-921. (Epub Jul 20, 2012)

20. Duvall WL, Baber U, Levine EJ, Croft LB, Henzlova MJ. A Model for the Prediction of a Successful Stress-First Tc-99m SPECT MPI. *J Nuc Cardiol* 2012. 19: 1124-1134. (Epub Sep 21, 2012)

21. Herman LK, Newman DH, Pleasant WA, Rojanasarntikul D, Lakoff D, Goldberg S, Duvall WL, Henzlova MJ. Yield of Routine Provocative Cardiac Testing Among Patients in an Emergency Department Based Chest Pain Unit. *JAMA Int Med* 2013. (Epub May 20, 2013)

22. Duvall WL, Guma KA, Kamen J, Croft LB, Parides M, George T, Henzlova MJ. Reduction in Occupational and Patient Radiation Exposure from Myocardial Perfusion Imaging: Impact of Stress-Only Imaging and High Efficiency SPECT Camera Technology. *J Nuc Med* 2013. (Epub May 20, 2013)

23 Duvall WL, Levine EJ, Moonthungal S, Fardanesh M, Croft LB, Henzlova MJ. A Hypothetical Protocol for the Provisional Use of Perfusion Imaging with Exercise Stress Testing. *J Nuc Cardiol* 2013. (Epub June 5, 2013)

24. Duvall WL, Slomka PJ, Gerlach JR, Sweeny JM, Baber U, Croft LB, Guma KA, George T, Henzlova MJ. High Efficiency SPECT MPI Comparison of Automated Quantification, Visual Interpretation, and Coronary Angiography. *J Nuc Cardiol* 2013. (Epub June 5, 2013)

REVIEW ARTICLES

1. Duvall WL, Croft LB, Goldman ME. Can HCED be extended for use by the non-cardiology medical community? *Echocardiography* 2003; 20: 471-476.

2. Duvall WL. Cardiovascular Disease in Women. *The Mount Sinai Journal of Medicine* 2003; 70: 293-305.

3. Duvall WL and Vorchheimer D. Multi-bed Vascular Disease and Atherothrombosis: Scope of the Problem. *Journal of Thrombosis and Thrombolysis* 2004; 17: 51-61.

4. Duvall WL. Endothelial Dysfunction and Antioxidants. *The Mount Sinai Journal of Medicine* 2005; 72: 71-80.

5. Duvall WL. Antithrombotic Therapy. *Cur Mol Med* 2006; 6: 603-619.

6. Henzlova MJ and Duvall WL. The Future of SEPCT MPI: Time and Dose Reduction. *J Nuc Cardiol* 2011. *J Nuc Cardiol* 2011; 18: 580-587.

7. Harrison S, Harrison M, Duvall WL. Stress Myocardial Perfusion Imaging in the Emergency Department. *Cur Cardiol Rev* 2012; 8: 116-122.

8. Slomka P, Dey D, Duvall WL, Henzlova MJ, Kaufman P, Berman DS, Germano G. Advances in Nuclear Cardiac Instrumentation with a View Towards Reduced Radiation Exposure. *Cur Card Reports* 2012; 14: 208-216.

BOOK CHAPTERS

1. Duvall WL and Vorchheimer D. Antithrombotic Therapy During the Acute Phase. *Atherothrombosis and Coronary Artery Disease,* 2nd Ed. Fuster V, Topol EJ, and Nabel EG, eds. Philadelphia, Lippincott William & Wilkins, 2005.

2. Duvall WL and Vorchheimer D. Antithrombotic Therapy Post Discharge. *Atherothrombosis and Coronary Artery Disease,* 2nd Ed. Fuster V, Topol EJ, and Nabel EG, eds. Philadelphia, Lippincott William & Wilkins, 2005.

3. Duvall WL, Vorchheimer D, and Fuster V. Thrombosis and Antithrombotic Therapy. *Hurst's The Heart*, 11th Ed. Fuster V *et al*, eds. Philadelphia, McGraw-Hill, 2004.

4. Duvall WL and Fischer A. Atrio-ventricular, Intraventricular, and Interventricular Dyssynchrony. *Textbook of Non-Invasive Cardiovascular Imaging*, 1st Ed. Garcia MJ ed. Lippincott, Williams, & Wilkins, 2009.

5. Henzlova MJ and Duvall WL. SPECT Radionuclide Myocardial Perfusion Imaging Protocols. *Nuclear Cardiology: Practical Applications*, 2nd Ed. Heller G and Hendel R, eds. McGraw-Hill, 2010.

6. Harrison M and Duvall WL. Valvular Heart Disease. *Handbook of Hospital Medicine*, 1st Ed. Klotman P, Kathuria N, and Dunn A, eds. World Scientific, 2012.

7. Harrison M and Duvall WL. Basic Valvular Echocardiography. *Bedside Ultrasound in Critical Care Medicine*, 1st Ed. Oropello J and Manasia T, eds. Springer, planned publication 2013.

ABSTRACTS

1. Duvall WL, Restifo KM, Moscovitz HC, Kiskaddon RT. The cost effectiveness of non-contrast helical computed tomography compared to intravenous pyelography in the initial evaluation of flank pain in the emergency department. *Academic Emergency Medicine* 1996; 3: 547 (Abstract).

2. Wakabayashi T, Travin MI, Antonopoulos G, *et al.* The effect of attenuation correction (AC) on the interpretation of stress myocardial perfusion imaging (MPI). *J Nuc Cardiol* 2003; 10: S18 (Abstract).

3. Duvall WL, Henzlova MJ, Croft LB, Goldman ME. Comparison between evaluation of left ventricular size and function by gated SPECT and hand carried ultrasound. *J Nuc Cardiol* 2003; 10: S26 (Abstract).

4. Duvall WL, Croft LB, Einstein AJ, *et al.* SPECT myocardial perfusion imaging in the morbidly obese: Image quality and hemodynamic response to pharmacological stress. *J Nuc Cardiol* 2004; 11: S16-17 (Abstract).

5. Duvall WL, Croft LB, Corriel JS, *et al.* SPECT myocardial perfusion imaging in the morbidly obese: Prognosis and diagnostic value. *J Nuc Cardiol* 2004; 11: S17 (Abstract).

6. Duvall WL, Sealove BA, Vilca R, Sharma SK, Kim MC. The safety of percutaneous coronary interventions prior to noncardiac surgery. *Circulation* 2004; 110 (Supplement): III-383 (Abstract).

7. Duvall WL, Croft LB, Pungoti C, Henzlova MJ. Does attenuation correction improve the interpretation of MPI in patients with LBBB? *J Nuc Cardiol* 2005; 12: S102 (Abstract).

8. Chalfoun NT, Fleischut P, Maddox TM, Duvall WL, Henzlova MJ. Stress only Tc-99m gated MIBI SPECT imaging: prognosis of a normal study. *J Nuc Cardiol* 2006; 13: S2 (Abstract).

9. Belanger AR, Croft LB, Duvall WL, Henzlova MJ. Determinants of the hemodynamic response to coronary vasodilators. *J Nuc Cardiol* 2006; 13: S3 (Abstract).

10. Duvall WL, Sealove B, Pungoti C, *et al.* Demand ischemia is the predominant etiology of perioperative myocardial infarction: Implications for perioperative risk stratification. *JACC* 2007; 49 (Supplement): 239A (Abstract).

11. Spektor G, Waller AH, Daraban N, Duvall WL, *et al.* Comparison of 64-slice computed tomography coronary angiography, radionuclide myocardial perfusion imaging and stress echocardiogram in the detection of significant coronary artery stenosis. *JACC* 2007; 49 (Supplement): 142A (Abstract).

12. Duvall WL, Hansalia RJ, Buckley S, *et al.* Advantage of optimizing V-V timing in CRT devices using three-dimensional echocardiography and aortic velocity time integral. *Heart Rhythm* 2007; 4 (Supplement): S387 (Abstract).

13. Duvall WL, Pungoti C, and Henzlova M. The need for risk reclassification due to the presence of pre-clinical disease in patients with positive ECG response to exercise and normal myocardial perfusion during stress. *J Nuc Cardiol* 2007; 14: S130 (Abstract).

14. Fischer A, Hansalia RJ, and Duvall WL. Lack of predictors of optimal RV-LV delay as established by three dimensional echocardiography and aortic velocity time intergrals. *J Cardiovasc Electrophysiol* 2007; 18: S32 (Abstract).

15. Duvall WL, Razzouk L, Chalfoun NT, and Henzlova MJ. The prognosis of a normal stress-only SPECT myocardial perfusion imaging study. *Circulation* 2007; 116 (Supplement): II-376 (Abstract).

16. Duvall W, Beniaminovitz A, Buckley S, *et al.* Poor reproducibility of echocardiographic measures of mechanical dyssynchrony in cardiac resynchronization therapy. *JACC* 2008; 51 (Supplement): A133-A134 (Abstract).

17. Nair AP, Hansalia R, Beniaminovitz A, *et al.* Velocity vector imaging accurately quantifies left ventricular mechanical dyssynchrony. *Heart Rhythm* 2008; 5 (Supplement): S280 (Abstract).

18. Duvall W, Krishnan M, Mann M, *et al.* The safety of Definity echocardiographic contrast. *J Am Society of Echocardiography* 2008; 21: 572 (Abstract).

19. Sweeny JM, Mozes J, Croft L et al. The utility of repeat SPECT myocardial perfusion imaging in patients with end stage liver disease. *J Nuc Cardiol* 2008; 15: S36-37 (Abstract).

20. Duvall W, Wijetunga M, Klein T, *et al.* The prognosis of normal stress-only SPECT myocardial perfusion imaging studies. *JACC* 2009; 53: A287 (Abstract).

21. Nelson BP, Parekh S, Hermann L, *et al.* Ultrasound lung comets and brain natriuretic peptide in acute dyspnea. *J Ultraound Med* 2009; 28: s43 (Abstract).

22. Wijetunga M, Duvall L, Klein T, *et al.* Clinical use of stress-first SPECT myocardial perfusion imaging studies in an emergency department chest pain unit. *Eur Heart J* 2009; 11 (Supplement B): S15. (Abstract).

23. Klein T, Duvall L, Wijetunga M, *et al.* Positive predictive value of stress-first SPECT myocardial perfusion imaging. *Eur Heart J* 2009; 11 (Supplement B): S17. (Abstract). (Abstract) ICNC-9 Barcelona.

24. Duvall L, Wijetunga M, Klein T, *et al.* The prognosis of normal stress-only SPECT myocardial perfusion imaging studies. *Eur Heart J* 2009; 11 (Supplement B): S92. (Abstract).

25. Hermann L, Weingart S, Yoon Y, *et al.* Typical angina is not predictive of the presence of inducible cardiac ischemia in emergency department chest pain patients. *Ann Emerg Med* 2009; 54: S8 (Abstract).

26. Duvall W, Wijetunga M, Hansalia R, *et al.* Advantage of optimizing V-V timing in cardiac resynchronization therapy devices. *Heart Rhythm* 2009; 6 (Supplement): S446 (Abstract).

27. Bander J, Krasner A, Duvall W, *et al.* Validation of real-time 3D echo derived volume/time curves by magnetic resonance imaging. *J Am Soc Echo* 2009; 22: 571 (Abstract).

28. Duvall W, Croft L, Buckley S, *et al.* Left ventricular dysfunction of aging despite preserved LVEF detected by 3D echocardiography. *Circulation* 2009; 120: s391 (Abstract).

29. Duvall W, Croft L, Zucker A, et al. Can Doppler echocardiography define diastolic heart failure? *Circulation* 2009; 120: s363 (Abstract).

30. Hansalia R, Duvall W, Buckely S, *et al.* A comparison of cardiac resynchronization therapy optimization using Quick Opt and echocardiographic parameters. *J Card Failure* 2009; 15: s59 (Abstract).

31. Duvall W, Croft L, Buckley S, *et al.* Left ventricular systolic and diastolic interdependence demonstrated by left ventricular emptying and filling rates. *JACC* 2010; 55: A89 (Abstract).

32. Duvall W, Croft L, Godiwala T, *et al.* Reduced isotope dose and rapid imaging SPECT MPI with excellent image quality. *JACC* 2010; 55: A90 (Abstract).

33. Croft L, McLaughlin M, Bander J, *et al.* First documentation of cardiac dysfunction following exposure to the world trade center disaster. *JACC* 2010; 55: A86 (Abstract).

34. Ginsberg E, Duvall W, *et al.* Reduced Isotope Dose and Imaging Time with High Speed CZT SPECT Camera. *JNC* 2010; 17: 741 (Abstract).

35. Hiensch R, Duvall W, *et al.* Relationship of Hemodynamic Changes After Dipyridamole, Adenosine, and Regadenoson Administration and Body Weight. (Abstract) *JNC* 2010; 17: 739 (Abstract).

36. Duvall W, Sweeny J, *et al.* Comparison of High Speed CZT SPECT MPI to Coronary Angiography. *Circulation* 2010; 122: A18672. (Abstract).

37. Duvall W, Levine A, Baber U, *et al.* Effective Evaluation of Patients in an Emergency Department Chest Pain Unit with Myocardial Perfusion Imaging. *Eur Heart J* 2011; 13 (Supplement A): A49. (Abstract).

38. Duvall W, Sweeny J, Croft L, *et al.* Comparison of High Efficiency CZT SPECT MPI to Coronary Angiography. *Eur Heart J* 2011; 13 (Supplement A): A80-81. (Abstract).

39. Duvall W, Levine E, Baber U, *et al.* Effective Evaluation of Patients in an Emergency Department Chest Pain Unit with Myocardial Perfusion Imaging. *JACC* 2011; 57: E749 (Abstract).

40. Krasner A, Bander J, Duvall W, *et al.* Real-Time 3D Echo Generated Volume/Time Curves: Comparison to Magnetic Resonance Imaging and Interobserver Correlation. *JACC* 2011; 57: E857. (Abstract).

41. Hiensch R, Duvall W, Croft L, Henzlova M. Normal Tl-201 Stress-Only SPECT MPI. *J Nuc Cardiol* 2011; 18: 771-772. (Abstract).

42. Duvall W, Baber U, Levine E, *et al.* A Model for Determination of the Appropriateness of a Stress-First Tc-99m SPECT MPI. *J Nuc Cardiol* 2011; 18: 778-779. (Abstract).

43. Guma K, Duvall W, Kamen J, et al. Reduction in Occupational Radiation Exposure Using a CZT Camera for Myocardial Perfusion Imaging. *JACC* 2012; 59: E1317 (Abstract).

44. Duvall W, Levine E, Moonthungal S, *et al.* A Protocol for the Provisional Use of Perfusion Imaging in Exercise Stress. *J Nuc Cardiol* 2012; 19: 833. (Abstract).

45. Duvall W, Slomka P, Gerlach J, *et al.* Automated Quantification of High-Efficiency CZT SPECT MPI Compared to Clinical Interpretation. *J Nuc Cardiol* 2012; 19: 840. (Abstract).

46. Duvall W, Naib T, Greco G, *et al.* Cost Savings Associated with the Use of Selective Stress-Only and CZT SPECT Myocardial Perfusion Imaging. *J Nuc Cardiol* 2012; 19: 863. (Abstract).

47. Duvall W, Savino J, Levine E, *et al.* Radiation Dose and Downstream Testing from Coronary CT Angiography (CTA) versus SPECT Myocardial Perfusion Imaging (MPI) for the Evaluation of Chest Pain in the Emergency Department (ED). *Circulation* 2012, 126: A17862. (Abstract).

48. Henzlova M, Songy B, Jager PL, *et al.* Diversity of High-Efficiency CZT SPECT Tc-99m Imaging Protocols: Results of an International Survey. *J Nuc Cardiol* 2013; 20: S8 (Abstract).

49. Henzlova M, Levine EJ, Moonthungal S, *et al.* A Protocol for the Provisional Use of Perfusion Imaging with Exercise Stress Testing. *J Nuc Cardiol* 2013; 20: S9 (Abstract).

50. Henzlova M, Savino J, Levine EJ, *et al.* Radiation Dose and Downstream Testing from Coronary CT Angiography Compared to Stress Testing Using High-Efficiency SPECT MPI for the Evaluation of Chest Pain in the Emergency Department. *J Nuc Cardiol* 2013; 20: S71 (Abstract).

51. Henzlova M, Naib T, Greco G, *et al.* Cost Savings Associated with the Use of Selective Stress-Only and CZT SPECT Myocardial Perfusion Imaging. *J Nuc Cardiol* 2013; 20: S57 (Abstract).

52. Henzlova M, Savino J, Levine E, *et al.* Comparative Effectiveness of Coronary CT Angiography Versus Stress Testing Using High-Efficiency SPECT Myocardial Perfusion Imaging and Stress-Only Imaging in the Emergency Department. *JACC* 2013, 61: E847. (Abstract).

53. Savino JA, Duvall WL, Levine EJ, *et al.* Prospective Evaluation of the Provisional Use of Perfusion Imaging with Exercise Stress in the Emergency Department. *J Nuc Cardiol* 2013; 20: 670 (Abstract).

54. Levine EJ, Savino JA, Duvall WL, *et al.* Clinical Outcomes of Stress-First Myocardial Perfusion Imaging Studies. *J Nuc Cardiol* 2013; 20: 682-683 (Abstract).

55. Guma KA, Duvall WL, Fernandes V, *et al.* Initial Experience with SPECT Gated Blood Pool Scans Using a High-Efficiency SPECT Camera. *J Nuc Cardiol* 2013; 20: 659-660 (Abstract).

EDITORIALS

1. Duvall WL and Nash IS. Exercise, Physical Fitness, and Longevity. *Hurst's The Heart* Online Edition, The McGraw-Hill Companies. 2002.

2. Duvall WL and Nash IS. Too Thin or Not Too Thin (WARIS II). *Hurst's The Heart* Online Edition, The McGraw-Hill Companies. 2002.

3. Hansalia RJ, Duvall WL, and Mehta D. Predicting and Optimizing Response to Cardiac Resynchronization Therapy Beyond QRS Duration: Expanding Role of Echocardiography. *Indian Heart J* 2007; 59: 207-210.

4. Henzlova MJ, Croft LB, and Duvall WL. Stress-Only Imaging: Faster, Cheaper, Less Radiation. So What's the Hold Up? J Nucl Cardiol 2012. Nov 15 (Epub ahead of print)

INVITED CONTRIBUTIONS

1. Author of Monthly Column "New Therapy Update" in *Cardiovascular Reviews & Reports*

January 2003	Zetia (ezetimibe)
February 2003	Remodulin (treprostinil sodium)
March 2003	Inspra (eplerenone)
April 2003	Tevetan (eprosartan mesylate)
May 2003	InnoPran XL (propranolol hydrochloride)
June 2003	Coreg (carvedilol)
July 2003	Cypher (sirolimus-eluting coronary stent)

August 2003	Lescol XL (fluvastatin sodium)
September 2003	Cardizem LA (diltiazem hydrochloride)
October 2003	Pavigard PAC (buffered aspirin and pravastatin sodium)
Nov/Dec 2003	Crestor (rosuvastatin calcium)
Jan/Feb 2004	Contak System (cardiac resynchronization therapy defibrillator)
March/April 2004	Influenza Vaccine
May/June 2004	Caduet (amlodipine besylate/atorvastatin calcium)
July/Aug 2004	Taxus (paclitaxel-eluting coronary stent)
Sept/Oct 2004	Vytorin (ezetimibe/simvastatin)
Nov/Dec 2004	Exanta (ximelagatran)

INVITED LECTURES/PRESENTATIONS

2004 Medicine Grand Rounds
April 4th - Morbidity and Mortality Review on Balloon Aortic Valvuloplasty

2006 Cardiology Grand Rounds
April 17th - Update on Nuclear Cardiology Research

2006 Cardiology Grand Rounds
June 19th - Update on Mitral Valve Disease

2006 CV-MAP National Faculty
Cardio**V**ascular Issues in **M**anaging **A**rthritis **P**ain CME Program

2006 Cardiology Grand Rounds
October 9th – Cardiac Resynchronization Therapy

2011 Cardiology Grand Rounds
April 18th – Nuclear Cardiology 2011

2012 Hospital Medicine Grand Rounds
February 9th – Stress Testing

2012 Cardiology Grand Rounds
October 22nd – Nuclear Cardiology Update

RESEARCH EXPERIENCE

1994 ***Princeton Senior Thesis***
"Reverse Transcription-Polymerase Chain Reaction for the Detection of *LacZ* mRNA In Enhancer Trap Transformant Strains of *Polysphondylium pallidum*"

1998 ***Yale M.D. Thesis***

"The Cost Effectiveness of Non-contrast Helical Computed Tomography Compared to Intravenous Pyelography in the Initial Evaluation of Flank Pain in the Emergency Department"

- April 1996 - Oral Presentation at Society of Academic Emergency Medicine Annual Meeting in Denver, CO
- April 1996 - Abstract Published in *Academic Emergency Medicine* 1996; 3: 547
- October 1996 - Oral Presentation at American College of Physicians Connecticut Chapter Annual Meeting

CLINICAL TRIALS

2004-06 ***CVT 5132 Trial***

"A Phase III, Randomized, Double-Blind Study of Intravenous CVT-3146 vs. Adenoscan in Patients Undergoing Stress Myocardial Perfusion Imaging"

- Site Co-Investigator for Multicenter Study

2005-08 ***GE MIBG 312 Heart Failure Study***

"Open-Label, Multicentre, Phase 3 Study Evaluating the Prognostic Usefulness of ^{123}I-mIBG Scintigraphy for Identifying Subjects with Heart Failure who will Experience an Adverse Cardiac Event"

- Site Co-Investigator for Multicenter Study

2006- ***Genzyme Niemann Pick Type B Enzyme Replacement Study***

"Phase 1 Clinical Trial of Enzyme Replacement in Niemann Pick Disease"

- Cardiology Primary Investigator for Study

2006-07 ***King VISION 305 Study***

"Vasodilator Induced Stress in Concordance with Adenosine, a Phase III, Randomized, Double-Blind Multi-Center Study"

- Site Primary Investigator for Multicenter Study

2007-08 ***Molecular Insight MIP-BP23 Study***

"Open-Label, Phase 2 Study of the Safety and Efficacy of B-Methyl-P-^{123}I-Iodophenyl-Pentadeconoic Acid (Iodofiltic Acid I 123) for Identification of Ischemic Myocardium Using Single Photon Emission Computed Tomography (SPECT) in Adults with Symptoms Consistent with Acute Coronary Syndrome (ACS)"

- Site Co-Investigator for Multicenter Study

2010- ***Genzyme GZGD03109 Study***

"A Phase 3, Randomized, Multi-Center, Multi-National, Double-Blind Study to Evaluate the Efficacy, Safety, and Pharmacokinetics of Once Daily versus Twice Daily Dosing of Genz-112638 in Patients with Gaucher Disease Type 1 who have Demonstrated Clinical Stability on a Twice Daily Dose of Genz-112638"

- Cardiology Co-Investigator for Study

2010- ***Genzyme GZGD02507 Study***

"A Phase 3, Randomized, Double-Blind, Placebo-Controlled, Multi-Center Study Confirming the Efficacy and Safety of Genz-112638 in Patients with Gaucher Disease Type 1"

• Cardiology Co-Investigator for Study

2011-12 ***GE 078-101 Study***

"An Open-Label, Multicenter, Proof of Concept, Phase 2 Study Evaluating the Results of Tc99m-Maraciclatide Scintigraphy in subjects with Diabetes Mellitus and Heart Failure with Preserved Left Ventricular Ejection Fraction"

• Site Co-Investigator for Multicenter Study

2011- ***BMS 747158-301 Study***

"A Phase 3, Open-Label, Multicenter Study for the Assessment of Myocardial Perfusion Using Positron Emission Tomography Imaging of Flurpiridaz F-18 Injection in Patients with Suspected or Known Coronary Artery Disease"

• Site Co-Investigator for Multicenter Study

2012- ***Synageva BioPharma Corp. Study***

"An Open Label, Multicenter Extension Study to Evaluate the Long-Term Safety, Tolerability and Efficacy of SBC-102 in Adult Subjects with Liver Dysfunction Due to Acid Lipase Deficiency who Previously Received Treatment in Study LAL-CL01"

• Site Co-Investigator for Multicenter Study

2013- ***TURBULENCE Study***

"Clinical Evaluation of the Cadence® Device in Detection of Coronary Artery Disease"

• Site Co-Investigator for Multicenter Study

INTERESTS

Sailing, mountain biking, ice hockey

April Mann, BA, CNMT, NCT, RT (N)
Curriculum Vitae

Home Address: 47 Hadley Village Road, South Hadley, MA 01075

Business Address: Hartford Hospital
80 Seymour Street
Hartford, Connecticut 06102

Home Telephone: (413) 533-6158
Business Telephone: (860) 545-5531
Fax: (860) 545-5631

E-mail Address: april.mann@hhchealth.org (work)
aprilmann423@gmail.com (home)

Previous name used: Schaarschmidt

Education

Springfield Technical Community College, Springfield, Massachusetts
Associates of Science Degree, Nuclear Medicine Technology 1989

Elms College, Chicopee, Massachusetts.
Bachelors Degree of Arts, Health Care Management 2002

BayPath College, Longmeadow, Massachusetts
MBA, Entrepreneurial Thinking and Innovative Practices – pending completion 2013

Awards

John W. Turner Award, Springfield Technical Community College May 1988

1st Place, Cardiovascular Council Award, Technologist Papers, 47th Annual Society of Nuclear Medicine Meeting, St. Louis, Missouri, June 2000.

2nd Place, Cardiovascular Council Award, Technologist Papers, 47th Annual Society of Nuclear Medicine Meeting, St. Louis, Missouri, June 2000.

2nd Place, Cardiovascular Council Award, Technologist Papers, 48th Annual Society of Nuclear Medicine Meeting, Toronto, Canada, June 2001.

Fellowship Award, Society of Nuclear Medicine Technologist Section, 49th Annual Society of Nuclear Medicine Meeting, Los Angeles, California June 2002.

Service Award, New England Chapter Society of Nuclear Medicine Technologist Section, 35 Annual Spring Symposium, New England Chapter Technologist Section, Braintree, Massachusetts, March 2004.

Fellowship Award, American Society of Nuclear Cardiology January 2006

Affiliations and Certifications

Society of Nuclear Medicine and Molecular Imaging *(since 1993)*
New England Chapter, Society of Nuclear Medicine *(since 1993)*
American Society of Nuclear Cardiology *(since, 1996)*
Nuclear Medicine Technology Certification Board (*1989*) *#012417*
American Registry of Radiological Technology (Nuclear Medicine) *(1989) #236554*
Nuclear Cardiology Technologist, NMTCB *(2001) #C80004*
Basic Life Support (Healthcare Provider)
Alpha Sigma Lambda National Honor Society *(inducted April 2002)*
Honored Lifetime Member, Strathmore's Who's Who *(inducted edition 2003- 2004)*

Experience

1989-1990	**Charlotte Hungerford Hospital**, Torrington, Connecticut Staff Technologist, Nuclear Medicine Laboratory
1990- 1991	**Providence Hospital,** Holyoke, Massachusetts Clinical Supervisor, Nuclear Medicine Laboratory
1991-1994	**Hartford Hospital,** Hartford, Connecticut Staff Technologist, Clinical Nuclear Medicine
1992- 2000	**Hartford Hospital**, Hartford Connecticut Clinical Instructor**,** Springfield Technical Community College, Springfield Massachusetts
1994-1996	**Hartford Hospital**, Hartford, Connecticut Staff Technologist, Nuclear Cardiology Laboratory
1996- 2000	**Hartford Hospital**, Hartford, Connecticut Clinical Supervisor, Nuclear Cardiology Laboratory
2000-2001	**Hartford Hospital**, Hartford, Connecticut Manager, Nuclear Cardiology Laboratory

2001- 2008	**Hartford Hospital**, Hartford, Connecticut Manager, Non-Invasive Cardiology
2008 – 2009	**Hartford Hospital**, Hartford, Connecticut Manager, Non-Invasive Cardiology and Clinical Nuclear Medicine
2009- present	**Hartford Hospital**, Hartford, Connecticut Manager, Non-Invasive Cardiology

Appointments

1996- 1998	Grassroots Chairperson, Greater Hartford Area. Technologist Section, New England Chapter, Society of Nuclear Medicine.
1997- 2000	Co-Editor, Technologists' Section, Journal of Nuclear Cardiology
1997- 2001	Membership Committee, American Society of Nuclear Cardiology
1997- 2004	Technologist Committee, American Society of Nuclear Cardiology
1997 – 2004	Socio-Economic Affairs Committee, Technologist Section, Society of Nuclear Medicine (Chair, 2001-2003)
1997 – 2004	Nuclear Cardiology Committee, Technologist Section, Society of Nuclear Medicine (Chair 2000-2001)
1997 -1998	Co-Chair, Spring Symposium Committee, New England Chapter Technologist Section, Society of Nuclear Medicine
1997 - 1999	Item-Writer, American Registry of Radiologic Technologists
1998 – 2004	Scientific and Teaching Committee, Technologist Section, Society of Nuclear Medicine (2003 –2004 Continuing Education Vice-Chair)
1998 – 2000	Continuing Education Committee, Technologist Section, Society of Nuclear Medicine
1998 - 1999	President-elect, New England Chapter, Technologist Section, Society of Nuclear Medicine
1998 - 1999	Chair, Spring Symposium Committee, New England Chapter Technologist Section, Society of Nuclear Medicine
1998 - 1999	4th ASNC Tutorial Committee, American Society of Nuclear Cardiology

1999 – 2000	President, New England Chapter, Technologist Section, Society of Nuclear Medicine
1999 – 2000	Chair, New Millennium Subcommittee, Socio-Economic Affairs Committee, Technologist Section, Society of Nuclear Medicine
1999 – 2000	Membership Committee, Technologist Section, Society of Nuclear Medicine
1999 – 2004	Strategic Planning Committee, Technologist Section, Society of Nuclear Medicine
1999 – 2002	Awards Committee, Technologist Section, Society of Nuclear Medicine
1999 – 2000	Chapter Presidents Committee, Technologist Section, Society of Nuclear Medicine
1999 - 2004	Leadership and Mentoring Committee, Technologist Section, Society of Nuclear Medicine
1999 - 2000	5th ASNC Symposium and Scientific Session, American Society of Nuclear Cardiology
1999 – 2006	Board of Directors, Cardiovascular Council, Society of Nuclear Medicine (Secretary/Treasurer 2002- 2004) (Secretary 2004 – 2006)
1999 – 2001	Nuclear Medicine Week Subcommittee, Technologist Section, Society of Nuclear Medicine
2000 – 2001	Section Editor, Technologists' Section, Journal of Nuclear Cardiology
2000 - 2001	Immediate Past President, New England Chapter Technologist Section, Society of Nuclear Medicine
2000 – 2001	Chair, Nominating Committee, New England Chapter, Society of Nuclear Medicine
2000 – 2003	Service Award Committee, New England Chapter, Society of Nuclear Medicine (Chair 2000 – 2001)
2000 – present	Past Presidents Council, New England Chapter, Society of Nuclear Medicine (Chair 2000 – 2001)
2000 - 2001	Executive Board Member at Large, Technologist Section, Society of Nuclear Medicine.

2000 – 2008	Publications Committee, Technologist Section, Society of Nuclear Medicine.
2000 – 2001	Academic Affairs Committee, Technologist Section, Society of Nuclear Medicine
2000 – present	Administrator, New England Chapter, Society of Nuclear Medicine
2000	Member, Coalition for Allied Health Leadership, Health Professions Network, Society of Nuclear Medicine
2000 – 2004	Technologist Advisory Board, Bristol-Myers Squibb Medical Imaging, N. Billerica, Massachusetts
2000 – 2002	Coalition on Allied Health Task Force, Technologist Section, Society of Nuclear Medicine
2000 – present	Application Reviewer, Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories
2001 – present	Site Inspector, Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories
2001 – 2003	Allied Health Professionals Committee, American College of Cardiology
2001 – 2004	Finance Committee, Technologist Section, Society of Nuclear Medicine (Chair: 2003 – 2004)
2001 – 2002	Coding and Reimbursement Committee, Society of Nuclear Medicine
2001 – present	Education Committee, American Society of Nuclear Cardiology
2001- 2002	Technologist Task Force, American Society of Nuclear Cardiology
2002 – 2006	Associate Editor, Editorial Board, Journal of Nuclear Medicine Technology
2002 – 2009	Board of Directors, Nuclear Medicine Technology Certification Board (Secretary 2005, Chair-elect 2007, Chair 2008)
2002	Planning Committee, March 2003 Cardiovascular Administrators' Management Conference, American College of Cardiology Administrators, AAMA
2002 – 2004	Government Relations Committee, Committee, American Society of Nuclear Cardiology

2002 – 2003	Audits Committee, Society of Nuclear Medicine
2002 - 2004	Investments Subcommittee of Finance, Society of Nuclear Medicine
2002 – 2003	Membership Committee, Society of Nuclear Medicine
2002 – 2003	Ethics Sub-Committee, Society of Nuclear Medicine
2002 - 2003	8th Annual ASNC Symposium and Scientific Session Committee, American Society of Nuclear Cardiology
2003	Planning Committee, Annual 2003 American Academy of Medical Administrator's Conference Cardiovascular Session, San Antonio, TX.
2002 – present	Co-Program Director, Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology
2003 – 2004	Executive Board Member (Finance Chair), Society of Nuclear Medicine Technologist Section
2003	Planning Committee, March 2004 Cardiovascular Administrators' Management Conference, American College of Cardiology Administrators, AAMA
2003 - 2004	9th Annual ASNC Symposium and Scientific Session Committee, American Society of Nuclear Cardiology
2003 – 2006	Finance Committee, Society of Nuclear Medicine
2003 – 2006	Scientific Program Committee, Society of Nuclear Medicine
2004 – 2006	Reimbursement Task Force, Society of Nuclear Medicine
2004 – 2006	Program Committee, Society of Nuclear Medicine Technologist Section (Chair-elect 2004-2005, Chair 2005-2006)
2004 – 2006	Advocacy Committee, Society of Nuclear Medicine Technologist Section
2004 – 2006	Task Force on Emerging Technologies Committee, Society of Nuclear Medicine Technologist Section
2004 – 2006	Professional Development Task Force, Society of Nuclear Medicine Technologist Section

2004	Planning Committee, March 2005 Cardiovascular Administrators' Management Conference, American College of Cardiology Administrators, AAMA.
2003 - 2004	10th Annual ASNC Symposium and Scientific Session Committee, American Society of Nuclear Cardiology
2005	Planning Committee, March 2006 Cardiovascular Administrators' Management Conference, American College of Cardiology Administrators, AAMA
2005 – 2010	Board of Directors, Intersocietal Commission of Accredited Nuclear Laboratories
2005 – 2006	Finance Committee, Technologist Section, Society of Nuclear Medicine
2005 - 2006	11th Annual ASNC Symposium and Scientific Session Committee, American Society of Nuclear Cardiology
2005 – 2006	Bylaws Committee, Society of Nuclear Medicine
2005 – 2006	Ethics Committee, Society of Nuclear Medicine
2005 – 2007	PET/CT Technologist Education Task Force (Chair, 2005)
2005 – 2006	Committee on Healthcare Policy, Society of Nuclear Medicine
2005 – 2007	Program Director, Diagnostic and Interventional Symposium for the Cardiac Imaging Professional
2006 – 2009	Board of Directors, American Society of Nuclear Cardiology
2006 – 2008	Publications Committee, Technologist Section Society of Nuclear Medicine
2009 – 2010	Planning Committee, ASNC 2010, American Society of Nuclear Cardiology
2009 – 2011	Steering Committee on Education, American Society of Nuclear Cardiology
2010 – present	Health Policy Resource Group, American Society of Nuclear Cardiology
2010	Task Force on Laboratory Reaccreditation, American Society of Nuclear Cardiology

2010 – present	Finance Committee, Technologist Section Society of Nuclear Medicine and Molecular Imaging (Chair, 2012 – 2013)
2010 – present	Membership Committee, Technologist Section Society of Nuclear Medicine
2010 – present	Executive Committee, New England Chapter Technologist Section, Society of Nuclear Medicine (President-elect, 2010 – 2011, President, 2012 – 2013, Past President 2013 - 2014)
2010 – 2011	Planning Committee, ASNC 2011, American Society of Nuclear Cardiology
2011 – 2012	Planning Committee, ASNC 2012, American Society of Nuclear Cardiology
2012 – present	Finance Committee, Society of Nuclear Medicine and Molecular Imaging
2012 – present	Investments Sub-committee, Society of Nuclear Medicine and Molecular Imaging
2012 – present	Board of Directors, Society of Nuclear Medicine and Molecular Imaging Technologist Section (Finance Chair 2012 – 2013, President-elect 2013 – 2014)
2012 – present	National Council Delegates, Society of Nuclear Medicine and Molecular Imaging Technologist Section (Finance Chair 2012 – 2013, President-elect 2013 – 2014)

Presentations

February 18, 1996	"Gated SPECT Imaging: Perfusion and Clinical Data." 19th Annual Mid-Winter Meeting, New England Chapter, Society of Nuclear Medicine, North Conway, New Hampshire.
April 25, 1996	"Pharmacologic Stress." Annual Respiratory Therapy Symposium, Waterbury, Connecticut
February 16, 1997	"Technical Considerations for Acute Myocardial Perfusion Imaging." 20th Annual Mid-Winter Meeting, New England Chapter, Society of Nuclear Medicine, Jackson, New Hampshire.
September 13, 1997	"Technical Considerations in Image Acquisition." 2nd Annual Tutorial in Nuclear Cardiology, American Society of Nuclear Cardiology, Boston, Massachusetts.
October 25, 1997	"Acute Imaging-Technical Considerations." 11th Northeast Regional Society of Nuclear Medicine Meeting, Rye Brook, New York.

January 17, 1998	"Gated SPECT Imaging for the Technologist." Pharmacologic Stress Imaging 1998: Changing Concepts and Read with the Experts, American Society of Nuclear Cardiology, New York, New York.
February 15, 1998	"Sources of Error in Acquisition of Myocardial Perfusion Imaging- A Case Review." 21st Annual Mid-Winter Meeting, Society of Nuclear Medicine, Jackson, New Hampshire.
April 24, 1998	"Technical Consideration for Acute Myocardial Perfusion Imaging" North Carolina Society of Nuclear Medicine Meeting, Wilmington, North Carolina.
June 09, 1998	"Gated SPECT" 45th Annual Society of Nuclear Medicine Meeting, Toronto, Canada.
August 22, 1998	"Technical Considerations of Image Acquisition in SPECT Myocardial Perfusion Imaging." New Jersey Society of Nuclear Medicine, Teaneck, New Jersey
August 29, 1998	"Gated SPECT Imaging for the Technologist" New England Chapter Technologist Section, Society of Nuclear Medicine, New Hampshire Summer Grassroots Meeting. Yarmouth, Nova Scotia.
September 19, 1998	"Gated SPECT Imaging for the Technologist" New England Chapter Technologist Section, Society of Nuclear Medicine, Vermont Grassroots Meeting. Burlington, Vermont
May 8, 1999	"Gated SPECT Imaging for the Technologist" New England Chapter Technologist Section, Society of Nuclear Medicine, Maine Grassroots Meeting. Augusta, Maine.
June 5, 1999	"Technical Considerations of Image Acquisition in SPECT Myocardial Perfusion Imaging." 46th Annual Society of Nuclear Medicine Meeting, Los Angeles, California.
June 8, 1999	"Laboratory Logistics at Hartford Hospital." 46th Annual Society of Nuclear Medicine Meeting, Los Angeles, California.
November 13, 1999	"Building Blocks of the Technologist Section Society of Nuclear Medicine" New England Chapter, Vermont Grassroots Meeting, Burlington, Vermont.
March 31, 2000	"Nuts and Bolts of Gated SPECT Imaging" 45th Annual Southwest Chapter Society of Nuclear Medicine Meeting. Galveston, Texas

April 1, 2000	"Acute Myocardial Perfusion Imaging" 45th Annual Southwest Chapter, Society of Nuclear Medicine Meeting. Galveston, Texas
April 8, 2000	"Sensitivity, Specificity and Accuracy of Cardiac SPECT" 29th Annual Spring Symposium, Greater New York Chapter Technologist Section, Atlantic City, New Jersey.
May 5, 2000	"Review of AutoQuant™ and Vantage™ Attenuation Correction" ADAC/Du Pont User's Meeting, Tampa, Florida
June 5, 2000	"Correcting Common Artifacts at Hartford Hospital, Nuclear Cardiology Laboratory" 47th Annual Society of Nuclear Medicine Meeting, St. Louis, Missouri.
Sept. 23, 2000	"Acquisition: Challenges and Solutions." 5th Annual American Society of Nuclear Cardiology Symposium and Scientific Session. Chicago, Illinois.
Nov. 4, 2000	"Nuclear Cardiology: Acquisition Challenges and Solutions." 14th Annual Northeast Regional Scientific Meeting. New England and Greater New York Chapter of the Society of Nuclear Medicine. Newport, Rhode Island.
Dec 12, 2000	"Nuclear Cardiology Laboratory Accreditation" DuPont Pharmaceuticals, Al Dente Ristorante, Piscataway, New Jersey
Dec 14, 2000	"Nuclear Cardiology Laboratory Accreditation" Du Pont Pharmaceuticals, High Lawn Pavilion, West Orange, New Jersey
February 10, 2001	"Protocols: Parameters and Technical Considerations" Mid-Winter Meeting Educational Symposium, Society of Nuclear Medicine. Tampa, Florida
February 27, 2001	"Nuclear Cardiology Laboratory Accreditation" Du Pont Pharmaceuticals, The Grande Cafe, Morristown, New Jersey
April 19, 2001	"Technical Consideration for Myocardial Perfusion Imaging" 32nd Annual Spring Symposium, New England Chapter Technologist Section, Society of Nuclear Medicine. Hartford Marriott Farmington, Farmington, Connecticut.
April 20, 2001	"Nuclear Cardiology Laboratory Accreditation" 32nd Annual Spring Symposium, New England Chapter Technologist Section, Society of Nuclear Medicine. Hartford Marriott Farmington, Farmington, Connecticut.

May 5, 2001 "Myocardial Perfusion Imaging: The Good, the Bad and the Ugly." Florida Nuclear Medicine Technologists' Annual Meeting. Wyndham Harbourside, Tampa, Florida.

June 23, 2001 "Mastering the Meeting" Emerging Leaders Conference, 48th Annual Society of Nuclear Medicine Meeting, Toronto, Canada.

June 23, 2001 "Optimizing Display and Interpretation" Nuclear Cardiology 2001: Improving Image Quality – Read with the Experts, 48th Annual Society of Nuclear Medicine Meeting, Toronto, Canada.

October 6, 2001 "Protocols: Parameters and Technical Considerations" North Carolina Nuclear Medicine Technologist Fall Meeting. Raleigh Durham, North Carolina.

October 6, 2001 "Application of Gated SPECT" North Carolina Nuclear Medicine Technologist Fall Meeting. Raleigh Durham, North Carolina.

November 3, 2001 "Myocardial Perfusion Imaging: The Good, the Bad and the Ugly." Continuum 2001: Nuclear cardiology and Latest Updates. Southern Michigan Associates and Technical Affiliates. William Beaumont Hospital, Royal Oak, Michigan.

February 16, 2002 "Nuts and Bolts of Gated SPECT Imaging" Technologist Tutorial American Society of Nuclear Cardiology, Houston Texas.

February 16, 2002 "Stress Testing" Technologist Tutorial American Society of Nuclear Cardiology, Houston Texas.

March 2, 2002 "Nuts and Bolts of Gated SPECT Imaging" Technologist Tutorial American Society of Nuclear Cardiology, George Washington University, Washington, D.C.

March 2, 2002 "Stress Testing" Technologist Tutorial, American Society of Nuclear Cardiology, George Washington University, Washington, D.C.

April 6, 2002 "Nuts and Bolts of Gated SPECT Imaging" Technologist Tutorial, American Society of Nuclear Cardiology, Kansas City, Missouri.

April 6, 2002 "Stress Testing" Technologist Tutorial American Society of Nuclear Cardiology, Kansas City, Missouri.

April 13, 2002 "Choosing the Best Imaging Protocol" Combined Northeast ASNC Working Groups Meeting. New York Marriott Marquis, New York, New York.

May 3, 2002 "Technical Consideration of Myocardial Perfusion Imaging" 31st Annual Spring Symposium, Greater New York Chapter Technologist Section, Society of Nuclear Medicine. Franklin Wyndham Hotel, Philadelphia, Pennsylvania.

May 4, 2002 "Myocardial Perfusion Imaging: the Good the Bad and the Ugly" Florida Nuclear Medicine Technologists 2002 Annual Meeting, Orlando, Florida.

May 15, 2002 "Myocardial Perfusion Imaging: the Good the Bad and the Ugly" Nuclear Medicine Technologist Section of the Society of Nuclear Medicine of Puerto Rico. San Juan, Puerto Rico.

May 16, 2002 "Myocardial Perfusion Imaging: the Good the Bad and the Ugly" Nuclear Medicine Technologist Section of the Society of Nuclear Medicine of Puerto Rico. Ponce, Puerto Rico.

September 12, 2002 "Imaging Protocols and Parameters" Nuclear Cardiology Board Review Coarse, Southeast Chapter Annual Meeting, Orlando, Florida.

September 28, 2002 "Acute Chest Pain Imaging in Your Emergency Department" 7th Annual ASNC Symposium and Scientific Session, Baltimore, Maryland.

October 17, 2002 "Cardiac SPECT Processing: Parameters and Techniques" 27th Annual Nuclear Cardiology Symposium and Workshop. Wyndham Milwaukee Center Hotel, Milwaukee, Wisconsin

October 17, 2002 "Imaging Artifacts and Errors: Challenges and Solutions" 27th Annual Nuclear Cardiology Symposium and Workshop. Wyndham Milwaukee Center Hotel, Milwaukee, Wisconsin.

April 12, 2003 "The Ins and Out's of the NMTCB Nuclear Cardiology Specialty Exam. 34th Annual Spring Symposium, New England Chapter Technologist Section, Society of Nuclear Medicine. Eastland Hotel Portland, Maine.

May 3, 2003 "Identification and Prevention of Common Artifacts in Nuclear Cardiology" 32nd Annual Spring Symposium, Greater New York Chapter Technologist Section, Society of Nuclear Medicine. Wyndham Philadelphia at Franklin Plaza, Philadelphia, Pennsylvania.

May 3, 2003 "The NMTCB Nuclear Cardiology Specialty Exam" 32nd Annual Spring Symposium, Greater New York Chapter Technologist Section, Society of Nuclear Medicine. Wyndham Philadelphia at Franklin Plaza, Philadelphia, Pennsylvania.

May 13, 2003 "Acquisition and Processing of Attenuation Correction from a Technologist Point of View." Philips (ADAC) Users' Meeting on Attenuation Correction. Marriott LaGuardia, New York, New York.

May 17, 2003 "Disease Processes of the Heart" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology. Hyatt Arlington, Arlington, Virginia.

May 17, 2003 "Pharmacologic Stress Testing" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology. Hyatt Arlington, Arlington, Virginia.

May 18, 2003 "Performing Effective Imaging Protocols" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology. Hyatt Arlington, Arlington, Virginia.

May 18, 2003 "Processing Parameters: Techniques and Considerations" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology. Hyatt Arlington, Arlington, Virginia.

May 18, 2003 "Overview of Gamma Camera Quality Control" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology. Hyatt Arlington, Arlington, Virginia.

June 21, 2003 "Stress Protocols – Exercise versus Pharmacological" 50th Annual Society of Nuclear Medicine Meeting, New Orleans, Louisiana

June 21, 2003 "Read with the Experts – Understanding and Interpreting the Images" 50th Annual Society of Nuclear Medicine Meeting, New Orleans, Louisiana

June 22, 2003 "ICANL Accreditation Workshop" 50th Annual Society of Nuclear Medicine Meeting, New Orleans, Louisiana

June 23, 2003 "Advances in Pharmacologic Stress Myocardial Perfusion Imaging" 50th Annual Society of Nuclear Medicine Meeting, New Orleans, Louisiana

June 23, 2003 "Optimizing Acquisition Parameters and Imaging Protocols" 50th Annual Society of Nuclear Medicine Meeting, New Orleans, Louisiana

June 24, 2003 "The Development of the NMTCB-NCT Specialty Exam" 50th Annual Society of Nuclear Medicine Meeting, New Orleans, Louisiana

September 11, 2003 "Writing: How Do I Begin?" Professional Development Session, 8th Annual symposium and Scientific Session, American Society of Nuclear Cardiology, Indianapolis, Indiana

September 12, 2003 "Artifacts in SPECT Perfusion and Function" Core Session, 8th Annual symposium and Scientific Session, American Society of Nuclear Cardiology, Indianapolis, Indiana

September 12, 2003 "Philips How to Session: Attenuation Correction," 8th Annual symposium and Scientific Session, American Society of Nuclear Cardiology, Indianapolis, Indiana.

October 24, 2003 "Processing Nuclear Cardiology Studies" 28th Annual Nuclear Cardiology Symposium and Workshop. Wyndham Milwaukee Center Hotel, Milwaukee, Wisconsin.

October 24, 2003 "Practicing Nuclear Cardiology" 28th Annual Nuclear Cardiology Symposium and Workshop. Wyndham Milwaukee Center Hotel, Milwaukee, Wisconsin.

December 4, 2003 "Technical Challenges of Myocardial Perfusion Imaging" Bristol-Myers Squibb Medical Imaging, Troy, Wisconsin.

December 14, 2003 "Artifacts in SPECT Perfusion and Function Imaging" King Pharmaceuticals Investigator's Meeting, Loews Miami Beach Florida, Miami, Florida.

March 5, 2004 "Successful Operations of Non-Invasive Cardiology Cardiovascular Administrators' Management Conference, Hotel Intercontinental, New Orleans, Louisiana.

March 14, 2004 "Considerations for Display and Interpretation of Myocardial Perfusion Imaging" Nuclear Medicine/PET Update for Technologists, Opryland Hotel, Nashville, Tennessee.

March 14, 2004 "Considerations for Stress Testing" Nuclear Medicine/PET Update for Technologists, Opryland Hotel, Nashville, Tennessee.

March 27, 2004 "Disease Processes of the Heart" 35 Annual Spring Sympsium, New England Chapter society of Nuclear Medicine Technologist section, Braintree, Massachusetts.

March 28, 2004 "Cardiac Signs & Symptoms" 32nd Annual Spring Symposium, Greater New York Chapter Technologist Section, Society of Nuclear Medicine, Tarrytown, New York.

April 3, 2004 "Overview of Gamma Camera Quality Control" ASNC Affiliated Northeast Combined Nuclear Cardiology Working Groups Meeting. Mystic Marriott Hotel & Spa, Mystic, Connecticut.

April 3, 2004 "Processing Parameters: Techniques and Considerations" Northeast Combined Nuclear Cardiology Working Groups Meeting. Mystic Marriott Hotel & Spa, Mystic, Connecticut.

May 1, 2004 "Disease Processes of the Heart" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

May 1, 2004 "Protocols and Acquisition Considerations" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

May 2, 2004 "Nuclear Cardiology Operations" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

May 5, 2004 "Processing Considerations" Bristol-Myers Squibb Medical Imaging Customer Meeting, Ponce Hilton, Ponce, Puerto Rico

May 6, 2004 "Processing Considerations" Bristol-Myers Squibb Medical Imaging Customer Meeting, San Juan, Puerto Rico.

May 14, 2004 "How to Turn an Abstract into a Poster" Connecticut Chapter, ACP-ASIM Annual Associates Educational Meeting, Hartford Hospital, Hartford, Connecticut.

May 14, 2004 "Navigating Through PowerPoint" Connecticut Chapter, ACP-ASIM Annual Associates Educational Meeting, Hartford Hospital, Hartford, Connecticut.

May 14, 2004 "Tips for Public Speaking" Connecticut Chapter, ACP-ASIM Annual Associates Educational Meeting, Hartford Hospital, Hartford, Connecticut.

June 19, 2004 "Disease Processes of the Heart" 51st Annual Society of Nuclear Medicine Meeting. Philadelphia, Pennsylvania.

September 30, 2004 "Artifacts in Myocardial Perfusion and Function" 9th Annual American Society of Nuclear Cardiology Symposium and Scientific Sessions. New York, New York.

September 30, 2004 "Camera Related Artifacts" 9th Annual American Society of Nuclear Cardiology Symposium and Scientific Sessions. New York, New York.

October 1, 2004 "Cardiac Signs and Symptoms" 9th Annual American Society of Nuclear Cardiology Symposium and Scientific Sessions. New York, New York.

October 12, 2004 "Optimizing SPECT Perfusion and Function Imaging for Diagnosis and Risk Stratification" New England Chapter Grassroots Meeting, Delaney House Holyoke, Massachusetts.

October 30, 2004 "Adapting to Change" 18th Annual Northeast Regional Scientific Sessions. Stamford Marriott, Stamford, Connecticut.

December 3, 2004 "Practical Application of Attenuation Correction Workshop" American College of Cardiology, Gleatcher Center Chicago, Illinois.

December 3, 2004 "PET: Getting Started Workshop" American College of Cardiology, Gleatcher Center Chicago, Illinois.

December 9, 2004 "Optimizing SPECT Perfusion and Function Imaging for Diagnosis and Risk Stratification" In-service, Lawrence General Hospital, Lawrence Massachusetts.

January 29, 2005 "Update on Attenuation Correction" Annual Mid-Winter Meeting, Society of Nuclear Medicine Technologist Section Saddlebrook Resort, Tampa, Florida.

March 6, 2005 "Read with the Experts: Recognizing and Solving Gated SPECT Problems" Annual Scientific Session, American College of Cardiology, Orlando, Florida.

April 16, 2005 "Update on Attenuation Correction" Spring Symposium, New England Chapter Society of Nuclear Medicine. Sheraton, Springfield, Massachusetts.

April 30, 2005 "Processing Considerations" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

April 30, 2005 "Processing Considerations" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

May 1, 2005 "Attenuation Correction" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

May 1, 2005 "Laboratory Accreditation" Nuclear Cardiology for the Technologists, American Society of Nuclear Cardiology, University of Maryland Medical Center, Baltimore, Maryland.

May 9, 2005 "Quality Assurance: What to look for?" 7th International Conference of Nuclear Cardiology European Society of Cardiology, Lisbon, Portugal.

May 10, 2005 "How to Perform Attenuation Correction" 7th International Conference of Nuclear Cardiology, European Society of Cardiology, Lisbon, Portugal.

June 19, 2005 "Identification and Prevention of Common Artifacts in Myocardial Perfusion Imaging" 52nd Annual Society of Nuclear Medicine Meeting. Toronto, Canada.

September 29, 2005 "Tips on Public Speaking" 10th Annual American Society of Nuclear Cardiology Symposium and Scientific Sessions. Seattle, Washington.

November 12, 2005 "Roundtable Discussion: Evaluating and Purchasing New Cardiac Imaging Technologies" 48th Annual American Academy of Medical Administrators Conference, Riviera Hotel & Casino, Las Vegas, Nevada.

February 11, 2006 "Perfusion Imaging: Moving from SPECT to PET" Mid–Winter Symposium, Society of Nuclear Medicine, Tempe, Arizona.

March 9, 2006 "Cardiac Imaging for the Future: Which Way Should I Go?" 17th Annual Cardiovascular Administrators Conference, American College of Cardiovascular Administrators, Sheraton Atlanta Hotel, Atlanta, Georgia

March 11, 2006 "Acquisition and Processing" Practical Applications of Nuclear Cardiology: A Fellows/Residents Tutorial, Sheraton Atlanta Hotel, Atlanta, Georgia.

March 11, 2006 "Acquisition and Processing" Practical Applications of Nuclear Cardiology: A Fellows/Residents Tutorial, Sheraton Atlanta Hotel, Atlanta, Georgia.

April 9, 2006 "Optimizing Acquisition Parameters and Imaging Protocols" Advanced Cardiac Imaging for the Technologist, Society of Nuclear Medicine, Scottsdale Plaza Resort, Scottsdale, Arizona.

April 9, 2006 "Stress Testing for SPECT and PET" Advanced Cardiac Imaging for the Technologist, Society of Nuclear Medicine, Scottsdale Plaza Resort, Scottsdale, Arizona.

April 9, 2006 "Attenuation Correction for SPECT" Advanced Cardiac Imaging for the Technologist, Society of Nuclear Medicine, Scottsdale Plaza Resort, Scottsdale, Arizona.

October 20, 2006 "Technical Considerations for Acquisition Protocols" 31st Annual Nuclear Cardiology Symposium and Workshop, Milwaukee, Wisconsin.

October 20, 2006 "Technical Considerations for Processing" 31st Annual Nuclear Cardiology Symposium and Workshop, Milwaukee, Wisconsin.

July 22, 2006 "Cardiac Part 1" Viva Las Vegas 2006, Pacific Southwest Technologist Chapter, Society of Nuclear Medicine, Las Vegas, Nevada.

July 22, 2006 "Cardiac Part 2" Viva Las Vegas 2006, Pacific Southwest Technologist Chapter, Society of Nuclear Medicine, Las Vegas, Nevada.

April 14, 2007 "Implementing Cardiac PET and PET/CT: Considerations Beyond the Protocols" At the Heart of the Matter: Cardiac PET & PET/CT. Charlotte, North Carolina.

May 5, 2007 "Images: Processing 101" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology Chicago, Illinois.

May 5, 2007 "Quality Assurance: Techniques for Excellence and Satisfaction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology Chicago, Illinois.

May 5, 2007 "Attenuation Correction: Principles and Techniques" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology Chicago, Illinois.

May 19, 2007 "Implementing Cardiac PET and PET/CT: Considerations Beyond the Protocols" At the Heart of the Matter: Cardiac PET & PET/CT. Dallas, Texas.

April 24, 2009 "Attenuation Correction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology, Chicago, Illinois.

May 3, 2008 "Considerations of Processing" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology, Chicago, Illinois.

May 4, 2008 "Attenuation Correction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology, Chicago, Illinois.

May 4, 2008	"Quality Assurance: Techniques for Excellence and Satisfaction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology Chicago, Illinois.
September 12, 2008	"Guidelines: Their Purpose and Place" Annual Scientific Session, American Society of Nuclear Cardiology. Boston, Massachusetts.
October 11, 2008	"Considerations of Processing" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology, San Antonio, Texas.
October 12, 2008	"Attenuation Correction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology, San Antonio, Texas.
October 12, 2008	"Quality Assurance: Techniques for Excellence and Satisfaction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology San Antonio, Texas.
April 24, 2009	"PET: Principles and Instrumentation" Cardiac PET Workshop, American Society of Nuclear Cardiology, Fort Lauderdale, Florida
April 24, 2009	"Attenuation Correction" Nuclear Cardiology for the Technologist, American Society of Nuclear Cardiology, Fort Lauderdale, Florida
September 30, 2009	"Indications and Protocols for Myocardial Perfusion" Nuclear Cardiology for the Working Technologist, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
September 30, 2009	"Pharmaceutical Classifications" Nuclear Cardiology for the Working Technologist, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
October 1, 2009	"MPI and Patient Management/Outcomes" Nuclear Cardiology for the Working Technologist, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
October 1, 2009	"Basic PET Imaging" Nuclear Cardiology for the Working Technologist, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
October 2, 2009	"Acquisition (Protocols, Parameters and Artifacts)" ASNC 2009, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
October 2, 2009	"Appropriate Use Criteria and the Role of the Technologist" ASNC 2009, American Society of Nuclear Cardiology, Minneapolis, Minnesota.

October 2, 2009	"Nuclear Jeopardy" ASNC 2009, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
October 3, 2009	"F-18 Agents in Cardiology: Practical Concerns," ASNC 2009, American Society of Nuclear Cardiology, Minneapolis, Minnesota.
April 10, 2010	"Cardiac PET: 2010," New England Chapter Society of Nuclear Medicine Technologist Section Spring Symposium, Plymouth, Massachusetts.
May 14, 2010	"Diseases of the Heart," Nuclear Cardiology for the Technologists 2010, American Society of Nuclear Cardiology, Chicago, Illinois.
May 15, 2010	"How Do I Fix Attenuation?" Nuclear Cardiology for the Technologists 2010, American Society of Nuclear Cardiology, Chicago, Illinois.
May 16, 2010	"Blood Flow Imaging," Nuclear Cardiology for the Technologists 2010, American Society of Nuclear Cardiology, Chicago, Illinois.
May 16, 2010	"Laboratory Considerations for Cardiac PET: Are they different than SPECT?" Nuclear Cardiology for the Technologists 2010, American Society of Nuclear Cardiology, Chicago, Illinois.
June 7, 2010	"Cardiac PET: 2010," Society of Nuclear Medicine Annual Meeting, Salt Lake City, Utah.
September 22, 2010	"MPI and Patient Management/Outcomes- Is This Useful?" Nuclear Cardiology for the Working Technologists, ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.
September 22, 2010	"Reconstruction Processing and Filters-Does it Affect My Images?" Nuclear Cardiology for the Working Technologists, ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.
September 22, 2010	"Exercise Stress Testing Protocols and End Points" Nuclear Cardiology for the Working Technologists, ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.
September 23, 2010	Basic PET Imaging Nuclear Cardiology for the Working Technologists, ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.
September 23, 2010	Nuclear Cardiology for the Working Technologists, ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.

September 23, 2010 "*MPI and Patient Management/Outcomes – Is This Useful*?" Nuclear Cardiology for Nurses and Nurse Practitioners, ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.

September 24, 2010 "Achieving Adequate Count Statistics: Sizing Up the Individual Patient" ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.

September 25, 2010 "PET Imaging: How Does This Work?" ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.

September 25, 2010 "Laboratory Considerations: What's so different?" ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.

September 25, 2010 "Nuclear Cardiology Jeopardy *Part I: Basic Science"* ASNC 2010, American Society of Nuclear Cardiology, Philadelphia, Pennsylvania.

PUBLICATIONS

Abstracts

1. White MP, McMahon M, Russell A, Mascitelli VA, Heller GV. Clinical Comparison of Circular vs. Non-circular Orbit Using Tc-99m Myocardial SPECT Imaging. *J Nucl Med Tech* 1995; 36:263

2. McMahon M, White MP, Russell A, Travin MI, Gilliam LD, Heller GV. Comparison of Left Ventricular Function Using Gated SPECT Perfusion and Echocardiography. *J Nucl Med Tech* 1995; 23:112.

3. Mascitelli VA, Shuaib TA, Ahlberg AW, Fleming RA, White MP, Russell A, McMahon M, Herman SD, Chen C, Gilliam LD, Heller GV. Does beta-blocker therapy affect dobutamine stress? Evaluation of myocardial perfusion and wall motion. *Circulation* 1995; 92: I-667.

4. Russell A, McMahon M, Depergola A, Ahlberg A, White MP, Cross DM, Piriz J, Morris S, Heller GV. Effect of Time Upon Liver Clearance of 99m-Tc-Tetrofosmin Following Acute Chest Pain Injection: When Should Imaging Begin? *J Nuc Med Tech* 1996; 24:155.

5. Russell A, Piriz J, Cross DM, McMahon M, Shehata A, Heller GV. Utilizing Attenuation Correction to Eliminate Inferior Wall Artifact Due to Increased Hepatic Activity. *J Nucl Med Tech* 1996; 24:156.

6. White MP, Cross DM, Russell A, McMahon M, Heller GV. Technetium-99m Labeled Red Blood Cells: A Clinical Evaluation of Labeling Efficiency for Several Manufacturer's Methods. *J Nucl Med Tech* 1996; 24:173.

7. White MP, Piriz J, McMahon MV, Russell A, Cross DM, Day P, Packard A, Heller GV. Iridium-191m-A Radiopharmaceutical for the Evaluation of Ventricular Function: Technical Considerations. *J Nucl Med Tech* 1996; 24:174.

8. Piriz J, Kiernan FJ, Eldin A, Feroze H, McMahon M, Russell A, Travin MI, Mckay RG, Waters D, Heller GV. Correlation of Left Ventricular Ejection Fraction by Gated SPECT Tc-99m-Sestamibi Imaging with Contrast Ventriculography at Subsequent Cardiac Catheterization. *J Nucl Med* 1996; 37:150P.

9. Morris S, Wu AH, Ahlberg S, Feng YF, Russell A, Piriz J, Shehata A, Heller GV. The Correlation of Early Myocardial Perfusion Imaging And Cardiac Serum Markers in Acute Chest Pain Syndromes. *Circulation* 1996; 94:I133

10. Duca MD, Morris RS, Ahlberg AW, Cyr GM, Russell A, Sargent RK, Waters DD, Heller GV. Acute Myocardial Perfusion Imaging for Chest Pain Reduces the Length of Cardiac Work-up: A Randomized Trial. *J Am Coll Cardiol* 1997; 29: 522A.

11. Shareef B, Ahlberg AW, Levine MG, Giri S, Piriz JM, Russell A, Waters D, Heller GV. Gated Technetium-99m SPECT Imaging Predicts Myocardial Viability in Revascularized Patients. *J Am Coll Cardiol* 1997; 29: 522A.

12. Fossati AT, Morris RS, Ahlberg AW, Cyr GM, McGill CC, Russell A, White MP, Wackers FJ, Heller GV. Correlation of Acute Tc-99m SPECT Imaging and Coronary Artery Disease. *J Nuc Cardiol* 1997; 4: S75.

13. Duca MD, Ahlberg AW, Cyr GM, Russell A, Heller GV. Acute Myocardial Perfusion Imaging Reduced Length of Cardiac Work-up. *J Nuc Cardiol* 1997; 4:S98.

14. Levine MG, Wackers FJ, Morris RS, Ahlberg AW, McGill CC, Russell A, White MP, Waters D, Heller GV. Gender Differences in Acute Chest Pain Myocardial Imaging. *J Nuc Cardiol* 1997; 4:S69.

15. Russell A, White MP, Cross DM, Fossati AT, Levine MG, McGill CC, Heller GV. Evaluation of New ADAC Vertex Collimator for Tc-99m SPECT Myocardial Perfusion Imaging. *J Nucl Med Tech* 1997; 5:2, p151

16. White MP, Russell A, Cross DM, Clapp DA, Gillan IR, Heller GV. Effectiveness of In-Vitro Labeling for Pre-Chemotherapy Assessment of Ventricular Function in Pediatric Oncology Patients. *J Nucl Med Tech* 1997: 5:2, p151

17. White MP, Russell A, Cross DM, Ahlberg AW, Levine MG, Fossati AT, Heller GV. Does Body Habitus Impact Standardized Attenuation Correction Reconstruction: A Correlation with Cardiac Catherization. *J Nucl Med Tech* 1997; 5:2, p136.

18. Levine MG, AW Ahlberg, White MP, Fossati AT, McGill CC, Cyr GM, Russell A, Piriz JM, Heller GV. Impact of Stress Protocol Upon Myocardial Uptake with Tc-99m Tetrofosmin. *J Nucl Med* 1997; 38:73P.

19. Azar RR, Fram DB, Fossati AT, Cyr GM, McGill CC, Russell A, Hirst JA, Kiernan FJ, Waters DD, Heller GV. How Long Do Tc-99m-sestamibi Myocardial Perfusion Defects Last After Resolution of Acute Ischemia? An Angioplasty Model. *Circulation* 1997;96:I-309.

20. Danias PG, Ahlberg AW, Messineo F, Clark BA, Levine MG, Fossati AT, McGill CC, Russell A, Dougherty JE, Waters DD, Heller GV. Exercise Technetium-99m Gated SPECT Myocardial Perfusion Imaging Differentiate Non-Ischemic from Ischemic Dilated Cardiomyopathy. *Circulation* 1997;96:I-735.

21. Mansoor MR, Ahlberg AW, Levine MG, McGill CC, Cyr GM, Russell A, Cross DM, Waters DD, Heller GV. Does the Type of Vasodilator Stress Influence Defect Extent with Tc-99m Tetrofosmin SPECT Imaging? *J Am Coll Cardiol* 1998;301A.

22. Jamil G, Ahlberg AW, Danias PG, Levine MG, Mather JF, McGill CC, Russell A, White MP, Waters DD, Heller GV. Visualized Wall Motion Assessment Correlates with Quantitative Ejection Fraction Using Tc-99m Sestamibi ECG Gated SPECT Imaging in Patients with Dilated Cardiomyopathy. *J Am Coll Cardiol* 1998; 440A.

23. Cross DM, White MP, Russell A, McGill CC, Clapp DA, Phillips JM, Ferraro- Bordiga MJ, Heller GV. Arm Positioning Does Not Affect the Number, Size, or Severity of Myocardial Perfusion Imaging Defects with Tc-99m Sestamibi SPECT Imaging. *J Nucl Med Tech* 1998; 26:115

24. Russell A, Phillips JM, Ahlberg AW, White MP, Moyna NM, Levine MG, Heller GV. Does the Type of Stress Affect Tc-99m Tetrofosmin Myocardial Count Statistics? *J Nucl Med Tech* 1998; 26:116.

25. Jamil G, Elliott MD, Holly TA, McGill CC, Sarkis M, Cook C, Mann A, Ahlberg AW, Heller GV, Hendel RC. Limited Treadmill Exercise with a Shortened Adenosine Infusion Increases Defect Size and Reversibility Using Technetium-99m Sestamibi SPECT Myocardial Perfusion Imaging. *Circulation*: 1998; 98: I-588.

26. Mansoor MR, Ahlberg AW, Moyna NM, Levine MG, McGill CC, Mann A, White MP, Waters DD, Heller GV. Defect Extent and Severity and Underestimation with Dobutamine using Technetium-99m Tetrofosmin Single-Photon Emission Computed Tomographic Myocardial Perfusion Imaging. *J Am Coll Cardiol*: 1999; 418A.

27. Fossati AT, Ferraro-Bordiga MJ, Ahlberg AW, White CM, Mann A, Waters DD, Heller GV. The Acute Administration of 17β-Estradiol Decrease the Size of Adenosine-Induced

Myocardial Perfusion Defects in Post-Menopausal Women with Coronary Disease. *J Am Coll Cardiol*: 1999; 225A.

28. Murthy DR, Katten D, McGill CC, White CM, Mann A, Saloum A, Ferraro-Bordiga M, Water DD, Heller GV. Impact of Glucagon on Acute Beta Blockade During Dobutamine Stress Testing Using Tc-99m Sestamibi Single Photon Emission Computed Tomographic Imaging. *J Nucl Med* 1999;40:128P.

29. DeGroot MC, Ahlberg AW, Marini D, McGill CC, Cyr GC, Mann A, Heller GV. Is Dobtamine Superior to Dipyridamole in Evaluating the Severity and Reversibility of Defects Using Tc-99m Sestamibi SPECT Imaging in Patients with Coronary Artery Disease? *J Am Coll Cardiol*: 2000:

30. Marini D, DeGroot MC, Ahlberg AW, Cyr GC, Mann A, Heller GV. Stress Technetium-99m Sestamibi Gated SPECT Imaging Can Differentiate Non-Ischemic, Ischemic or Combined Origins of Dilated Cardiomyopathy. *J Am Coll Cardiol*: 2000:*J Am Coll Cardiol*: 2000; .

31. Mann A, Salloum A, Ahmed J, Marini D, Ahlberg AW, Heller, GV. Patients with LBBB: What is the Appropriate Stress Modality for Myocardial Perfusion Imaging. *J Nucl Med Tech* 2000; 28:136.

32. Mann A, Ahlberg AW, Duncan B, McGill CC, Heller, GV. Low Dose Dobutamine During Gated Technetium Sestamibi Single Photon Emission Computed Tomography Predicts Myocardial Viability. *J Nucl Med Tech* 2000; 28:136.

33. Aoun G, Lu T, Marini D. Primiano C, Fleming R, Mann A, Ahlberg A, Heller GV. Comparison of Dipyridamole (DIP) and Adenosine (AD) Using Tc-99m Sestamibi SPECT Imaging: A Prospective Randomized Clinical Study. *J Nuc Cardiol* 2000; 7:S13.

34. Gemayel CY, Verma VK, Velusamy M, Mann A, Katten D, Ahlberg A, Mather J, Heller GV. The Prognostic Value of Stress Technetium-99m Sestamibi Gated Single Photon Emission Computed Tomography in Patient with Dilated Cardiomyopathy. *J Am Coll Cardiol*:2001;381A:1033-146.

35. Mann A, Ahlberg A, Harrison S, Aoun G, Primiano C, McGill CC, Fleming R, Heller GV. Diagnostic Accuracy of Dipyridamole and Adenosine Using 99m-Tc Sestamibi SPECT Imaging: A Prospective Randomized Trial. *J Nucl Med Tech* 2001; 29(2):109

36. Harrison S, Mann A, Fram D, Morgan E, Ahlberg A, Dyckman W, Heller GV. Impact of Coronary Flow Restoration on Acute Rest Myocardial Perfusion Imaging: an Animal Model. *J Nucl Med Tech* 2001; 29(2):117.

Manuscripts, Journal Articles and Books

1. White MP, Russell A, Mascitelli VA, Morris RS, Shehata A, Heller GV. Clinical Comparison of Circular versus Non-circular Acquisition using Technetium-99m Myocardial Perfusion SPECT Imaging. *J Nucl Med Tech* 1997; 37.

2. Russell A. Technical Considerations for Acute Myocardial Perfusion Imaging. *New England Journal of Nuclear Medicine Technology* 1997; 21: 7.

3. Shehata AR, Ahlberg AW, White MP, Mann A, Fleming IA, Levine MG, Mather JF, Waters DD, Heller GV. Dipyridamole-Dobutamine Stress with Tc-99m Sestamibi Tomographic Myocardial Perfusion Imaging. *Am J Cardiol* 1998; 82:520-523.

4. Mann A, White MP. The Role of the Technologist in Nuclear Cardiology. *J Nuc Cardiol* 1998; 5:438-441.

5. Mann A, Ahlberg AW, White MP, Cross DM, Piriz J, Morris RS, Heller GV. The Impact of Time on Liver Clearance of Technetium-99m-Tetrofosmin in Patients with Acute Chest Pain Injection: When Should Imaging Begin? *J Nucl Med Tech* 1998; 26:186-190.

6. White MP, Mann A, Saari MA. Gated SPECT Imaging 101. *J Nuc Cardiol* 1998; 5:523-26.

7. Mann A. Gated SPECT Imaging for the Technologist. *New England Journal of Nuclear Medicine* 1998: December Issue.

8. White MP, Cross DM, Mann A, Heller GV. An Evaluation of Technetium-99mTc Red Blood Cell Labeling Efficiency and Clinical Impact on Pediatric Oncology Patients. *J Nuc Med Tech* 1998; 26:265-26.

9. Danias PG, Ahlberg AW, Clark B, Messineo F, Levine MG, McGill CC, Mann A, Clive J, Dougherty JE, Water DD, Heller GV. Combined Assessment of Myocardial Perfusion and Left Ventricular Function with Exercise Technetium-99m Sestamibi Gated Single-Photon Emission Computed Tomography Can Differentiate Between Ischemic and Non-ischemic Dilated Cardiomyopathy. *Am J Cardiol* 1998;82 1253-1258.

10. Mann A, White MP and Heller GV. Acute Myocardial Perfusion Imaging for the Technologist. *J Nuc Cardiol* 1998; 5:622-625.

11. Heller GV, Iskandrian AE, Orlandi C, Ahlberg AW, Heo J, Mann A, White WP, Gagnon A, Taillefer R. Fasting and Nonfasting Iodoine-123-Idophenylpentadecanoic Acid Myocardial SPECT Imaging in Coronary Artery Disease. *J Nucl Med* 1998; 39:2019-2022.

12. Toma DM, White MP, Mann A, McGill CC, Pelchat DA, Phillips JM, Ferraro-Bordiga M, Heller GV. Influence of Arm Positioning Upon Rest/Stress Tc-99m Sestamibi Tomographic Imaging. *J Nuc Cardiol* 1999; 6:163-168.

13. Mann A. Women's Health Issues and Nuclear Medicine, Part 1: Women and Heart Disease. *J Nuc Med Tech 1999*; 27:89-92.

14. Mann A. Women's Health Issues and Nuclear Medicine, Part 2: Women and Breast Cancer. *J Nuc Med Tech 1999*; 27:184-187.

15. Levine MG, Ahlberg AW, Mann A, White MP, McGill CC, Mendez de Leon C, Piriz JM, Waters DD, Heller GV. Comparison of Exercise, Dipyridamole, Adenosine, and Dobutamine Stress Using Technetium 99m Tetrofosmin Tomographic Imaging. *J Nucl Cardiol*. 1999;6:389-396.

16. Mann A. Women's Health Issues and Nuclear Medicine, Part 3: Women and Osteoporosis. *J Nuc Med Tech* 1999; 27:266-270.

17. Mann A. Quality Control for Myocardial Perfusion Imaging. In: Nuclear Cardiology: Practical Applications: Chapter 11. Heller GV and Hendel R editors. McGraw Hill Medical Publishing Group, New York, New York. 2004.

18. Mann A. Examining Attenuation Correction. *Uptake* 2005;11(1): 5-6.

19. Mann A. Protocols and Acquisition Parameters for SPECT Myocardial Perfusion Imaging. Chapter 9. In: Technical Applications of Nuclear Cardiology. Heller GV, Mann A, Hendel R editors. McGraw Hill Medical Publishing Group, New York, New York. 2009.

20. Heller GV, Mann A, Hendel R editors. Technical Applications of Nuclear Cardiology McGraw Hill Medical Publishing Group, New York, New York. 2009.

21. Mann A. Quality Control for Myocardial Perfusion Imaging. In: Nuclear Cardiology: Practical Applications 2nd edition: Chapter 4. Heller GV and Hendel R editors. McGraw Hill Companies Inc, New York, New York. 2011.

22. Mann A. Time for a New Normal in Nuclear Cardiology? *Imaging Technology News,* October Issue, Scranton Gillette Communications 2010.

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U. S. TREASURY DEPARTMENT
INTERNAL REVENUE SERVICE
WASHINGTON 25, D. C.

Vol J

IN REPLY REFER TO
T:R:EO:4
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JAN 6 1960

Hartford Hospital
Hartford 15, Connecticut

Gentlemen:

This refers to your letter of November 13, 1959 in which you state that you received a ruling from this office dated August 11, 1953, exempting you from Federal income tax under the provisions of section 101(6) of the Internal Revenue Code. This ruling also had the effect of affirming prior rulings dated August 28, 1934, September 19, 1938 and January 27, 1941. You are now requesting that your status be brought up to date to conform with the 1954 Code, section 501(c)(3).

Treasury Regulations prescribed under the Internal Revenue Code of 1954 provide at section 1.501(a)-1(a)(2), as amended by Treasury Decision 6391, published June 26, 1959, for situations such as yours and read, in part, as follows:

> "Subject only to the Commissioner's inherent power to revoke rulings because of a change in the law or regulations or for other good cause, an organization that has been determined by the Commissioner or the district director to be exempt under section 501(a) or the corresponding provision of prior law may rely upon such determination so long as there are no substantial changes in the organization's character, purposes, or methods of operation. An organization which has been determined to be exempt under the provisions of the Internal Revenue Code of 1939 or prior law is not required to secure a new determination of exemption merely because of the enactment of the Internal Revenue Code of 1954 unless affected by substantive changes in law made by such Code."

In view of the present Regulations you are not required to have your existing exempt status affirmed under the 1954 Code in the absence of basic changes in your organization and/or operations. If you prefer, as a matter of convenience, to have a current ruling on your

status it will be necessary for you to file a new exemption application, Form 1023, with your District Director at Hartford, Connecticut, together with all supporting documents required by the application, as well as a statement in some detail concerning your activities subsequent to 1953. Inasmuch as we have on file the copies of your charter and by-laws submitted with your prior application, further copies of these documents need not be furnished, but any amendments subsequent to July 1953 should be supplied. For your use in this connection, there are enclosed three copies of Form 1023, two executed copies of which may be filed and the third may be retained for your use.

A cursory examination of your charter shows that it does not specify that you are organized as a nonprofit charitable hospital, contains no provision requiring you to be operated to the extent of your financial ability for those not able to pay for the services rendered, and other requirements of Revenue Ruling 56-185, published in Internal Revenue Bulletin 1956-1, page 202, which establishes the criteria to be met in determining whether a hospital qualifies for exemption as an organization described in section 501(c)(3) of the 1954 Code. Further, your charter does not contain any provision impressing your assets with a trust by providing that in the event of dissolution your assets are required to be distributed for one or more of the purposes described in section 501(c)(3). In this connection your attention is invited to section 1.501(c)(3)-1(b)(6) of the Regulations which reads, in part, as follows:

> "Applicability of the organizational test. A determination by the Commissioner or a district director that an organization is described in section 501(c)(3) and exempt under section 501(a) will not be granted after July 26, 1959 (regardless of when the application is filed), unless such organization meets the organizational test prescribed by this paragraph. If, before July 27, 1959, an organization has been determined by the Commissioner or district director to be exempt as an organization described in section 501(c)(3) or in a corresponding provision of prior law and such determination has not been revoked before such date, the fact that such organization does not meet the organizational test prescribed by this paragraph shall not be a basis for revoking such determination. Accordingly, an organization which has been determined to be exempt before July 27, 1959, and which does not seek a new determination of exemption is not required to amend its articles of organiza-

tion to conform to the rules of this paragraph, but any organization which seeks a determination of exemption after July 26, 1959, must have articles of organization which meet the rules of this paragraph. * * *"

This office is also in receipt of a communication, dated April 16, 1959, from Shipmen & Goodwin, Counselors at law, Hartford, Connecticut, submitting in your behalf a request for a ruling on certain proposed transaction contemplated by you with respect to their effect on your exempt status. You are advised that our reply to this request will be held in abeyance pending receipt of advice from you as to what further action you intend to take with regard to having your status affirmed under the Internal Revenue Code of 1954.

Your reply should also contain information concerning any implementing action which you may have taken subsequent to April 1959 with regard to the proposed transactions.

Your reply should be directed to the attention of T:R:EO:4-VCS.

Very truly yours,

G. F. Worley

Chief, Exempt Organizations Branch

Enclosure:
Form 1023 (3)

5

HOSPITAL

12. C (i). Please provide one year of actual results and three years of projections of **Total Facility** revenue, expense and volume statistics without, incremental to and with the CON proposal in the following reporting format:

Total Facility: Description	FY2013 Actual Results	FY2015 Projected W/out CON	FY2015 Projected Incremental	FY2015 Projected With CON	FY2016 Projected W/out CON	FY2016 Projected Incremental	FY2016 Projected With CON	FY2017 Projected W/out CON	FY2017 Projected Incremental	FY2017 Projected With CON
NET PATIENT REVENUE										
Non-Government	$ 460,506,323	$ 495,973,616	$ (638,527)	$ 495,335,089	$ 501,833,164	$ (664,068)	$ 501,169,096	$ 521,540,338	$ (690,631)	$ 520,849,707
Medicare	346,866,418	324,798,679	(530,009)	324,268,670	328,635,926	(551,209)	328,084,717	341,541,581	(573,258)	340,968,323
Medicaid and Other Medical Assistance	107,949,242	115,447,618	(10,814)	115,436,804	116,811,543	(11,247)	116,800,297	121,398,776	(11,696)	121,387,079
Other Government	5,930,404	6,675,311	(2,297)	6,673,014	6,754,175	(2,389)	6,751,786	7,019,414	(2,484)	7,016,929
Total Net Patient Patient Revenue	$ 921,252,388	$ 942,895,224	$ (1,181,647)	$ 941,713,577	$ 954,034,808	$ (1,228,913)	$ 952,805,895	$ 991,500,108	$ (1,278,069)	$ 990,222,039
Other Operating Revenue	$ 166,453,592	$ 125,336,000	$ -	$ 125,336,000	$ 128,706,000	$ -	$ 128,706,000	$ 132,160,000	$ -	$ 132,160,000
Revenue from Operations	$ 1,087,705,980	$ 1,068,231,224	$ (1,181,647)	$ 1,067,049,577	$ 1,082,740,808	$ (1,228,913)	$ 1,081,511,895	$ 1,123,660,108	$ (1,278,069)	$ 1,122,382,039
OPERATING EXPENSES										
Salaries and Fringe Benefits	$ 635,265,810	$ 570,344,000	$ (254,280)	$ 570,089,720	$ 589,695,000	$ (264,451)	$ 589,430,549	$ 604,468,000	$ (275,029)	$ 604,192,971
Professional / Contracted Services	49,772,864	51,763,779	(670,230)	51,093,549	53,834,330	(697,039)	53,137,291	55,987,703	(724,920)	55,262,782
Supplies and Drugs	138,139,487	149,411,669	(144,100)	149,267,569	155,388,136	(149,864)	155,238,272	161,603,661	(155,858)	161,447,803
Bad Debts	17,467,613	22,243,224	-	22,243,224	22,190,808	-	22,190,808	22,726,108	-	22,726,108
Other Operating Expense	180,814,556	137,817,552	-	137,817,552	114,827,534	-	114,827,534	118,278,636	-	118,278,636
Subtotal	$ 1,021,460,330	$ 931,580,224	$ (1,068,610)	$ 930,511,614	$ 935,935,808	$ (1,111,354)	$ 934,824,454	$ 963,066,108	$ (1,155,808)	$ 961,910,300
Depreciation/Amortization	48,416,843	57,202,000	-	57,202,000	61,986,000	-	61,986,000	68,101,000	-	68,101,000
Interest Expense	5,704,467	9,308,000	-	9,308,000	7,664,000	-	7,664,000	12,632,000	-	12,632,000
Lease Expense	17,128,320	17,842,000	(121,675)	17,720,325	18,825,000	(126,542)	18,698,458	19,310,000	(131,603)	19,178,397
Total Operating Expense	$ 1,092,709,980	$ 1,015,932,224	$ (1,190,284)	$ 1,014,741,940	$ 1,024,410,808	$ (1,237,896)	$ 1,023,172,912	$ 1,063,109,108	$ (1,287,411)	$ 1,061,821,697
Gain/(Loss) from Operations	$ (5,004,000)	$ 52,299,000	$ 8,637	$ 52,307,637	$ 58,330,000	$ 8,983	$ 58,338,983	$ 60,551,000	$ 9,342	$ 60,560,342
Plus: Non-Operating Revenue	$ 56,434,420	$ 25,817,000	$ -	$ 25,817,000	$ 25,817,000	$ -	$ 25,817,000	$ 25,817,000	$ -	$ 25,817,000
Revenue Over/(Under) Expense	$ 51,430,420	$ 78,116,000	$ 8,637	$ 78,124,637	$ 84,147,000	$ 8,983	$ 84,155,983	$ 86,368,000	$ 9,342	$ 86,377,342
FTEs	6,125	5,473	(3)	5,470	5,513	(3)	5,510	5,488	(3)	5,485
Patient Volume	3,462	3,283	(1,076)	2,207	3,283	(1,076)	2,207	3,283	(1,076)	2,207

*Volume Statistics:
Provide projected inpatient and/or outpatient statistics for any new services and provide actual and projected inpatient and/or outpatient statistics for any existing services which will change due to the proposal.

Incremental Rev Increase	4%
Incremental Exense Increase	4%

Bad Debt for Incremental is Included in Non Government

SYSTEM

12. C (i). Please provide one year of actual results and three years of ***Total Hospital Health System*** projections of revenue, expense and volume statistics without, incremental to and with the CON proposal in the following reporting format:

Total Hospital Health System: Description	FY2013 Actual Results	FY2015 Projected W/out CON	FY2015 Projected Incremental	FY2015 Projected With CON	FY2016 Projected W/out CON	FY2016 Projected Incremental	FY2016 Projected With CON	FY2017 Projected W/out CON	FY2017 Projected Incremental	FY2017 Projected With CON
NET PATIENT REVENUE										
Non-Government	$ 1,025,414,533	$ 1,203,474,749	$ (638,527)	$ 1,202,836,222	$ 1,222,672,146	$ (664,068)	$ 1,222,008,078	$ 1,256,817,918	$ (690,631)	$ 1,256,127,287
Medicare	676,697,154	690,790,387	(530,009)	690,260,378	701,809,627	(551,209)	701,258,418	721,409,183	(573,258)	720,835,926
Medicaid and Other Medical Assistance	237,207,354	264,765,573	(10,814)	264,754,759	268,989,018	(11,247)	268,977,771	276,501,120	(11,696)	276,489,423
Other Government	9,933,960	11,404,292	(2,297)	11,401,995	11,586,209	(2,389)	11,583,820	11,909,779	(2,484)	11,907,294
Total Net Patient Patient Revenue	$ 1,949,253,000	$ 2,170,435,000	$ (1,181,647)	$ 2,169,253,353	$ 2,205,057,000	$ (1,228,913)	$ 2,203,828,087	$ 2,266,638,000	$ (1,278,069)	$ 2,265,359,931
Other Operating Revenue	$ 219,986,000	$ 250,534,000	$ -	$ 250,534,000	$ 253,471,000	$ -	$ 253,471,000	$ 264,203,000	$ -	$ 264,203,000
Revenue from Operations	$ 2,169,239,000	$ 2,420,969,000	$ (1,181,647)	$ 2,419,787,353	$ 2,458,528,000	$ (1,228,913)	$ 2,457,299,087	$ 2,530,841,000	$ (1,278,069)	$ 2,529,562,931
OPERATING EXPENSES										
Salaries and Fringe Benefits	$ 1,311,018,000	$ 1,476,563,000	$ (254,280)	$ 1,476,308,720	$ 1,507,646,000	$ (264,451)	$ 1,507,381,549	$ 1,537,028,000	$ (275,029)	$ 1,536,752,971
Professional / Contracted Services	68,794,000	71,545,760	(670,230)	70,875,530	74,407,590	(697,039)	73,710,552	77,383,894	(724,920)	76,658,974
Supplies and Drugs	270,728,000	281,557,120	(144,100)	281,413,020	292,819,405	(149,864)	292,669,541	304,532,181	(155,858)	304,376,323
Bad Debts	43,010,000	53,760,398	-	53,760,398	53,744,967	-	53,744,967	54,025,955	-	54,025,955
Other Operating Expense	327,963,080	322,958,120	-	322,958,120	289,808,005	-	289,808,005	293,924,925	-	293,924,925
Subtotal	$ 2,021,513,080	$ 2,206,384,398	$ (1,068,610)	$ 2,205,315,789	$ 2,218,425,967	$ (1,111,354)	$ 2,217,314,613	$ 2,266,894,955	$ (1,155,808)	$ 2,265,739,146
Depreciation/Amortization	102,308,000	129,833,000	-	129,833,000	136,957,000	-	136,957,000	146,564,000	-	146,564,000
Interest Expense	13,969,000	24,511,000	-	24,511,000	21,458,000	-	21,458,000	25,241,000	-	25,241,000
Lease Expense*	66,217,920	68,977,000	(121,675)	68,855,325	71,571,000	(126,542)	71,444,458	73,680,000	(131,603)	73,548,397
Total Operating Expense	$ 2,204,008,000	$ 2,429,705,398	$ (1,190,284)	$ 2,428,515,114	$ 2,448,411,967	$ (1,237,896)	$ 2,447,174,071	$ 2,512,379,955	$ (1,287,411)	$ 2,511,092,543
Gain/(Loss) from Operations	$ (34,769,000)	$ (8,736,398)	$ 8,637	$ (8,727,761)	$ 10,116,033	$ 8,983	$ 10,125,016	$ 18,461,045	$ 9,342	$ 18,470,387
Plus: Non-Operating Revenue	$ 85,160,000	$ 40,289,000	$ -	$ 40,289,000	$ 40,231,000	$ -	$ 40,231,000	$ 40,168,000	$ -	$ 40,168,000
Revenue Over/(Under) Expense	$ 50,391,000	$ 31,552,602	$ 8,637	$ 31,561,239	$ 50,347,033	$ 8,983	$ 50,356,016	$ 58,629,045	$ 9,342	$ 58,638,387
FTEs	14,679	13,802	(3)	13,799	13,753	(3)	13,750	13,716	(3)	13,713
Patient Volume	3,462	3,283	(1,076)	2,207	3,283	(1,076)	2,207	3,283	(1,076)	2,207

*Volume Statistics:
Provide projected inpatient and/or outpatient statistics for any new services and provide actual and projected inpatient and/or outpatient statistics for any existing services which will change due to the proposal.

Bad Debt for Incremental is Included in Non Government

12.C(ii). Please provide **three** years of projections of incremental revenue, expense and volume statistics **attributable to the proposal** in the following reporting format:

Type of Service Description	Nuclear Cardiology
Type of Unit Description:	Cases
# of Months in Operation	12

FY 2015 **FY Projected Incremental** Total Incremental Expenses: $ 1,190,284 **Total Facility by Payer Category:**	(1)	(2) Rate	(3) Units	(4) Gross Revenue Col. 2 * Col. 3	(5) Allowances/ Deductions	(6) Charity Care	(7) Bad Debt	(8) Net Revenue Col.4 - Col.5 -Col.6 - Col.7	(9) Operating Expenses Col. 1 Total * Col. 4 / Col. 4 Total	(10) Gain/(Loss) from Operations Col. 8 - Col. 9
Medicare		$ 4,529	590	$ 2,670,777	$ 2,138,471	$ -	$ -	$ 532,306	$ 652,303	$ (119,997)
Medicaid		4,529	11	51,134	40,320	-	-	10,814	12,489	(1,675)
CHAMPUS/TriCare		4,529	-	-	-	-	-	-	-	-
Total Governmental			**601**	**$ 2,721,911**	**$ 2,178,791**	**$ -**	**$ -**	**$ 543,120**	**$ 664,791**	**$ (121,671)**
Commericial Insurers		$ 4,529	454	$ 2,057,167	$ 1,446,487	$ -	$ -	$ 610,680	$ 502,436	$ 108,244
Uninsured		4,529	21	94,402	66,555	-	-	27,847	23,056	4,791
Total NonGovernment		**$ 4,529**	**475**	**$ 2,151,569**	**$ 1,513,042**	**$ -**	**$ -**	**$ 638,527**	**$ 525,493**	**$ 113,034**
Total All Payers		**$ 4,529**	**1,076**	**$ 4,873,480**	**$ 3,691,833**	**$ -**	**$ -**	**$ 1,181,647**	**$ 1,190,284**	**$ (8,637)**

**Other Government included in Medicare Volume*
***Self-insured and self-pay included in Uninsured Volume*
****GL = Gross Rev - Net Rev = Allowance / Deduction Allocation*

12.C(ii). Please provide **three** years of projections of incremental revenue, expense and volume statistics **attributable to the proposal** in the following reporting format:

Type of Service Description	Nuclear Cardiology
Type of Unit Description:	Cases
# of Months in Operation	12

FY2016 **FY Projected Incremental** Total Incremental Expenses:	(1) **$1,190,284**	(2) Rate	(3) Units	(4) Gross Revenue Col. 2 * Col. 3	(5) Allowances/ Deductions	(6) Charity Care	(7) Bad Debt	(8) Net Revenue Col.4 - Col.5 -Col.6 - Col.7	(9) Operating Expenses Col. 1 Total * Col. 4 / Col. 4 Total	(10) Gain/(Loss) from Operations Col. 8 - Col. 9
Total Facility by Payer Category:										
Medicare		$ 4,529	$ 590	$ 2,670,777	$ 2,138,471	$ -	$ -	$ 532,306	$ 652,303	$ (119,997)
Medicaid		4,529	11	51,134	40,320	-	-	10,814	12,489	(1,675)
CHAMPUS/TriCare		4,529	-	-	-	-	-	-	-	-
Total Governmental			**$ 601**	**$ 2,721,911**	**$ 2,178,791**	**$ -**	**$ -**	**$ 543,120**	**$ 664,791**	**$ (121,671)**
Commericial Insurers		$ 4,529	$ 454	$ 2,057,167	$ 1,446,487	$ -	$ -	$ 610,680	$ 502,436	$ 108,244
Uninsured		4,529	21	94,402	66,555	-	-	27,847	23,056	4,791
Total NonGovernment		**$ 4,529**	**$ 475**	**$ 2,151,569**	**$ 1,513,042**	**$ -**	**$ -**	**$ 638,527**	**$ 525,493**	**$ 113,034**
Total All Payers		**$ 4,529**	**$ 1,076**	**$ 4,873,480**	**$ 3,691,833**	**$ -**	**$ -**	**$ 1,181,647**	**$ 1,190,284**	**$ (8,637)**

**Other Government included in Medicare Volume*
***Self-insured and self-pay included in Uninsured Volume*
****GL = Gross Rev - Net Rev = Allowance / Deduction Allocation*

12.C(ii). Please provide **three** years of projections of incremental revenue, expense and volume statistics **attributable to the proposal** in the following reporting format:

Type of Service Description	Nuclear Cardiology
Type of Unit Description:	Cases
# of Months in Operation	12

FY2017 **FY Projected Incremental** Total Incremental Expenses:	(1) **$1,190,284**	(2) Rate	(3) Units	(4) Gross Revenue Col. 2 * Col. 3	(5) Allowances/ Deductions	(6) Charity Care	(7) Bad Debt	(8) Net Revenue Col.4 - Col.5 -Col.6 - Col.7	(9) Operating Expenses Col. 1 Total * Col. 4 / Col. 4 Total	(10) Gain/(Loss) from Operations Col. 8 - Col. 9
Total Facility by Payer Category:										
Medicare		$ 4,529	$ 590	$ 2,670,777	$ 2,138,471	$ -	$ -	$ 532,306	$ 652,303	$ (119,997)
Medicaid		4,529	11	51,134	40,320	-	-	10,814	12,489	(1,675)
CHAMPUS/TriCare		4,529	-	-	-	-	-	-	-	-
Total Governmental			**$ 601**	**$ 2,721,911**	**$ 2,178,791**	**$ -**	**$ -**	**$ 543,120**	**$ 664,791**	**$ (121,671)**
Commericial Insurers		$ 4,529	$ 454	$ 2,057,167	$ 1,446,487	$ -	$ -	$ 610,680	$ 502,436	$ 108,244
Uninsured		4,529	21	94,402	66,555	-	-	27,847	23,056	4,791
Total NonGovernment		**$ 4,529**	**$ 475**	**$ 2,151,569**	**$ 1,513,042**	**$ -**	**$ -**	**$ 638,527**	**$ 525,493**	**$ 113,034**
Total All Payers		**$ 4,529**	**$ 1,076**	**$ 4,873,480**	**$ 3,691,833**	**$ -**	**$ -**	**$ 1,181,647**	**$ 1,190,284**	**$ (8,637)**

**Other Government included in Medicare Volume*
***Self-insured and self-pay included in Uninsured Volume*
****GL = Gross Rev - Net Rev = Allowance / Deduction Allocation*

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Office of Health Care Access

October 28, 2014

VIA FAX ONLY

Barbara A. Durdy
Director, Strategic Planning
Hartford Healthcare
181 Patricia Genova Drive
Newington, CT 06111

RE: Certificate of Need Application, Docket Number 14-31955-CON
Hartford Hospital
Termination of nuclear cardiology imaging services at the following locations: 100 Simsbury Road, Avon; 100 Retreat Avenue, Hartford; 703 Hebron Avenue, Glastonbury; 65 Memorial Road, West Hartford; and 11 South Road, Farmington

Dear Ms. Durdy:

On October 14, 2014, the Office of Health Care Access ("OHCA") received your Certificate of Need ("CON") application ("application") filing on behalf of Hartford Hospital ("Hospital") concerning the Hospital's proposal to terminate nuclear cardiology imaging services at five locations.

OHCA has reviewed the CON application and requests the following additional information pursuant to General Statutes §19a-639a(c).

1. The Hospital included several articles as part of the application. Provide additional discussion of cardiovascular imaging tests, including alternative testing modalities currently available. Discuss how the appropriate use criteria for diagnostic testing and the greater insurance company authorization requirements have attributed to a decrease in the demand for nuclear cardiology imaging services. Reference the relevant sections of the articles to support the Hospital's position.

2. Although the Hospital states that declining numbers are one of the reasons to terminate the nuclear cardiology imaging services at the five locations, two of the locations do not report declining volumes. Provide additional discussion on the declining volumes of nuclear cardiology imaging services as a whole and at each location.

3. Explain what is meant by the phrase "desire to better utilize and allocate Hospital resources" when stating the reasons for terminating the nuclear cardiology imaging services

4. Report the number of patients by town separately for each location. For FY 2014, provide the number of patients through September 30 at a minimum. Please the following report format:

NUMBER OF PATIENT VISITS BY SERVICE LOCATION,
PATIENT TOWN OF RESIDENCE AND FISCAL YEAR,

Service Location	Patient Town of Residence	Fiscal Year*			
		2011	2012	2013	2014**

* The fiscal year is from October 1 to September 30

** Enter the ending report date:_____

5. List the towns from the table above that are included in the Hospital service area.

6. Provide a list of the physician practices names and addresses of office locations (whether or not nuclear cardiac imaging services are available.)

7. Table 5 on page 13 of the application reports the number of persons that received nuclear cardiology imaging services in the current year. According to the Hospital's proposal, these patients will be receiving their future cardiac imaging at a non-Hospital based provider. Please review and update the information reported in Table 5 for the following:

    a. Identify the projected fiscal years that are reported.
    b. If these are Hospital patients, where will the patients be receiving their cardiac imaging services?
    c. Explain why the projected numbers are the same for each payer for each year.

8. How long will it be until the private cardiology physician practices in Avon and Farmington will purchase SPECT myocardial perfusion imaging cameras and begin providing services at these two locations?

9. Describe the nuclear cardiology imaging services and the alternative testing modalities that the Hospital will provide to patients and where they will be provided should the Hospital's proposal be implemented.

10. Explain how the proposal will improve cost-effectiveness in the region. (See Question 5b on page 14.) How will the proposal affect the rates charged for the nuclear cardiology imaging services under the Hospital and under the private physician practices?

In responding to the questions contained in this letter, please repeat each question before providing your response. Paginate and date your response, i.e., each page in its entirety. Information filed after the initial CON application submission (e.g., completeness response

letter, prefile testimony, late file submissions and the like) must be numbered sequentially from the Applicant's document preceding it. Please begin your submission using Page 91 and reference "Docket Number: 14-31955-CON." Submit one (1) original and three (3) hard copies of your response. In addition, please submit a scanned copy of your response, in an Adobe format (.pdf) including all attachments on CD. If available, a copy of the response in MS Word should also be copied to the CD.

Pursuant to Section 19a-639a(c) of the Connecticut General Statutes, you must submit your response to this request for additional information not later than sixty days after the date that this request was transmitted. Therefore, please provide your written responses to OHCA no later than December 27, 2014, otherwise your application will be automatically considered withdrawn. If you have any questions concerning this letter, please feel free to contact me by email at laurie.greci@ct.gov or by telephone at (860) 418-7032.

Sincerely,

Laurie Greci
Associate Research Analyst

* * * COMMUNICATION RESULT REPORT (OCT. 28. 2014 8:53AM) * * *

FAX HEADER:

TRANSMITTED/STORED : OCT. 28. 2014 8:52AM FILE MODE	OPTION	ADDRESS	RESULT	PAGE
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REASON FOR ERROR
E-1) HANG UP OR LINE FAIL
E-2) BUSY
E-3) NO ANSWER
E-4) NO FACSIMILE CONNECTION

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
OFFICE OF HEALTH CARE ACCESS

FAX SHEET

TO: Barbara Durdy, Director, Strategic Planning Hartford HealthCare

FAX: (860) 972-9025

AGENCY: Hartford Hospital

FROM: Laurie Greci

DATE: 10/28/2014

NUMBER OF PAGES: 4
(including transmittal sheet

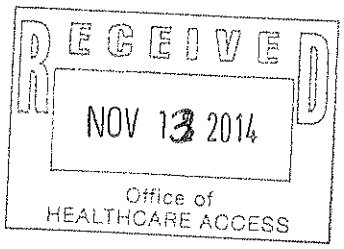
Comments:

RE: Certificate of Need Application, Docket Number 14-31955-CON
Termination of nuclear cardiology imaging services at the following locations: 100 Simsbury Road, Avon; 100 Retreat Avenue, Hartford; 703 Hebron Avenue, Glastonbury; 65 Memorial Road, West Hartford; and 11 South Road, Farmington

PLEASE PHONE IF THERE ARE ANY TRANSMISSION PROBLEMS.

Phone: (860) 418-7001 Fax: (860) 418-7053
410 Capitol Ave., MS#13HCA
P.O.Box 340308Hartford, CT 06134

Hartford HealthCare



November 7, 2014

Laurie Greci
Associate Research Analyst
Office of Health Care Access
Division of the Department of Public Health
410 Capital Avenue, MS#13HCA
Hartford, CT 06106

Re: Hartford Hospital
Certificate of Need Application: Termination of Nuclear Cardiology Services at Provider-Based Satellite Locations
Docket Number: 14-31955CON

Dear Ms. Greci:

Enclosed please find Hartford Hospital's response to the Office of Health Care Access Completeness letter dated October 28, 2014. As requested, I have included 1 original and 3 hard copies of our response along with a scanned copy on CD. A copy of our response is also included on the CD in Microsoft Word format.

Please do not hesitate to contact me at 860-972-4231 if you have any questions.

Sincerely,

Barbara A. Durdy
Director, Strategic Planning
Hartford HealthCare

Enclosures

State of Connecticut
Office of Health Care Access
Certificate of Need Application

Applicant:
Hartford Hospital

Project Name:
Termination of Nuclear Cardiology Services at Hartford Hospital Provider-Based Satellite Locations
Docket Number: 14-31955CON

Response to Completeness Letter dated 10/28/14

Hartford Hospital Response to OHCA Completeness Questions

1. The Hospital included several articles as part of the application. Provide additional discussion of cardiovascular imaging tests, including alternative testing modalities currently available. Discuss how the appropriate use criteria for diagnostic testing and the greater insurance company authorization requirements have attributed to a decrease in the demand for nuclear cardiology imaging services. Reference the relevant sections of the articles to support the Hospital's position.

Applicant's Response:

The research letter published in JAMA in March, 2014 (page 21 of the CON application) by McNulty *et al* examining Kaiser Permanente data found that nuclear cardiology imaging procedures increased in volume from 2000 to 2006 and then declined through the end of their study period in 2011. This trend was also seen in Medicare recipients in a study by Levin *et al* published in the Journal of the American College of Radiology in March, 2013 where nuclear cardiology imaging procedure utilization rose from 2000 through 2004, stabilized from 2005 to 2008, and declined in 2009 and 2010. McNulty *et al* suggested that the decline from the peak in 2006 seen in both studies may have been due to publication of Appropriate Use Criteria in 2005.

As described in The Advisory Board article "CV imaging ranks highly among unnecessary procedures" (page 23 of the CON application) Health Utilization Management services that provide pre-authorization services also began to be more widely used during this time period and have contributed to a decline in nuclear cardiology imaging procedures. A number of published reports (Saifi *et al* in JACC Imaging from July, 2013, and Gibbons *et al* in the American Heart Journal from March, 2010) and have demonstrated that new appropriate use guidelines and training practitioners about appropriate use criteria reduces the number of inappropriate tests ordered which would be seen in a reduction in the overall volume of tests. The effect of the cardiac imaging pre-approval process is direct in that a nuclear cardiology study that is not pre-approved will not be paid for, and therefore, will not be performed.

There are a number of alternative non-invasive cardiac diagnostic procedures to nuclear cardiology which have grown in the past 5 years. These include stress echocardiography, cardiac CT angiography, and stress cardiac MRI. The Advisory Board article submitted with the CON application (page 30) states that surrogate technologies have emerged which can potentially replace nuclear myocardial perfusion imaging, namely cardiac CT angiography and cardiac MRI. Cardiac CT can be used to triage chest pain patients to determine the need for coronary angiography thus taking the place of SPECT imaging and cardiac MRI is comparable to SPECT myocardial perfusion imaging for heart disease diagnosis. Stress echocardiography is another type of stress test that is comparable to SPECT myocardial perfusion imaging in the diagnosis of ischemic heart disease.

Please see Exhibit 1 for copies of the articles referenced above.

2. Although the Hospital states that declining numbers are one of the reasons to terminate the nuclear cardiology imaging services at the five locations, two of the locations do not report declining volumes. Provide additional discussion on the declining volumes of nuclear cardiology imaging services as a whole and at each location.

Applicant's Response.

Provided below is a revised Table A which has been updated to include actual volume by site from FY 2011 through FY2014. Consistent with national trends, overall nuclear cardiology imaging volume has declined by 34% from FY 2011to FY 2014. Although the percentage decrease varies site by site, the overall volume trend is downward.

Overall volume losses for the three locations with declining volumes, Nuclear Cardiology Glastonbury, Nuclear Cardiology Retreat Avenue and Nuclear Cardiology BlueBack Square, were 53% from FY2011 to FY2014. These three sites were open 5 days a week in established practice locations.

Two of the five practice sites, Nuclear Cardiology Avon and Nuclear Cardiology Farmington, experienced slight volume increases from FY 2011 to FY 2014. However, upon closer examination, volume trends at Avon and Farmington are down since FY 2012 and FY 2013 respectively. The Avon and Farmington locations have been in the process of establishing a greater practice presence and have increased the number of days per week performing nuclear cardiology imaging procedures in 2013 and 2014. Despite greater availability of the service, continued downward pressure on volume at these sites is expected. Neither the Avon nor the Farmington site is immune from changes resulting from evolving physician practice patterns and the continued development of appropriate use criteria for nuclear cardiology imaging services.

Nuclear Cardiology Patient Volumes by Service Location

Physicia Practice Site	Practice Address	Patient Volumes FY 2011	FY 2012	FY 2013	FY 2014	FY2011-FY2014 Change	FY2011-FY2014 % Change
Nuclear Cardiology Avon	100 Simsbury Road	122	189	164	168	46	38%
Nuclear Cardiology Glastonbury	703 Hebron Avenue	337	360	221	153	-184	-55%
Nuclear Cardiology Retreat Avenue	100 Retraet Avenue	622	643	466	289	-333	-54%
Nuclear Cardiology BlueBack Square	65 Memorial Road	225	235	150	114	-111	-49%
Nuclear Cardiology Farmington	21 South Road	145	160	254	235	90	62%
		1,451	1,587	1,255	959	(492)	-34%

Revised Table A

3. Explain what is meant by the phrase "desire to better utilize and allocate Hospital resources" when stating the reasons for terminating the nuclear cardiology imaging services.

Applicant's Response:

The phrase "desire to better utilize and allocate Hospital resources" refers to Hartford Hospitals' commitment to utilize existing resources in the most cost efficient and effective manner. Fixed costs to run each location include the cost of the space, camera maintenance and upkeep, and personnel salaries. If locations are not operating at optimum capacity these resources are not being efficiently utilized.

In reference to the five outpatient hospital satellites for nuclear cardiology, each of which have small and declining patient volume, the most effective and cost efficient use of hospital resources is to consolidate and centralize the services offered. As mentioned in the CON application, nuclear cardiology imaging services will continue to be provided at the main campus of Hartford Hospital.

4. Report the number of patients by town separately for each location. For FY 2014, provide the number of patients through September 30 at a minimum. Please use the following format:

Applicant's Response:

Please see Exhibit 2 for patient volume by town for each of the five sites.

5. List the towns from the table above that are included in the Hospital service area.

Applicant's Response:

Except as otherwise noted in red on the attached schedules, all patient volume is from Hartford Hospital's service area towns.

6. Table 5 on page 13 of the application reports the number of persons that received nuclear cardiology imaging services in the current year. According to the Hospital's proposal, these patients will be receiving their future cardiac imaging at a non-Hospital based provider. Please review and update the information reported in Table 5 for the following:

a. Identify the projected fiscal years that are reported.
b. If these are Hospital patients, where will the patients be receiving their cardiac imaging services?
c. Explain why the projected numbers are the same for each payer for each year.

Applicant's Response (a):

The most recently completed fiscal year is FY 2014. The Projected payer mix is for FY 2015, FY 2016 and FY 2017. Please see updated Table below.

Applicant's Response (b):

Currently nuclear cardiology imaging services at each of the five outpatient satellite locations are provided by Hartford Hospital. The Hospital is seeking approval to discontinue providing these services which in the future will be provided by the private cardiology practices. The patients currently served by Hartford Hospital are the patients of the private cardiology practices at each location.

Avon- Two private practice cardiology groups, Connecticut MultiSpecialty Group and Consulting Cardiology, P.C., have office locations at this site. Consulting Cardiology, PC, will continue to provide nuclear cardiology imaging services for patients at this location.

Farmington and Retreat Avenue – Cardiology P.C. will continue to provide nuclear cardiology imaging services at the Farmington location. Cardiology P.C. patients from both the Retreat Avenue practice location and the Farmington practice location will be served from the Farmington office location.

Blue Back Square and West Hartford – Connecticut MultiSpecialty Group will discontinue offering nuclear cardiology imaging services at their Blue Back Square and Glastonbury

practice locations. Patients will be directed to their Wethersfield practice location to receive these services.

Please see chart below.

If patients prefer, they can receive these services at the main campus of Hartford Hospital, although it is anticipated that the majority of patients will continue to receive nuclear cardiology imaging at their physician practice location.

Current Location	Future Location	Practice
Nuclear Cardiology Avon 100 Simsbury Road Avon, Connecticut 06001	Nuclear Cardiology Avon 100 Simsbury Road Avon, Connecticut 06001	Consulting Cardiology
Nuclear Cardiology Glastonbury 703 Hebron Avenue Glastonbury, CT 06033	CMG 1260 Silas Deane Hwy Wethersfield, CT	Connecticut MultiSpecialty Group
Nuclear Cardiology Retreat Ave 100 Retreat Avenue, Suite #811 Hartford, Connecticut 06106	Nuclear Cardiology Farmington 21 South Road Farmington, CT 06032	Cardiology PC
Nuclear Cardiology Blue Back Square 65 Memorial Road West Hartford, CT 06107	Connecticut MultiSpecialty Group 1260 Silas Deane Hwy Wethersfield, CT	Connecticut MultiSpecialty Group
Nuclear Cardiology Farmington 21 South Road Farmington, CT 06032	Nuclear Cardiology Farmington 21 South Road Farmington, CT 06032	Cardiology PC

Applicant's Response (c): Please see updated Table below.

	Most Recently Completed FY**		Projected					
			FY**		FY**		FY**	
	Volume	%	Volume	%	Volume	%	Volume	%
Medicare*	590	55%	590	55%	590	55%	590	55%
Medicaid*	11	1%	11	1%	11	1%	11	1%
CHAMPUS & TriCare								
Total Government	**601**	**56%**	**601**	**56%**	**601**	**56%**	**601**	**56%**
Commercial Insurers	454	42%	454	42%	454	42%	454	42%
Uninsured	21	2%	21	2%	21	2%	21	2%
Workers Compensation								
Total Non-Government	**475**	**44%**	**475**	**44%**	**475**	**44%**	**475**	**44%**
Total Payer Mix	**1076**	**100%**	**1076**	**100%**	**1076**	**100%**	**1076**	**100%**

Payer mix for 5 Hartford Hospital satellite locations.

Payer	Most Recently Completed FY2014		Projected					
			FY2015		FY2016		FY2017	
	Volume	%	Volume	%	Volume	%	Volume	%
Medicare*	1062	49%	472	43%	473	43%	473	43%
Medicaid*	203	9%	192	17%	192	17%	192	17%
CHAMPUS & TriCare								
Total Government	**1265**	**58%**	**664**	**60%**	**665**	**60%**	**665**	**60%**
Commercial Insurers	843	39%	389	35%	389	35%	389	35%
Uninsured	77	3%	56	5%	56	5%	56	5%
Workers Compensation								
Total Non-Government	**920**	**42%**	**445**	**40%**	**445**	**40%**	**445**	**40%**
Total Payer Mix	**2185**	**100%**	**1109**	**100%**	**1109**	**100%**	**1109**	**100%**

Payer mix for all nuclear cardiology services at Harford Hospital showing the impact of discontinuing the service at five satellite locations for FY 2015, 2016 and 2017.

7. How long will it be until the private cardiology physician practices in Avon and Farmington will purchase SPECT myocardial perfusion imaging cameras and begin providing services at these two locations?

Applicant's Response:

It is expected that the private cardiology practices at the Avon and Farmington locations will purchase the existing SPECT myocardial perfusion imaging cameras as soon as the state CON is granted and begin to independently provide services as soon as they have obtained any required licenses..

8. Describe the nuclear cardiology imaging services and the alternative testing modalities that the Hospital will provide to patients and where they will be provided should the Hospital's proposal be implemented.

Applicant's Response:

It is anticipated that the majority of patients will receive future nuclear cardiology imaging services at their private cardiologist's office. However, if a patient prefers a hospital setting Hartford Hospital offers nuclear cardiology imaging including stress tests and echocardiography services on the main campus. See response to Question 6(b) above.

Alternative noninvasive cardiac diagnostic tests to nuclear cardiology procedures that are currently available at the private practices include stress echocardiography. Alternative noninvasive cardiac diagnostic tests to nuclear cardiology procedures that are currently available at Hartford Hospital include stress echocardiography and cardiac CT angiography.

9. Explain how the proposal will improve cost-effectiveness in the region. (See Question 5b on page 14.) How will the proposal affect the rates charged for the nuclear cardiology imaging services under the Hospital and under the private physician practices?

Applicant's Response:

Currently, Hartford Hospital submits charges for the technical component of the myocardial perfusion imaging study (performing the SPECT imaging)and the private cardiology practice submits charges for the professional component of the myocardial perfusion imaging study (interpreting the images) as well as the global charges for the stress test (performance and interpretation of the test).

There will be no change in the rates charged for nuclear cardiology procedures performed at Hartford Hospital as a result of these changes.

For nuclear cardiology procedures performed at the private practices, the private practices will bill globally for the myocardial perfusion imaging procedure without a hospital

component to the bill. This would remove any facility fee normally imposed by Hartford Hospital. Also, the "cost" of the procedure is lower in a private office than in a hospital outpatient setting based on Medicare reimbursement. For non-Medicare patients, the difference in "cost" varies with various private insurances.

Appendix:

Provide a list of the physician practice names and addresses of office locations (whether or not nuclear cardiac imaging services are available).

Applicant's Response: See Table below.

Physician Practice Name	Practice Address
1. Cardiology P.C.	100 Retreat Avenue, Harford CT. 06106 11 South Road , Farmington, CT 06032
2. Connecticut Multispecialty Group	100 Simsbury Road, Avon, CT. 06001 533 Cottage Grove Road, Bloomfield, CT 478 Burnside Ave, East Harford, CT 06108 9 Cranbrook Boulevard, Enfield, CT 06082 11 South Rd, Farmington, CT 06032 704 Hebron Ave., Glastonbury, CT 06033 703 Hebron Ave., Glastonbury, CT 06033 85 Seymour Street, Hartford, CT 06106 47 East Main Street, Stafford Springs, CT06076 384 Merrow Road, Tolland, CT06084 65 Memorial Road, West Hartford, CT 06110 1260 Silas Deane Highway, Wethersfield, CT 06109
3. Consulting Cardiology, PC	85 Seymour St, Ste 719, Hartford, CT 06106 305 Western Blvd, Ste 100, Glastonbury, CT 06033 100 Simsbury Rd, Avon, CT 06001 631 South Quaker Lane, West Hartford, CT 06110 256 North Main Street, Manchester, CT 06040 74 Mack Street, Windsor, CT 06095 100 Hazard Avenue, Enfield, CT 06082 1025 Silas Deane Highway, Wethersfield, CT 06109

Exhibit 1

Copies of Studies Submitted in Support of Declining Utilization Trends

1. David C. Levin, MD, et al, "Recent Reimbursement Changes and Their Effect on Hospital and Private Office Use of Myocardial Perfusion Imaging", The Journal of the American College of Radiology, March 2013
2. Samira Saifi, MHA et al, "The Use of a Learning Community and Online Evaluation of Utilization for SPECT Myocardial Perfusion Imaging", The Journal of the American College of Cardiology, July 2013
3. Raymond J. Gibbons, MD, et al, "Temporal trends in compliance with appropriateness criteria for stress single-phoyon emission computed tomograpghy sestamibi studies in an academic medical center", the American Heart Journal, March 2010

Temporal trends in compliance with appropriateness criteria for stress single-photon emission computed tomography sestamibi studies in an academic medical center

Raymond J. Gibbons, MD,[a] J. Wells Askew, MD,[a] David Hodge, MSc,[b] and Todd D. Miller, MD[a] *Rochester, MN*

Background The purpose of this study was to apply published appropriateness criteria for single-photon emission computed tomography (SPECT) myocardial perfusion imaging (MPI) in a single academic medical center to determine if the percentage of inappropriate studies was changing over time. In a previous study, we applied the American College of Cardiology Foundation/American Society of Nuclear Cardiology (ASNC) appropriateness criteria for stress SPECT MPI and reported that 14% of stress SPECT studies were performed for inappropriate reasons.

Methods Using similar methodology, we retrospectively examined 284 patients who underwent stress SPECT MPI in October 2006 and compared the findings to the previous cohort of 284 patients who underwent stress SPECT MPI in May 2005.

Results The indications for testing in the 2 cohorts were very similar. The overall level of agreement in characterizing categories of appropriateness between 2 experienced cardiovascular nurse abstractors was good (κ = 0.68), which represented an improvement from our previous study (κ = 0.56). There was a significant change between May 2005 and October 2006 in the overall classification of categories for appropriateness (P = .024 by χ^2 statistic). There were modest, but insignificant, increases in the number of patients who were unclassified (15% in the current study vs 11% previously), appropriate (66% vs 64%), and uncertain (12% vs 11%). Only 7% of the studies in the current study were inappropriate, which represented a significant (P = .004) decrease from the 14% reported in the 2005 cohort.

Conclusions In the absence of any specific intervention, there was a significant change in the overall classification of SPECT appropriateness in an academic medical center over 17 months. The only significant difference in individual categories was a decrease in inappropriate studies. Additional measurements over time will be required to determine if this trend is sustainable or generalizable. (Am Heart J 2010;159:484-9.)

The growing national discussion surrounding health care reform has focused attention on the rapid increase in imaging services provided to Medicare beneficiaries in recent years.[1] A cross-sectional, population-based study of Medicare beneficiaries between 1993 and 2001 reported that the average annual increase in cardiac imaging stress tests (stress single-photon emission computed tomographic [SPECT] studies and stress echocardiograms) was 6.1%, compared to 2.0% for cardiac catheterization and 0.8% for percutaneous coronary intervention (PCI).[2] Noncardiac imaging has shown even more dramatic increases. The Officer of the Inspector General reported to Medicare that "high-technology imaging," that is, magnetic resonance imaging, computed tomography, and positron emission tomography had increased almost 4-fold between 1995 and 2005, an average annual increase of about 16% per year.[3]

In response to this societal concern, the American College of Cardiology Foundation (ACCF) began an effort in 2005 to develop appropriateness criteria for imaging studies.[4] Criteria have now been published for SPECT myocardial perfusion imaging (MPI),[5] cardiac computed tomography and magnetic resonance imaging,[6] rest echocardiography,[7] and stress echocardiography.[8] More recently, appropriateness criteria have also been expanded to percutaneous intervention and coronary artery bypass surgery,[9] and a revision has been published of the original SPECT criteria.[10] An earlier study from this laboratory[11] applied the ACCF appropriateness criteria for stress SPECT imaging to 284 patients who underwent

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0002-8703/$ - see front matter

doi:10.1016/j.ahj.2009.12.004

stress SPECT imaging at Mayo Rochester between May 1, 2005, and May 15, 2005 (before the publication of the ACCF appropriateness criteria). We reported that 14% of stress SPECT studies performed in those 2 weeks were for inappropriate indications and suggested that quality improvement efforts were merited to reduce the number of inappropriate studies and improve efficiency in the health care system. However, before we released the results of our study internally at Mayo Rochester in January 2007 as part of a quality improvement effort, we sought to determine whether the rate of inappropriate studies might already be changing as a result of publication of the ACCF SPECT MPI appropriateness criteria and increasing discussion (both internal and external) of the need for overall health care reform. The purpose of this study was therefore to assess the reproducibility of our earlier findings in a similar 2-week period during the fall of 2006, approximately 1 year after publication of the ACCF criteria, and 17 months after our earlier study.

Methods

Overall study design

The general methodology used in this study was nearly identical to our earlier study,[11] to minimize variability due to changing methodology, except where specifically noted below.

Database

The Mayo Rochester (MN) Nuclear Cardiology Laboratory maintains a prospective database on all patients undergoing stress radionuclide procedures, which includes a record of symptoms of chest pain or dyspnea at the time of testing, and a categorization of chest pain as typical angina, atypical angina, or noncardiac pain, using the criteria of Diamond.[12] The database has been used extensively in previous publications,[13] including our initial study on appropriateness.[11]

Assumptions

As reported previously, we used a number of assumptions to apply the appropriateness criteria in a standardized fashion.

1. Patients whose primary symptom was dyspnea rather than chest pain were regarded as symptomatic with "atypical angina."
2. For asymptomatic patients without known coronary artery disease, we used the Framingham score that is appropriate to determine the risk of future cardiac death or myocardial infarction.[14] Patients who were on statin therapy for hyperlipidemia were assigned a value of +2 for the low-density lipoprotein cholesterol component of the score.
3. The patient's exercise tolerance was assessed from the clinical notes. Based on the experience of our earlier study, "normal exercise tolerance" of ≥4 METs (metabolic equivalent) required documentation that the patient could climb 2 flights of stairs without difficulty, walk briskly on the level ground for at least 15 minutes, or participate in athletic activities such as bicycling. Although the ability to climb 2 flights of stairs is routinely requested on the Mayo questionnaire, it is not consistently answered by all patients.
4. Minimally invasive surgical procedures such as endoscopic inguinal hernia repair that were not specifically listed in the American College of Cardiology/American Heart Association preoperative testing guidelines[15] were generally regarded as "low risk."
5. Patients who could be considered under different indications within the same table of the appropriateness criteria that would assign them to different levels of appropriateness were regarded as "unclassified."
6. If the patient had both prior PCI and prior coronary artery bypass grafting, only the most recent revascularization procedure was considered for classification purposes.
7. We applied the multiple tables of the appropriateness criteria in the same sequential order as reported in our earlier study.
8. Because of the difficulty experienced by our cardiovascular study nurses in applying the appropriateness criteria for follow-up testing (which was reflected in a much lower κ value for that group in our original study), we developed a grid that considered the stability of symptoms, the normal or abnormal findings on a prior SPECT study, and the interval since prior testing to guide the nurses (Table I).

Final study group

The final study group consisted of all patients who underwent stress SPECT sestamibi studies at Mayo Clinic Rochester from October 1, 2006, to October 15, 2006 (following the publication of the ACCF criteria in September 2005 and preceding internal release of the findings of our first study). We used the same exclusions used in our first study.

1. Patients who did not grant research authorization under Minnesota state law (3 from the current 2006 cohort and 6 from the previous 2005 cohort).
2. Patients who underwent SPECT stress studies at off-site locations within the Mayo Regional Health System as part of our outreach program.

Patient classification

Each patient was classified independently by the same 2 experienced cardiovascular nurse abstractors who had participated in our first study . These nurses were not affiliated with the nuclear cardiology laboratory. Patients who did not qualify under the existing 47 indications were considered unclassified. Patients who qualified under one of the existing indications were classified as appropriate, uncertain, or inappropriate.

If the 2 nurse assessments agreed, their classification was final. If they did not, discrepancies were settled by a single staff nuclear cardiologist (R.J.G.). In our original study, a consensus of 2 staff physicians was used; on the basis of our previous experience, we felt that this procedure could be simplified without sacrificing consistency. The results that follow represent the final classification of each patient.

Statistical analysis

The 2 nurses were compared in their classification of the patients using κ statistics. The χ^2 test for independence was

Table I. Application of appropriate criteria for patients with prior SPECT study

Symptoms	Prior SPECT*	Framingham risk category	Interval	Indication	Appropriateness category
Worsening	Normal	–	–	None	Unclassified
Worsening	Abnormal	–	–	25	A
Asym/stable	Normal	High	<15 m	21	I
Asym/stable	Normal	High	15-24 m	None	Unclassified
Asym/stable	Normal	High	>24 m	22	A
Asym/stable	Normal	Intermediate	–	None	Unclassified
Asym/stable	Normal	Low	–	None	Unclassified
Asym/stable	Abnormal	–	<1 y	23	I
Asym/stable	Abnormal	–	1-2 y	None	Unclassified
Asym/stable	Abnormal	–	>2 y	24	A

Indication number is from ACCF/ASNC SPECT MPI appropriateness criteria. *A*, Appropriate; *Asym*, asymptomatic; *I*, inappropriate.
*"Normal" or "probably normal" with diaphragmatic/breast attenuation, electrocardiogram changes, or symptoms should be interpreted as "normal" for this table.

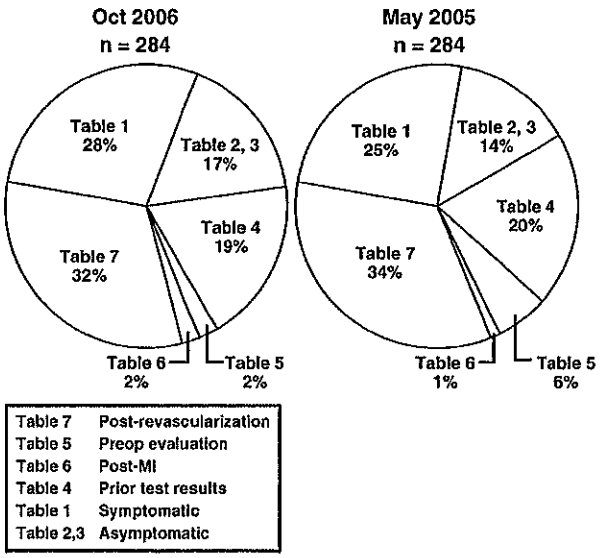
Table II. Patient characteristics

	Current study	Previous study
Dates	October 2006	May 2005
Age (y)	68 ± 11	67 ± 11
Women	33%	37%
Diabetes	27%	27%
Hypertension	68%	71%
Hyperlipidemia	78%	78%
Smoking history	54%	48%
Prior myocardial infarction	19%	20%
Prior PCI or coronary artery bypass graft	32%	34%
Dyspnea	17%	20%
Rest electrocardiogram normal	32%	31%
Body mass index ≥30 kg/m^2	39%	41%

used to compare categorical factors. The results of the current study and the previous study were compared using the χ^2 test, and post hoc unpaired *t* tests where appropriate.

The study was approved by the Mayo Institutional Review Board. No extramural funding was used to support this work. The authors are solely responsible for the design and conduct of this study, all study analyses, the drafting and editing of the article, and its final contents.

Figure 1



Distribution of general indications for stress SPECT MPI, according to the ACCF/ASNC appropriateness criteria, for the current study (left diagram) and previous study (right diagram). *MI*, Myocardial infarction.

Results

General

There were 284 eligible stress SPECT myocardial perfusion image patients between October 1, 2006, and October 15, 2006. (Although this number agrees exactly with the number of patients in our previous study, it occurred by chance alone, and not by design). Their demographics are shown in Table II and compared to the demographics for the cohort in our original study. There were no significant differences between the 2 cohorts in age, gender, risk factors, or cardiac history.

Indication for testing

The indications for testing for the stress SPECT MPI (following the sequential application of the appropriateness criteria tables described above) are shown in Figure 1. Similar percentages of the patients from the current study and the previous study were referred for testing postrevascularization (32% and 34%, respectively) and for follow-up testing after prior SPECT MPI (19% and 20%, respectively). A similar percentage of both groups were referred to evaluate symptoms (28% and 25%, respectively) and to screen for suspected coronary

Table III. Agreement between 2 cardiovascular nurse abstractors on overall patient classification (n = 384)

	Nurse no. 1			
Nurse no. 2	**Unclassified**	**Appropriate**	**Uncertain**	**Inappropriate**
Unclassified	28	4	2	2
Appropriate	16	168	2	5
Uncertain	7	2	15	3
Inappropriate	4	1	1	24

$\kappa = 0.68$.

artery disease in asymptomatic patients without other indications (17% and 14%, respectively).

Observer agreement

The agreement between the 2 cardiovascular nurses is shown in Table III. The overall level of agreement was good with a κ of 0.68. This represented an improvement from the κ of 0.56 that we reported in our original study.

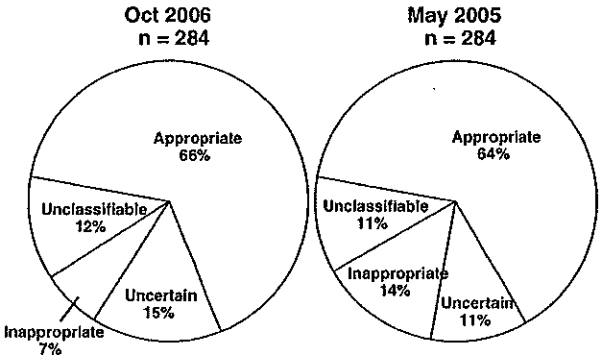
Overall appropriateness

The overall classification of the stress SPECT studies in the current study and the previous study is shown in Figure 2. There was a significant change in the overall classification for appropriateness (P = .024 by χ^2 statistic). In the current study, there were modest increases in the number of patients who were uncertain (15% [95% CI 11%-20%] vs 11% [95% CI 8%-15%]), appropriate (66% [95% CI 60%-72%] vs 64% [95% CI 58%-70%]), and unclassifiable (12% [95% CI 8%-16%] vs 11% [95% CI 7%-15%]); none of these differences were significant. The only significant difference regarding classification was for inappropriate studies, which were 7% (95% CI 4%-11%) in the current study, decreased from 14% (95% CI 11%-19%) in our previous study (P = .004).

Inappropriate studies

The inappropriate studies are tabulated in Table IV according to the indications for testing, as defined in the ACCF/American Society of Nuclear Cardiology (ASNC) SPECT MPI appropriateness criteria. Compared to our previous study, the number of inappropriate patient studies decreased for every inappropriate indication, although the number of patients in each individual category was small. The largest absolute decrease occurred in the testing of asymptomatic individuals who were low risk by Framingham criteria; there were 20 such inappropriate studies in our previous study, compared to only 11 in the current study. The largest decrease in percentage terms occurred in the testing of patients who were asymptomatic <1 year after PCI (and who had symptoms before their intervention); there were 5 such inappropriate studies previously, which decreased by 80% to a single inappropriate study in the current study.

Figure 2



Overall classification of category of appropriateness, according to the ACCF/ASNC criteria, for the current study (left diagram) and the previous study (right diagram).

Discussion

This study applied the 2005 ACCF/ASNC appropriateness criteria for SPECT MPI to our clinical practice in an academic medical center. It used nearly the same methodology as our previous study on this subject in an effort to determine whether the percentage of inappropriate studies might be changing within our practice as a result of publication of the ACCF/ASNC SPECT MPI appropriateness criteria and increasing discussion (both within Mayo Rochester and externally) of the need for overall health care reform. This assessment of temporal trends was performed before the initiation of an internal quality improvement effort to reduce the rate of inappropriate studies. We were surprised to find a significant change in the overall classification of SPECT appropriateness, which was related to a decrease in inappropriate SPECT studies within our practice. As shown in Table IV, the number of studies performed for each inappropriate indication declined between these 2 time points.

We do not believe that this change in appropriateness is explained by any change in methodology, as we were careful to perform the studies in a very similar fashion,

Table IV. Inappropriate studies by indication

Indication	Description	Current study	Previous study
10	Asymptomatic, low Framingham risk	11	20
47	Asymptomatic <1 y after PCI with prior symptoms	1	5
23	Recent abnormal SPECT, stable symptoms	2	5
1	Symptomatic, low pretest probability Interpretable electrocardiogram, able to exercise	4	5
32	Preoperative, interrisk surgery Good exercise capacity	1	4
31	Preoperative, low-risk surgery	1	2
		20 (7%)	41 (14%)

using the same assumptions to apply the appropriateness criteria. The same 2 cardiovascular study nurses evaluated the patient data. The only changes in methodology were the use of a grid (Table I) to guide the study nurses in applying the appropriateness criteria for follow-up testing (which they found very difficult in our original study) and the use of a single staff physician rather than a pair of staff physicians, to resolve differences between the 2 cardiovascular study nurses. Agreement between the 2 nurses did improve, reflecting either the use of Table I or increased experience in this type of study. Neither the cardiovascular nurses nor the single staff physician who resolved discrepancies had any preconceived expectation regarding the outcome of this study and had little reason to expect a decrease in the rate of inappropriate studies. This was viewed as a "reproducibility study" to establish a more contemporary baseline immediately before the initiation of our internal quality improvement effort.

The timing of this follow-up cohort (October 2006) was intentionally selected to avoid any effect of our previous study. The results of that study were not available to the investigators until November 2006 and not presented internally at Mayo until January 2007. The findings of the previous study could therefore not have affected the Mayo clinical practice.

Although overall changes in the clinical practice of the use of SPECT MPI might have impacted on appropriateness, there is no evidence to support this possibility. Although we did not tabulate the identity of each of the ordering physicians during these 2 periods, there was no change in the customarily low staff turnover at the Mayo Clinic in 2005 or 2006. The overall volume of SPECT studies investigated during these 2 periods was identical. Although this was a chance finding, it does confirm a similar overall rate of SPECT use within the Mayo practice. As shown in Figure 1, the general indications for testing during these 2 periods were virtually identical.

One possible explanation for the reduction in inappropriate studies was the internal discussion at Mayo Rochester during 2006 regarding the need for national health care reform and for improved efficiency in health care delivery. The Mayo Health Policy Center[16] held its first national forum in Rochester, MN, in May 2006, and Mayo staff were invited to attend the sessions or observe the sessions from a number of satellite locations on the Mayo campus. These discussions may have influenced Mayo staff and reduced the number of inappropriate studies.

Another potential explanation is the national publication by the ACCF/ASNC of the appropriateness criteria themselves.[5] The publication was accompanied by considerable publicity by both organizations. We do not know how many staff physicians at Mayo read the publication or were exposed to this publicity, but this may have been a factor in the reduction of inappropriate studies. However, most studies were ordered by internists or cardiologists not affiliated with the nuclear cardiology laboratory, who were probably less likely to read the publications.

Nationally, the rapid growth in SPECT studies is reported to have stopped (and even reversed slightly) in 2006 for uncertain reasons.[17]

Regardless of the reason for the change in appropriateness, it does not appear to be accidental. We do not know at this time whether this trend is sustainable. We intend to examine the short-term durability of this trend within the near future.

Although the increase in the unclassified patients was not significant, it confirms our earlier identification of some of the limitations of the appropriateness criteria. For example, there are appropriateness categories for calcium scores of <100 and calcium scores of >400 but none for calcium scores of between 100 and 400. Similarly, there are criteria for patients studied within 1 year of PCI and patients studied >2 years after PCI, but there is no category for a patient studied between 1 and 2 years after PCI.

Our findings do have implications for any systematic quality improvement efforts on either a single-center or multicenter basis to reduce the percentage of inappropriate SPECT studies. The findings of this study suggest that internal and external factors that are not part of such a project may impact on the ordering of inappropriate studies. Quality improvement efforts should therefore ideally include a contemporary control group to test these "other effects" to make certain that the quality

improvement project itself is responsible for the observed effects on inappropriate studies. Unfortunately, such a control group was not feasible in the design of our subsequent Mayo Rochester quality improvement effort. We expect that this will prove to be similarly difficult for other single-center and multicenter quality improvement projects. Our results suggest that this must be recognized as a limitation of any quality improvement effort that does not include a control group.

A major limitation of this study is its performance at a single academic medical center, where all of the ordering physicians, and the stress laboratory physicians, are salaried Mayo staff with no direct financial stake in the imaging equipment or financial incentive to perform additional tests. The results may therefore not be generalizable to other settings. Our overall sample size, and particularly the number of patients with inappropriate studies, was relatively modest, but this reflected the logistics of performing rigorous analysis of the data by 2 separate cardiovascular study nurses and adjudication of differences by a staff physician. We did not calculate a sample size to detect differences, as our intent was only to assess the overall reproducibility of our earlier results in a similar size cohort. Our 2 samples were obtained at different times of the year, which may have influenced the results. It must be recognized that incomplete documentation may certainly explain some of the inappropriate studies, which is a recognized limitation in many evaluations of the quality of care.

Despite these limitations, our data demonstrate that there was a significant change in overall SPECT appropriateness in an academic medical center in a 17-month period without any specific internal intervention. We intend to perform additional analyses to determine if this trend is durable.

Disclosures

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References

1. Iglehart JK. The new era of medical imaging-progress and pitfalls. N Engl J Med 2006;354:2822-8.
2. Lucas FL, DeLorenzo MA, Siewers AE, et al. Temporal trends in the utilization of diagnostic testing and treatments for cardiovascular disease in the United States, 1993-2001. Circulation 2006;113: 374-9.
3. Levinson DR. Growth in advanced imaging paid under the Medicare physician fee schedule. Available at: http://oighhsgov/oei/reports/oei-01-06-00260pdf. Last accessed 3-11-08.
4. Patel M, Spertus J, Brindis RG, et al. ACCF proposed method for evaluating the appropriateness of cardiovascular imaging. JACC 2005;46:1606-13.
5. Brindis RG, Douglas PS, Hendel RC, et al. ACCF/ASNC appropriateness criteria for single-photon emission computed tomography myocardial perfusion imaging (SPECT MPI). J Am Coll Cardiol 2005; 46:1587-605.
6. Hendel RC, Patel MR, Kramer CM, et al. ACCF/ACR/SCCT/SCMR/ASNC/NASCI/SCAI/SIR 2006 appropriateness criteria for cardiac computed tomography and cardiac magnetic resonance imaging. J Am Coll Cardiol 2006;3:751-71.
7. Douglas PS, Khandheria BK, Stainback RF, et al. ACCF/ASE/ACCP/ACEP/AHA/ASNC/HFSA/HRS/SCAI/SCCT/SCCM/SCMR appropriateness criteria for transthoracic and transesophageal echocardiography. J Am Coll Cardiol 2007;20:787-805.
8. Douglas PS, Khandheria BK, Stainback RF. ACCF/ASE/ACEP/AHA/ASNC/SCAI/SCCT/SCMR 2008 appropriateness criteria for stress echocardiography. J Am Coll Cardiol 2008;51:1127-47.
9. Patel MR, Dehmer GJ, Hirshfeld Jr JW, et al. ACCF/SCAI/STS/AATS/AHA/ASNC 2009 appropriateness criteria for coronary revascularization: a report of the American College of Cardiology Foundation Appropriateness Criteria Task Force, Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, American Association for Thoracic Surgery, American Heart Association, and the American Society of Nuclear Cardiology: Endorsed by the American Society of Echocardiography, the Heart Failure Society of America, and the Society of Cardiovascular Computed Tomography. Circulation 2009;119: 1330-52.
10. Hendel RC, Berman D, De Carli MF, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide imaging. JACC 2009;53:2201-29.
11. Gibbons RJ, Miller TD, Hodge DO, et al. Application of appropriateness criteria to stress SPECT sestamibi studies and stress echocardiogram in an academic medical center. J Am Coll Cardiol 2008;51:1283-9.
12. Diamond GA. A clinically relevant classification of chest discomfort. JACC 1983;1:574-5.
13. Poornima IG, Miller TD, Christian TF, et al. Utility of myocardial perfusion imaging in patients with low-risk treadmill scores. J Am Coll Cardiol 2004;43:194-9.
14. Risk assessment tool for estimating 10-year risk of developing hard CHD (myocardial infarction and coronary death. Available at: http://hp2010.nhlbihin.net/atpiii/calculator.asp?usertype=prof. Last accessed 8/1/2009.
15. Eagle KA, Berger PB, Calkins H, et al. ACC/AHA guideline update for perioperative cardiovascular evaluation for noncardiac surgery—executive summary a report of the American College of Cardiology/American Heart Association Task Force on Practice guidelines (Committee to Update the 1996 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery). JACC 2002;39: 542-53.
16. http://mayoweb.mayo.edu/healthcare-reform/documents/ExecutiveSummaryMarch06.pdf. Last accessed September 1, 2009.
17. Shaw LJ, Min JK, Hachamovitch R, Peterson ED, Hendel RC, Wood PK, Berman DS, Douglas PS. Cardiovascular imaging research at the crossroads. JACC Cardiovasc Imag (in press).

Recent Reimbursement Changes and Their Effect on Hospital and Private Office Use of Myocardial Perfusion Imaging

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Purpose: The aims of this study were to examine recent trends in the utilization of radionuclide myocardial perfusion imaging (MPI) and to reflect on their causes and their implications for radiologists.

Methods: Nationwide Medicare Part B databases for 2000 through 2010 were used. Codes for primary MPI studies (including PET) were selected. Medicare specialty codes were used to identify MPI examinations done by radiologists, cardiologists, and other physicians. Place-of-service codes were used to identify examinations performed in offices versus hospital settings. Utilization rates per 1,000 fee-for-service beneficiaries were calculated. Trends were assessed by place of service and specialty.

Results: The overall MPI utilization rate rose from 2000 through 2004, followed by a period of stabilization from 2005 to 2008. A peak of 88.0 per 1,000 was reached in 2006. In 2009 and 2010, a decline occurred, with the rate dropping by 13% to 76.9. In private offices, cardiologists' utilization grew rapidly from 2000 through 2006, but growth stopped thereafter. Their rate peaked in 2008 at 50.6 but dropped to 44.4 by 2010 (−12%). Radiologists' role in office MPI was minimal. In hospital settings, radiologists predominated in 2000. Their rate remained stable through 2004 but thereafter began to decline steadily, dropping by 35% by 2010. Cardiologists' hospital-based utilization rate rose gradually, then flattened, but began to rise in 2009 and 2010. By 2010, cardiologists performed more hospital MPI examinations than radiologists.

Conclusions: Radiologists' initially predominant role in hospital-based MPI has eroded recently, while that of cardiologists has strengthened. This seems related to a shift among cardiologists away from office practice and into hospital affiliations.

Key Words: Medical economics, myocardial ischemia, myocardial perfusion imaging, advanced imaging, radiology and radiologists, socioeconomic issues

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Radionuclide myocardial perfusion imaging (MPI) is a widely used test in patients with known or suspected coronary artery disease. There is concern that it is expensive and a source of radiation exposure to the population. It accounts for a large majority of all nuclear medicine examinations. In approximately 25% of cases, its use is either inappropriate or of uncertain appropriateness [1-3]. Many MPI examinations are self-referred by cardiologists, which can lead to a potential conflict of interest. For all these reasons, utilization patterns of this technology are of interest to those who determine health policy and pay for health care. Previous studies have shown that among Medicare beneficiaries, utilization rates of MPI rose sharply from 1998 through 2006 [4,5] and that most of the increase was attributable to cardiologists who installed nuclear cameras in their offices. In contrast, its use in hospital settings (inpatients, hospital outpatient facilities, and emergency departments) had grown much more slowly. In 1998 in these hospital settings, radiologists did more than twice the number done by cardiologists. By 2006, the gap had narrowed, but radiologists still did the majority of the hospital-based MPI scans.

In the past few years, major changes have occurred within the cardiology community. Many cardiologists who had previously been in private office practices sold their practices

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to hospitals or merged with them [6-8]. The impetus for this was reductions in reimbursements, particularly those for noninvasive cardiac imaging studies such as echocardiography and MPI. In performing MPI examinations before 2010, it had been common practice for physicians to submit claims with 3 separate *Current Procedural Terminology®*, fourth rev, (*CPT-4*) codes: 1 for the MPI itself, a second "add-on" code for left ventricular (LV) wall motion, and a third add-on code for LV ejection fraction. This led to relatively high reimbursement for these studies. However, beginning in 2010, the codes were bundled together. The 2 add-on codes were eliminated. New primary MPI codes were established, at lower reimbursement levels, and those new codes included the determination of LV wall motion and ejection fraction. The result was a 36% decrease in reimbursement for the typical MPI examination. This followed the Deficit Reduction Act of 2005, which had taken effect in January 2007 and, among other things, reduced Medicare technical component reimbursement for private office MPI by 16%.

Our purpose in this study was to see if these changes have affected the utilization of MPI among radiologists and cardiologists in both the hospital and private office settings, using updated nationwide Medicare data through 2010.

METHODS

We used the Medicare Part B Physician/Supplier Procedure Summary Master Files for 2000 to 2010 as our data source. These files contain information on all Medicare fee-for-service patients (35.3 million in 2010) but do not include those enrolled in Medicare Advantage plans (11.9 million in 2010). For each code in the *CPT-4* manual, they provide nationwide data on procedure volume, specialties of the physicians filing the claims, places of service where the procedures were performed, and other administrative information. Physician specialties are determined using the 108 Medicare specialty codes. For this study, we specifically identified radiologists and cardiologists and then included all those in other specialties and primary care in the category of "other physicians." The category of radiologists included those using the specialty codes for diagnostic radiology, interventional radiology, and nuclear medicine. The place-of-service codes were used to distinguish procedures performed in private offices from those performed in hospital settings. The latter included aggregated procedures performed under the place-of-service codes for hospital inpatients, hospital outpatient facilities, and emergency departments. The number of fee-for-service beneficiaries each year was determined from other Medicare files, and we then were able to calculate utilization rates per 1,000 beneficiaries.

In this study, we evaluated trends in primary MPI codes and did not include the add-on codes for LV wall motion or ejection fraction. All MPI studies using planar, single-photon emission computed tomography (SPECT), or PET scanners were included. The *CPT-4* codes that were tabulated are shown in Table 1. As noted earlier, before 2010, there were 4 codes used for primary SPECT or planar MPI studies. In most instances, when 1 of these codes was used to file claims, 1 or both add-on codes were used in conjunction. As shown in the table, starting in 2010, 4 new codes replaced the older ones, and these 4 new codes incorporated the 2 add-on codes that were thereupon eliminated. The 2 PET MPI codes did not change in 2010.

Table 1. *Current Procedural Terminology*, fourth rev, codes used for radionuclide MPI, reflecting the 2010 code changes

Descriptor	2009 and Before	2010 and Thereafter
MPI, planar, single study	78460	78453
MPI, planar, multiple studies	78461	78454
MPI, SPECT, single study	78464	78451
MPI, SPECT, multiple studies	78465	78452
Add-on code for LV wall motion	78478	Deleted
Add-on code for LV ejection fraction	78480	Deleted
MPI, PET, single study	78491	78491
MPI, PET, multiple studies	78492	78492

Note: LV = left ventricular; MPI = myocardial perfusion imaging; SPECT = single-photon emission computed tomography. When the new codes were instituted in 2010, the two add-on codes were eliminated, and determination of both LV wall motion and ejection fraction were bundled into the primary MPI codes. The PET codes did not change. The term *multiple studies* refers to the performance of both rest and stress (either exercise or pharmacologic) imaging.

To determine procedure volume and utilization rates, we tabulated global and professional component claims but did not include technical component-only claims, because that would have led to double counting. Utilization rate trend lines were plotted for the entire study period. Data analysis was performed using SAS version 9.2 for Windows (SAS Institute Inc, Cary, North Carolina).

RESULTS

The trend in total Medicare primary MPI examinations (including all specialties and all places of service) is shown in Fig. 1. During the early years, there was a steady rapid rise in the MPI utilization rate per 1,000 beneficiaries, from 56.9 in 2000 to 83.5 in 2004. The trend line began to flatten in 2005. The utilization rate reached its peak of 88.0 in 2006 (+55% since 2000), remained relatively stable for the next 2 years, then declined in both 2009 and 2010. By 2010, the rate had dropped to 76.9 (−13% vs the 2006 peak).

Fig. 2 shows the trends in Medicare private office MPI utilization rates among cardiologists, radiologists, and other physicians. Cardiologists' private office utilization rate per 1,000 beneficiaries was 20.6 in 2000, then rose very rapidly in the ensuing years. But by 2007, growth had stopped. Their office rate peaked in 2008 at 50.6 (+146% since 2000), during what was essentially a 3-year plateau (2006-

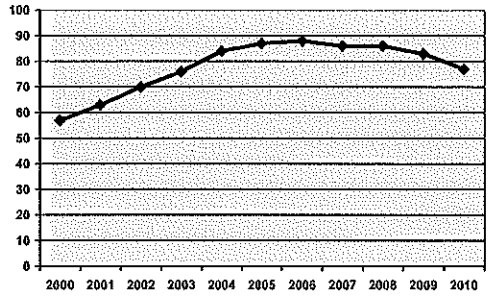

Fig. 1. Total Medicare utilization rate of radionuclide myocardial perfusion imaging in all places of service among all providers. Vertical axis shows procedure rates per 1,000 beneficiaries in the fee-for-service Medicare population.

2008). A small decline was then seen in 2009, followed by a more rapid decline to 44.4 in 2010 (−12% vs 2008). Radiologists' private office involvement in MPI was far lower, with a rate peaking at 2.7 in 2005 and 2006, then progressively dropping to 1.8 in 2010 (−33% vs 2006).

The trends in hospital settings were considerably different, as shown in Fig. 3. In 2000, radiologists were doing almost twice as many hospital-based MPI examinations as cardiologists. From that year through 2004, radiologists' utilization rate remained stable between 18.2 and 18.6. From 2005 onward, a steady decline in their rate occurred, dropping to 12.0 in 2010 (−35% since 2004). Cardiologists' rate was 9.6 in 2000, then rose slowly over the next 5 years, reaching 12.9 in 2005 (+34% vs 2000). During the next 3 years, it declined slightly to 12.3. But in 2009, it rose to 12.6 and then took a substantial jump in 2010 to 13.7 (+9% in 1 year). In 2010, cardiologists' hospital-based utilization exceeded that of radiologists for the first time.

Because PET MPI is a relatively new technology that is promising but expensive, we show its utilization trends in Fig. 4. The utilization of PET MPI is very small relative to more traditional MPI utilization (in 2010, PET MPI accounted for 2.5% of all MPI); hence, the figure depicts actual volume rather than rate per 1,000 beneficiaries. Medicare claims data were available for PET MPI for the first time in 2005. There were 9,563 of these studies performed that year, and volume grew rapidly in the ensuing years. There was an especially large increase in 2010, during which 67,902 PET MPI studies were done in this population. Almost all growth was attributable to cardiologists, who perform the vast majority of the examinations. In 2010, cardiologists' share was 79%, radiologists' share was 12%, and the remainder was attributable to other physicians.

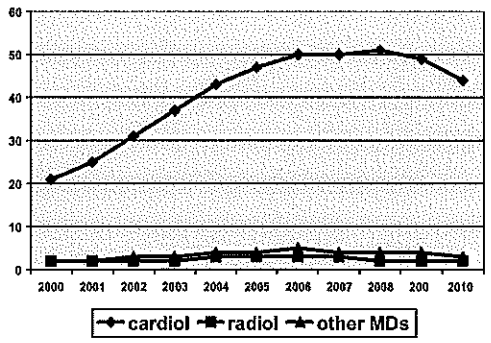

Fig. 2. Medicare utilization rates of radionuclide myocardial perfusion imaging in private offices among radiologists (radiol), cardiologists (cardiol), and all other physicians (other MDs). Vertical axis shows procedure rates per 1,000 beneficiaries in the fee-for-service Medicare population. These rates do not include relatively small numbers of studies carried out by independent diagnostic testing facilities or multispecialty groups, in which the specialty of the actual provider cannot be determined.

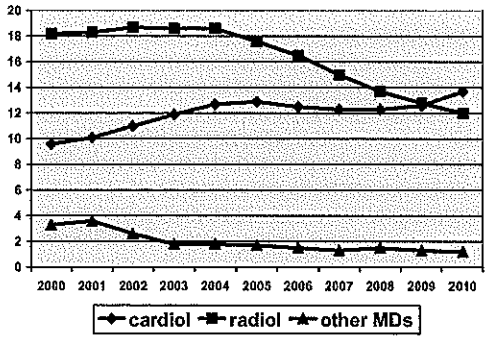

Fig. 3. Medicare utilization rates for radionuclide myocardial perfusion imaging in hospital settings among radiologists (radiol), cardiologists (cardiol), and all other physicians (other MDs). Hospital settings include studies on inpatients, emergency department patients, and those done on outpatients in hospital facilities. Vertical axis shows procedure utilization rates per 1,000 beneficiaries in the Medicare fee-for-service population.

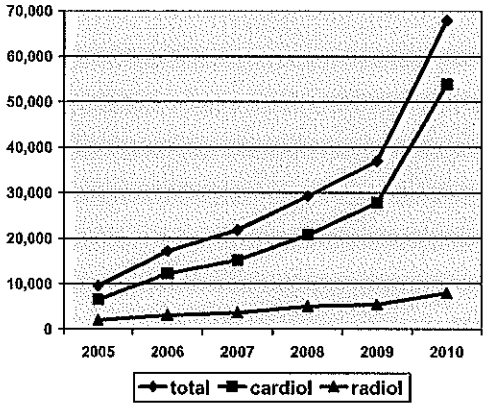

Fig. 4. PET myocardial perfusion imaging (MPI) use. Vertical axis shows total PET MPI volume, as well as volume among cardiologists (cardiol) and radiologists (radiol) from 2005 to 2010. Because the PET MPI utilization rates are so small relative to more traditional MPI, this figure shows volume instead of rates. PET MPI was reimbursable by Medicare for the first time in 2005.

DISCUSSION

The data demonstrate some trends that, although perhaps not surprising, are likely to be of some concern among radiologists. The utilization rates of MPI in the Medicare population grew rapidly in the early years of the past decade. The growth trend began to flatten in 2005, then essentially plateaued over the next 3 years. In 2009 and 2010, a downturn occurred. The primary driver of the early growth was the use of MPI in cardiology private offices, and the subsequent downturn was pronounced in the cardiology office setting as well. Radiologists' participation in private office MPI was minimal compared with that of cardiologists.

In contrast, radiologists initially had a substantial role in hospital-based MPI. In 2000, they did almost twice as many MPI scans in hospitals as cardiologists. Thereafter, radiologists' utilization rate in hospitals remained steady through 2004. However, a decline began in 2005, and that decline continued every year through 2010, the last year of the study. By 2010, radiologists' rate in hospitals had dropped by 35%. Meanwhile, cardiologists' utilization rate in hospitals rose slowly, then leveled off from 2004 through 2008. In 2009 and 2010, their rate began to rise, and by the latter year, they were for the first time doing more hospital-based MPI scans than radiologists. It seems that the decrease in cardiologists' office utilization coincided with an upswing in their utilization in hospitals. As noted earlier, the most likely explanation for this shift was the migration of cardiology practices from offices to hospital employment [6-8], and the most likely cause of this was the sharp drop in reimbursements for noninvasive cardiac imaging. The cause of the steady erosion in radiologists' role in hospital-based MPI since 2004 is less clear but was probably due at least in part to competition from private cardiology offices.

From the perspective of the health care system as a whole, the shift of advanced cardiac imaging studies from offices to hospitals is an unfavorable development. That is because reimbursements for hospital-based advanced imaging are considerably higher than those paid to private offices.

PET MPI trends are also interesting. As of yet, it represents a small proportion of overall MPI use. However, the use of this technique is growing rapidly and is strongly dominated by cardiologists. Because of its high cost, it will be important to carefully apply appropriateness criteria to limit its use to those patients who are not suitable for the less expensive SPECT.

These recent trends indicate that radiologists have their work cut out for them if they are to continue to have a substantial role in this important aspect of noninvasive cardiac imaging. During the early years of this study, they had a strong role in hospital-based MPI, even though they had little involvement in its use in offices. But their hospital MPI role has diminished considerably in recent years, while that of cardiologists seems to be increasing. The continuation of radiologists' participation in hospital-based MPI will require their close attention to quality, service, maintenance of expertise, involvement in research, and in some instances collaboration with cardiologists.

TAKE-HOME POINTS

- The overall Medicare utilization of MPI has begun to decrease.
- Private office utilization of MPI by cardiologists was a primary driver of early growth, but this decreased noticeably in 2009 and 2010.
- At the same time, cardiologists' MPI utilization in hospitals began to rise noticeably.
- This shift seems to be due primarily to the recent acquisition of cardiology office practices by hospitals, spurred by coding and reimbursement changes.
- Radiologists' role in hospital-based MPI has declined considerably in recent years and seems to be in some jeopardy.

REFERENCES

1. Hendel RC, Cerqueira M, Douglas PS, et al. A multicenter assessment of the use of single-photon emission computed tomography myocardial perfusion imaging with appropriateness criteria. J Am Coll Cardiol 2010;55:156-62.
2. Gibbons RJ, Miller TD, Hodge D, et al. Application of appropriateness criteria to stress single-photon emission computed tomography sestamibi studies and stress echocardiograms in an academic medical center. J Am Coll Cardiol 2008;51:1283-9.
3. Qaseem A, Alguire P, Dallas P, et al. Appropriate use of screening and diagnostic tests to foster high-value, cost-conscious care. Ann Intern Med 2012;156:147-9.
4. Levin DC, Intenzo CM, Rao VM, Frangos AJ, Parker L, Sunshine JH. Comparison of recent utilization trends in radionuclide myocardial perfusion imaging among radiologists and cardiologists. J Am Coll Radiol 2005;2:821-4.
5. Levin DC, Rao VM, Parker L, Frangos AJ, Intenzo CM. Recent payment and utilization trends in radionuclide myocardial perfusion imaging: comparison between self-referral and referral to radiologists. J Am Coll Rad 2009;6:437-41.
6. Harris G. More doctors giving up private practices. The New York Times. March 25, 2010.
7. Kavilanz P. Doctors going broke. CNN Money. Available at: http://money.cnn.com/2012/01/05/smallbusiness/doctors_broke/index.htm. Accessed June 13, 2012.
8. Burling S. Why heart doctors are leaving practice to work for hospitals. Philadelphia Inquirer. January 27, 2012.

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BUSINESS AND ADVOCACY

The Use of a Learning Community and Online Evaluation of Utilization for SPECT Myocardial Perfusion Imaging

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Resource-sensitive and quality-centered imaging begins with the selection of the appropriate patient and test. Appropriate use criteria have been developed to aid clinicians but are often not available in an easily accessible format. FOCUS (Formation of Optimal Cardiovascular Utilization Strategies), a Web-based community and quality improvement instrument, was developed to increase the feasibility of measuring and improving practice patterns based on the appropriate use criteria. The FOCUS instrument proposed to reduce inappropriate imaging by 15% in 1 year and by 50% within 3 years. Between April 2010 and December 2011, data were voluntarily collected through the FOCUS radionuclide imaging performance improvement module (PIM). Appropriateness rates were compared between phases of the PIM. For the 55 participating sites that had completed the PIM by December 2011, the proportion of inappropriate cases decreased from 10% to 5% ($p < 0.0001$). These preliminary data from initial participating sites suggest that through the use of a self-directed, quality improvement software and an interactive community, physicians may be able to significantly decrease the proportion of tests not meeting appropriate use criteria.

Cardiovascular imaging provides a key component of clinical care for 10 million patients a year (1). There is unquestioned value for medical imaging, with abundant literature support for a variety of modalities and clinical indications. However, as the technology adoption curve of advanced cardiac imaging went through its natural cycle, cardiac imaging growth rates exceeded other medical services. When combined with unexplained geographic variation, questions regarding appropriate use and overall quality of care were raised. Yet, since 2005, discretionary use of advanced diagnostic imaging in Medicare patients has largely stabilized and displayed a marked deceleration in growth. In 2009, the volume of advanced imaging services delivered to Medicare recipients actually decreased for the first time in 11 years. A variety of measures implemented to curb these costs may have contributed to shifting this growth curve. These have included the leveling off of technology adoption curves, the Deficit Reduction Act of 2005, the development of appropriate use criteria (AUC), reimbursement restrictions, and radiology benefit management (RBM) programs (2). Although payment cuts and third-party review reimbursement strategies may reduce costs, they may not all lead to optimal use of resources in which the appropriate test occurs in the appropriate patient.

From the *American College of Cardiology, Cardiology Division, Washington Hospital Center, Washington, DC; †Medstar Health Research Institute, Washington, DC; and the ‡Cardiovascular Division, University of Miami Miller School of Medicine, Miami, Florida. Mr. Allen is an employee of the American College of Cardiology Foundation. Ms. Saifi was a former employee of the American College of Cardiology Foundation at the time the study was conducted. The other authors have reported they have no relationships relevant to the contents of this paper to disclose.

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Resource sensitive and quality-centered imaging begins with the selection of the appropriate patient and test according to objective, clinically based criteria. Through the development and application of AUC, a potential partnership has been forged among clinicians, educators, and payers for rational and fair cardiovascular imaging practices. The goals of the AUC initiative include helping educate clinicians on their practice habits, emphasizing the clinical indications and risk factors that drive testing, and improving the cost effectiveness of cardiovascular imaging.

The FOCUS (Formation of Optimal Cardiovascular Utilization Strategies) program of the American College of Cardiology (ACC) aims to implement the criteria, while simultaneously providing information regarding practice performance to the clinician. The AUC form the basis for the program in which the quality improvement material and practice feedback are provided to physicians. FOCUS is as a Web-based community and quality improvement project with the stated intention of reducing inappropriate imaging by 15% in 1 year and by 50% within 3 years. FOCUS provides a structured format for physicians to document their cases and track the appropriateness of their utilization. The purpose of the FOCUS tool was to aid physicians in improving the appropriate use of radionuclide imaging (RNI) and reduce the number of studies designated as "inappropriate." This study examines cardiac imaging use among participating physicians and whether the proportion of studies designated as inappropriate improve, decrease, or stay the same over the course of their participation in the performance improvement module (PIM) for RNI, the first modality within the program.

The American College of Cardiology Foundation (ACCF) partnered with a technology vendor to create the FOCUS RNI PIM. This tool was created in response to questions about appropriate use to help physicians track their own practice patterns and implement positive changes. Availability of the FOCUS program was made known through various listservs, print, and Internet sources. The program was launched officially in January 2010 through a webcast; however, data collection did not begin until April 2010 after a second webinar. The FOCUS webinars contained information on the history and background of the AUC and FOCUS program, as well as more specific information about how to implement and use FOCUS in one's practice. Participation in the FOCUS listserv is a required component of the PIM. As participants gain a greater familiarity with the criteria and form their own action plans, the listserv can be used by a physician to e-mail a question or comment and receive responses from fellow participants and peers. The FOCUS community Web page was launched to provide another medium for questions, comments, and experiences to be shared and documented for a longer term. The page allows participants a space in which to create discussion groups and post questions and answers that can be viewed by future FOCUS participants. Both of these platforms encourage participant interaction and allow for exchange of ideas and the development of best practices.

Data collection began in April 2010 and continued through December 2011. The PIM consisted of 3 stages. In the first stage, participants entered consecutive patient cases (prospective or retrospective) to establish a baseline sample. Appropriate use was measured based on the 2009 RNI Appropriate Use Criteria using a computer based algorithm (Fig. 1). A few short questions based on the main reason for the patient visit were required. These categories were preoperative assessment, active or current ACS, evaluation after percutaneous coronary intervention or coronary artery bypass graft surgery, follow-up after prior testing, evaluation of ischemic equivalent, and evaluation of an asymptomatic patient. No protected health information or patient identifiers were required. Participants used the FOCUS PIM for a variety of different reasons (Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories laboratory accreditation, physician level maintenance of certification part IV, and general quality improvement); therefore, it was not possible to monitor whether each registered "participant" was entering data for 1 physician or for multiple physicians. However, each user was required to register for the PIM with a unique e-mail address and Cardiosource account. Therefore, we will refer to each registered user as 1 site or participant. Participants sorted patients into 1 of 6 categories on the basis of their reason for visit and then responded to a few short questions necessary to determine the appropriateness of the case (Fig. 2). A minimum of 10 consecutive patient cases were required before participants could move to the next stage. However, participants were encouraged to enter at least 30 cases and the Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories required at least 5% of their cases be reviewed. Stage 2 featured the development of an action plan and incorporated quality improvement activities to support appropriate use of imaging. Participants were asked to list 3 goals they had in regard to improving their appropriateness rate, and 3 actions that they would implement to achieve these goals. Participants were also asked to view a FOCUS webinar, contribute at least twice to the FOCUS listserv and join the online FOCUS Innovation Community. At least 30 days after they had created and begun to implement their action plan, participants entered additional consecutive patient cases and reviewed appropriateness rates for a second time to gauge their progress. Participants then continued to implement their action plan for at least 30 to 60 days, after which they once again entered consecutive patient cases in stage 3 to re-evaluate their performance and see the final impact of their changes.

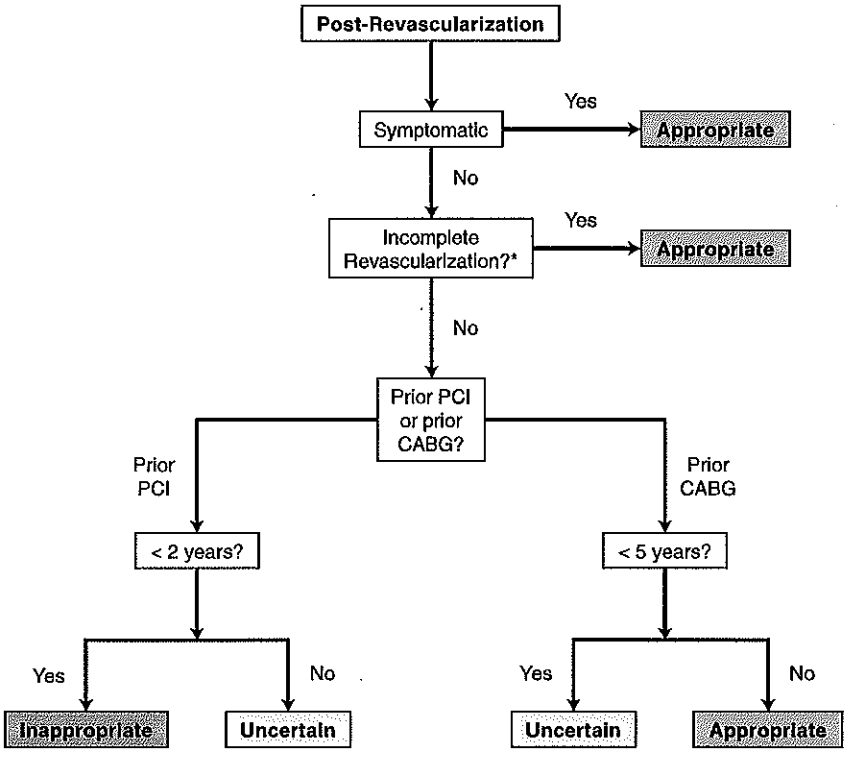

Figure 1. Post-Revascularization Decision Tree

An algorithm from the American College of Cardiology radionuclide imaging appropriate use criteria. The FOCUS (Formation of Optimal Cardiovascular Utilization Strategies) tool uses similar algorithms to sort cases into the appropriate, inappropriate, and uncertain categories. *Assumes that additional revascularization is feasible. CABG = coronary artery bypass graft surgery; PCI = percutaneous coronary intervention.

After the completion of each phase, participants were asked to complete a short evaluation survey about their participation in the PIM. They were also presented with a report detailing their AUC rates. The AUC rates were shown for cases considered to be appropriate, inappropriate, uncertain, and not covered. Additionally, the inappropriate rates were further broken down by common inappropriate clinical scenarios as well as comparisons of their individual rates to those within their practice and/or specialty. Upon completion of the PIM, participants were presented with a report comparing their AUC rates through the different stages of the PIM.

Demographic information on the participants and the proportion of imaging tests within categories of appropriate, uncertain, and inappropriate are reported. A chi-square test was used to evaluate the proportion of cases within appropriateness categories. A chi-square test was also used to test the significance between baseline rates of participants. Participant level data was measured by determining if an individual practice's rates showed a significant increase or decrease. Qualitative data from participant action plans was also analyzed to establish best practices. These were analyzed by creating several broad categories based on the data and sorting each answer item into the appropriate category. Physician responses to the evaluation questions after each phase of the PIM were also analyzed to better understand how physicians felt about the format, clinical relevance, and benefit of the PIM.

A total of 521 sites registered for FOCUS as of December 2011: 362 participating sites were working on stage 1, 104 on stage 2, and 55 on stage 3. Because the PIM is self-directed, participants progress through the stages at their own pace, spending differing amounts of time collecting data in each stage. Sites are located in 49 states and consist of a variety of practice sizes (Fig. 3). The baseline utilization rates for the 221 participants who had completed stage 1 found 80% of studies were appropriate, 9% uncertain, and 11% inappropriate ($n = 11,845$). For the 55 participating sites that had completed the PIM, the proportion of inappropriate cases decreased from 10% to 5% ($p < 0.0001$) between stages 1 and 3. A concomitant increase in appropriate cases was noted, from 82% to 89% (Fig. 4).

The baseline (stage 1) rates between participants who had completed the PIM were compared with those who had not completed the PIM. Participants who had completed the PIM had slightly better appropriateness rates (82% appropriate, 9% uncertain, 10% inappropriate) than those who had not yet completed (80% appropriate, 9% uncertain, 11% inappropriate; $p = 0.025$).

A participant level analysis was also conducted on sites that had completed the PIM. Between stages 1 and 3, 87% of sites had improved or unchanged (62% improved, 25% unchanged) appropriateness rates. Of those whose rates remained unchanged, 86% had started and ended with a 0% inappropriate rate. Thirteen percent (7 of 55) of the sites experienced an increase in their rate of inappropriate testing. For these 7 sites, the increases ranged from 2 to 24 percentage points.

Table 1 outlines the most common specific inappropriate indications: low risk asymptomatic, low risk symptomatic, perioperative, post–percutaneous coronary intervention within 2 years, and other. The "other" category consisted of inappropriate indications that did not fall into the above groups. Although the actual numbers in each category declined, the proportions in

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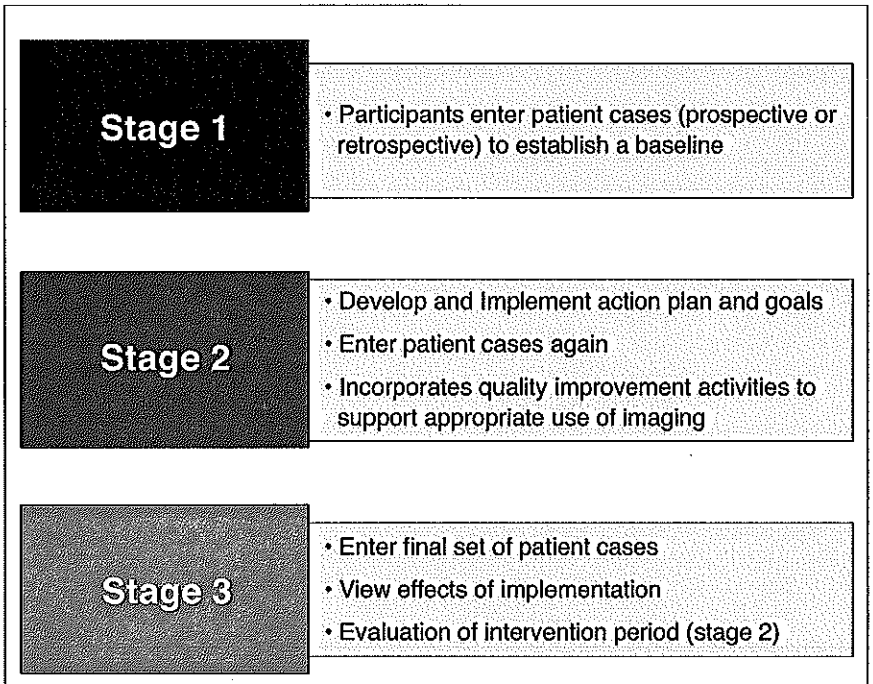

Figure 2. FOCUS RNI PIM Overview

The 3 stages of the performance improvement module (PIM) and the tasks that participants accomplish in each. FOCUS = Formation of Optimal Cardiovascular Utilization Strategies; RNI = radionuclide imaging.

some of the categories changed. The greatest differences were the decrease in the "other" category and the increase in the "symptomatic" category.

Many common themes and ideas for improvement emerged from the physician responses in the action plan and implementation phase. The FOCUS participants shared a wide array of educational approaches and quality techniques that they used to impact change in their practices. The majority of participant's goals were to decrease inappropriate use (71%), increase education and awareness about AUC (37%), and to identify current ordering patterns (29%). Physicians also wanted to improve communication with primary care physicians and simplify referrals (22%). Most participants hoped to accomplish these goals through actions such as increasing the use of AUC (36%), providing physicians with regular feedback regarding their practice patterns (33%), and discussing these data at staff meetings (30%). Physicians also wanted to inform referring physicians (28%) and make better use of tools such (i.e., order sheets) to help collect more detailed patient histories (26%) (Table 2).

Participants were asked to complete an evaluation survey at several points during PIM completion. After the second stage of the PIM, many participants (48%) thought that they had been very successful in implementing their action plan; an additional 49% thought they had been somewhat successful; 93% of participants thought that they had been successful in impacting change in the appropriate use of RNI; and 66% thought they had learned something new during the implementation of their action plan.

The results of this study provide a preliminary proof of concept for potential ways to reduce inappropriate use of cardiac imaging. By decreasing the rate of inappropriate tests from 10% to 5% in 1 year among a self-selected and motivated sample of physician practices conducting RNI, the FOCUS program has begun to make progress toward its objectives. This change arose within the multifaceted approach of FOCUS that combines an immediate feedback tool, required review of data, interaction with peers, and education of physicians.

Some previous studies attempting to improve imaging appropriateness have had limited success. These have shown that feedback and education alone are not sufficient to impact physician ordering patterns. More recent studies of AUC implementation have shown improvement only with a combination of decision support and physician activation in quality improvement (3). These studies also showed similar residual rates of inappropriate use after

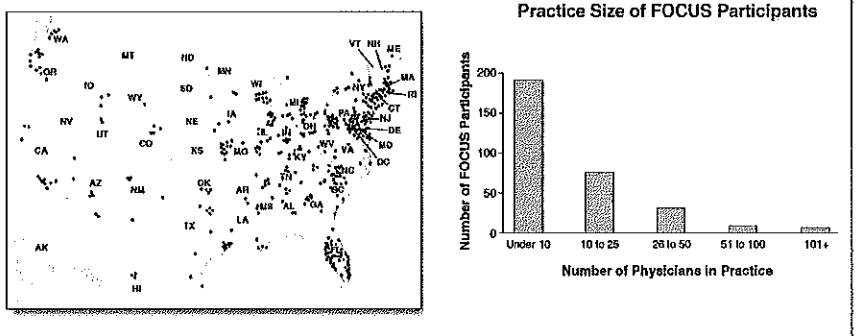

Figure 3. FOCUS Participant Demographics

Participating sites represent areas from 48 states across the nation. A variety of practice sizes are also represented. FOCUS = Formation of Optimal Cardiovascular Utilization Strategies.

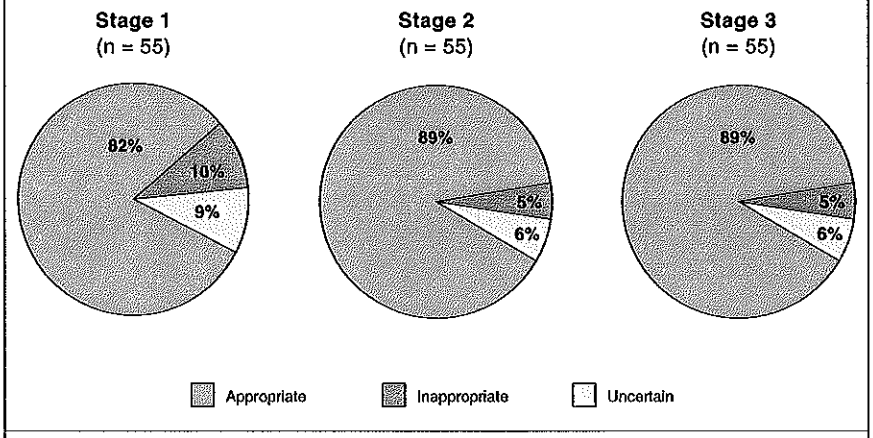

Figure 4. Change in Appropriateness Rates Across Stages

The change in the appropriateness rates is shown across the stages of the performance improvement module. **Green areas** indicate appropriate; **pink** indicates inappropriate; **yellow** represents uncertain. Only participants who had completed the performance improvement module were used in this analysis. The inappropriate rate decreased by 50% between stages 1 and 3.

improvement of <10%. The FOCUS unique performance improvement module combines data review and education with physician interaction. Physicians are required to share questions and experiences with the FOCUS listserv or on the FOCUS Web community page. This provides physicians with a platform to exchange best practices and share tips and ideas that have led to success. In addition, we also found that these avenues of communication were often heavily utilized by nurses, technicians, and other medical staff. These staff members were then able to take what they had learned and disperse it among their individual practices. The FOCUS tool also allows participants to receive feedback on the data they entered. Similarly, as they progress through the PIM participants receive feedback on prospective tests and can actually see their progress and improvement. All of these methods allow participants to first identify areas in which they need improvement, and then to develop and implement a plan to specifically target these issues. The FOCUS program provides participants with the correct educational and technological tools needed for successful self-directed quality improvement.

The relative increase in the proportion of inappropriate RNI in the low risk symptomatic group may reflect the greater challenge in changing physician ordering for this patient subset than other categories of inappropriate use.

Table 1. Rates of Individual Inappropriate Indications

	Stage 1 (n = 206)	Stage 3 (n = 70)	Percent Change
Other	25 (52)	14 (10)	−44
Low risk asymptomatic	1 (3)	0 (0)	−100
Low risk symptomatic	35 (72)	49 (34)	+40
Perioperative	31 (64)	30 (21)	−3
Post-PCI within 2 yrs	7 (14)	7 (5)	0

Values are % (n). Although the actual numbers in each category declined, the proportions in some of the categories changed. The greatest differences were the decrease in the "other" category and the increase in the "symptomatic" category.
PCI = percutaneous coronary intervention.

These patients are generally women under 60 years of age with atypical symptoms. Many providers perceive additional risk in these patients even if the actual models do not support it, and have cognitive dissonance about not ordering a test in light of public health efforts to address perceptions about women and heart disease. Further education and understanding is required to overcome these risk perceptions compared to other inappropriate indications.

There was no observed decrease between the average rate of the participants between stage 2 and stage 3. Therefore, most of the observed decrease in inappropriate ordering occurred in stage 2 after participants had written their action plan. Because the sites that improved decreased their inappropriate cases by a significant amount during stage 2, inappropriate rates were already <8% going into stage 3. It is expected that no site would have a 0% inappropriate rate as the clinical scenarios cannot account for every possible patient scenario. As such, further decrease in stage 3 was viewed as unlikely as the majority of the remaining inappropriate cases were likely patients who were exceptions. Additional improvement could have even been viewed as not allowing sufficient clinical judgment and overly strict adherence without consideration of specific patient clinical circumstances.

With the progress and the lessons learned from the PIM, the ACC has begun to expand the FOCUS program to include decision support software, through both an online portal and integrated with electronic health records. This extension will provide the AUC in an easily accessible format at the point of care and allow tracking practice patterns on an ongoing basis rather than a limited sample of cases in the current PIM. This program could be used by health plans in lieu of RBMs and would allow for more general adoption and testing of the FOCUS program and greater use and dissemination of the AUC.

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Table 2. Participant Action Planning Responses

	Goals—Educational Approaches	
1	Increase appropriate testing rates	71%
2	Increase education and awareness	37%
3	Document and determine current ordering patterns and identify areas to improve	29%
4	Acquire greater knowledge and implementation of guidelines and AUC	23%
5	Educate and simplify referrals	22%
6	Learn about FOCUS initiative	9%
7	Comply with ICANL	8%
8	Review data and compare with other measures, namely, outcomes	8%
9	Reduce RBM rejections and achieve better reimbursements	7%
10	Improve communication among physicians and staff	7%
11	Raise awareness about radiation safety and decrease patient exposure	4%
	Actions—Quality Techniques	
1	Increase education, awareness, and use of AUC	36%
2	Monitor, review, and report AUC rates (physician feedback)	33%
3	Physician meetings to review and discuss data	30%
4	Educate and inform referring physicians	28%
5	Use order sheets and/or AUC tools to get more comprehensive patient history	26%
6	Participate in webinars, listserv, and the FOCUS program	23%
7	Increase communication among physicians and staff	11%
8	Target improvements toward specific inappropriate indications	9%
9	Compare data with other measures (i.e., outcomes) to drive change	8%
10	Improve patient education and feedback	8%
11	Incorporate new technology into workflow	3%

These are the most common goals and actions that participants listed as part of their action plans.
AUC = appropriate use criteria; FOCUS = Formation of Optimal Cardiovascular Utilization Strategies; ICANL = Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories; RBM = radiology benefit manager.

Study limitations. Participants may have entered data as an individual or for a larger practice or group. Because of this, some "participants" may actually represent the combined data of several physicians. The FOCUS practice sites were concentrated heavily in the Northeast and in Florida; therefore, it is possible that certain geographic factors contributed to the observed decrease in inappropriate use, and more sites nationally would have to be studied before understanding the broader applicability and efficacy of the program. Of the 521 sites registered for the PIM, only 55 had completed the module (10.5%) as of December 2011. Most dropout/inactivity occurred before data collection during the initial registration phase of the PIM. These inactive practices may have been unable to obtain resources for the data collection requirements immediately and/or to obtain the data elements required to complete the PIM. Thus, the majority of inactive participants did not have appropriate use rates to bias their decision to proceed or not.

Participants were able to choose the time period for cases they entered and the quantity of cases entered; the program minimum was 10. Some participants entered hundreds of cases whereas others entered only 10 in each stage. Thus, some degree of self-selection bias could have influenced the results. However, because consecutive case entry for the time period chosen by the participant was required for all stages and because stage 2 and stage 3 were prospective, this bias should have been reduced. In addition, several participants were laboratory technicians and other staff who would not have had the clinical training to pre-judge whether a particular set of patients for a given time period were more likely to be appropriate or not. The baseline rates between participants who had completed and participants who had not completed the PIM were slightly different presenting another potential source for selection bias. Participants choosing to participate in a voluntary activity, especially early adopters, are likely to be more motivated and thus may be more likely to show improvement. However, the baseline inappropriate rate for those who had completed the PIM was lower than for those who had not. As such, these early adopters also had a more challenging task to demonstrate improvement because their appropriate use rates were better at the start.

Because this study was conducted with a "before-after" study design, various other changes in the fields of technology and health care may have contributed to the decrease in inappropriate use observed. Decreases in the use of advanced imaging studies were observed before the onset of this study. Although decreases in utilization may reflect broader adoption of appropriate use, several additional factors could also be impacting utilization such as payment rates. However, these secular trends of decreased utilization were seen before initiation of this study, and therefore, the ability of FOCUS to impact appropriate use beyond these trends should have been more limited if these broader trends were primarily due to appropriate use adoption. We were unable to track the exact duration of time participants spent on each activity within each stage; therefore, participants may have spent different amounts of time implementing their action plans before entering data in stage 2 in particular. Therefore, the duration of time between data collection in each stage could not be determined, potentially lessening the ability to judge the impact of the action

planning compared to other variables such as reporting the data alone.

This study finds that through the use of self-directed, quality improvement software and interactive community, such as the FOCUS PIM, it appears possible for physicians to decrease the proportion of their tests not meeting appropriate use. The potential for improvement has been documented by the practices who were early entrants in this study. The opportunity to improve through physician involvement in a community, sharing data among peers, and engaging in quality improvement appears substantial. Further study of the remaining participants and similar efforts outside of the FOCUS PIM will be needed to understand whether other sites can achieve gains similar to those accomplished by these early adopters.

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REFERENCES

1. Shaw LJ, Min JK, Hachamovitch R, et al. Cardiovascular imaging research at the crossroads. J Am Coll Cardiol Img 2010;3:316–24.
2. Levin DC, Rao VM, Parker L, Frangoes AJ, Sunshine JH. Bending the curve: the recent marked slowdown in growth of noninvasive diagnostic imaging. Am J Radiol 2011;106:W25–9.
3. Chinnaiyan KM, Peyser P, Goraya T, et al. Impact of a continuous quality improvement initiative on appropriate use of coronary computed tomography angiography: results from a multicenter, statewide registry, the advanced cardiovascular imaging consortium. J Am Coll Cardiol 2012;60:1185–91.

Key Words: appropriate use criteria ■ FOCUS ■ imaging ■ quality improvement ■ utilization.

Exhibit 2

Patient Volume by Site, FY 2011, FY 2012, FY 2013 and FY 2014

Patient Volume by Town
Nuclear Cardiology Blue Back Square

	FY 2011
Avon	1
Barkhamsted	1
Berlin	1
Bloomfield	6
Bristol	6
Broad Brook	1
Burlington	1
Canton	2
Colchester	1
Collinsville	1
Cromwell	2
East Granby	1
East Hampton	1
East Hartford	5
Enfield	6
Essex	1
Farmington	8
Glastonbury	2
Haddam	1
Hartford	40
Hebron	1
Kensington	1
Manchester	4
Mansfield Center	1
Middletown	1
New Britain	5
Newington	16
Norfolk	2
North Granby	2
North Windham	1
Old Lyme	2
Plainville	1
Portland	2
Preston	1
Rockfall	1
Rocky Hill	5
S Glastonbury	1
Simsbury	8
South Windsor	1
Southington	3
STORRS MANS	1
Torrington	2
VERNON ROCK	2
W HARTFORD	1
West Granby	1
West Hartford	50
Wethersfield	14
Windsor	5
Windsor Locks	1
Woodbury	1
	225

	FY 2012
Avon	3
Bantam	1
Berlin	2
Bloomfield	7
BRANFORD	1
Bristol	5
Broad Brook	1
Canton	3
Coventry	2
Cromwell	4
Danielson	1
East Granby	1
East Hampton	1
East Hartford	15
Enfield	5
Farmington	2
Glastonbury	6
Granby	3
Hartford	42
Manchester	5
Marlborough	2
Meriden	1
Middletown	2
NANTUCKET	1
Narragansett	1
New Britain	8
Newington	15
Norfolk	2
North Windham	1
Norwich	1
Plainville	2
Portland	1
Preston	1
Rocky Hill	6
S Glastonbury	1
Simsbury	4
South Windsor	2
Southington	3
Terryville	1
Tolland	2
Torrington	1
Unionville	2
Vernon	1
VERNON ROCKVILLE	1
Wallingford	1
Waterbury	1
West Hartford	36
West Simsbury	1
Wethersfield	14
Windsor	8
Windsor Locks	1
Winsted	1
	235

	FY 2013
Avon	1
Bantam	1
Bloomfield	5
Boca Raton	1
Bristol	1
Burlington	2
Cheshire	1
Colchester	1
Cromwell	2
East Granby	1
East Hartford	8
EASTHAMPTON	1
Ellington	2
Enfield	3
Farmington	8
Glastonbury	2
Granby	2
Hartford	29
Higganum	1
Manchester	1
Middletown	4
New Britain	3
Newington	10
Old Lyme	1
Plainville	1
PLEASANT VALLEY	1
Rocky Hill	1
Simsbury	4
Somers	1
South Glastonbury	1
South Windsor	5
Southington	4
Suffield	2
Tariffville	1
Tolland	1
Torrington	1
Unionville	1
VERNON ROCKVILLE	1
Waterbury	1
West Granby	1
West Hartford	16
West Simsbury	1
Wethersfield	9
Windsor	3
Windsor Locks	2
Winsted	1
	150

	FY 2014
Amston	1
Ashford	1
Avon	4
Bloomfield	4
Bristol	1
Burlington	1
Canton	2
East Canaan	1
East Granby	3
East Hartland	1
Enfield	5
Farmington	1
Glastonbury	2
Granby	2
Hartford	18
Manchester	1
Middletown	2
New Britain	1
Newington	6
Niantic	1
North Canton	1
North Granby	2
NORTH STRATFORD	1
Old Lyme	1
Plainville	2
PLEASANT VALLEY	1
Rockfall	1
Simsbury	4
Southington	1
Suffield	1
Waterford	1
West Hartford	25
West Simsbury	3
West Suffield	1
Wethersfield	5
Windsor	3
Windsor Locks	2
Winsted	1
	114

please note : Towns in "red "are not in service area

Patient Volume by Town
Nuclear Cardiology Avon

FY 2011	
Avon	12
Barkhamsted	2
Berlin	2
Bloomfield	6
Burlington	4
Canton	5
Collinsville	3
East Hartland	4
Enfield	3
Farmington	7
Glastonbury	2
Granby	8
Harwinton	5
Manchester	2
New Hartford	3
Newington	4
Plainville	2
Simsbury	6
South Windsor	2
Southington	2
Torrington	7
West Granby	2
West Hartford	11
West Simsbury	3
Wethersfield	2
Windsor	5
Winsted	8
	122

FY 2012	
Avon	21
Barkhamsted	4
Berlin	1
Bethlehem	1
Bloomfield	8
Burlington	2
Canton	3
Canton Center	1
Colebrook	1
Collinsville	2
Columbia	1
Coventry	1
East Canaan	1
East Granby	2
East Hartford	1
Ellington	2
Enfield	4
Falls Village	1
Farmington	6
Granby	4
Hartford	2
LIVINGSTON	1
Longmeadow	1
Meriden	1
New Britain	2
New Hartford	12
Newington	4
Norfolk	2
North Granby	3
Northfield	1
Pine Meadow	1
Plainville	1
Plantsville	1
PLEASANT VALLEY	2
Riverton	1
Simsbury	21
South Glastonbury	1
South Windsor	1
Southington	1
Suffield	1
Tariffville	1
Thomaston	1
Torrington	16
Unionville	1
VERNON ROCKVILLE	1
Weatogue	2
West Granby	1
West Hartford	16
West Simsbury	6
West Suffield	1
Wethersfield	3
Windsor	4
Winsted	9
	189

FY 2013	
Amston	1
Avon	17
Berlin	1
Bloomfield	9
Bristol	6
Burlington	2
Canton	6
Canton Center	1
Collinsville	2
Coventry	1
Cromwell	1
East Berlin	1
East Granby	1
East Windsor	1
Enfield	2
Falls Village	1
Farmington	7
Glastonbury	1
Granby	4
Hartford	3
Harwinton	3
Lakeville	1
Morris	1
New Hartford	8
Newington	2
Niantic	1
Norfolk	2
North Granby	1
Northfield	1
Plainville	1
Sheffield	1
Simsbury	16
Southington	3
Southwick	1
Tariffville	1
Torrington	7
Unionville	4
Wallingford	1
Waterbury	1
Weatogue	3
West Granby	1
West Hartford	18
West Simsbury	3
Windsor	2
Windsor Locks	2
Winsted	11
	164

FY 2014	
Avon	17
Barkhamsted	2
Bethlehem	1
Bloomfield	11
Bristol	3
Burlington	1
Canton	4
Collinsville	1
East Granby	1
East Hartford	1
East Hartland	5
Farmington	14
Granby	4
Hartford	2
Harwinton	2
Lakeville	2
Manchester	3
New Britain	2
New Hartford	7
Newington	1
Norfolk	3
North Granby	1
NORTH PORT	1
Norwich	1
Plantsville	1
PLEASANT VALLEY	3
Simsbury	16
Somers	1
South Glastonbury	1
South Windsor	1
Southington	2
Torrington	5
Unionville	3
Waterbury	1
Weatogue	3
West Hartford	23
West Simsbury	2
West Suffield	1
Windsor	5
Winsted	14
	172

please note : Towns in "red "are not in service area

Patient Volume by Town
Nuclear Cardiology Farmington

	FY 20122
Amston	1
Ashley Falls	1
Avon	13
BAREFOOT BAY	1
Berlin	1
Bloomfield	7
BONITA SPRINGS	1
Bristol	4
Burlington	3
Cheshire	1
Cromwell	1
East Granby	2
East Haddam	1
Enfield	2
Farmington	12
Glastonbury	2
Granby	2
Hanover	1
Hartford	24
Harwinton	3
Kensington	2
Litchfield	3
Meriden	1
Morris	1
New Britain	1
New Hartford	1
Newington	2
North Granby	1
PLEASANT VALLEY	1
Scotland	1
Simsbury	4
Southington	6
Southwick	1
Suffield	1
Torrington	15
Unionville	1
West Hartford	12
Wethersfield	3
Winsted	4
Wolcott	1
	145

	FY 2012
Andover	1
Avon	11
Bantam	1
Berlin	1
Bloomfield	3
Bristol	4
Brooklyn	1
Burlington	5
Canterbury	1
Canton	4
Cheshire	1
Collinsville	1
CORNWALL BRIDGE	1
East Granby	2
East Hartford	1
Ellington	2
Farmington	13
Fort Myers	1
Glastonbury	1
Goshen	1
Granby	1
Great Barrington	1
Hartford	3
Harwinton	3
Hebron	1
Litchfield	1
Marlborough	1
Mystic	1
New Britain	6
Newington	7
Norfolk	1
North Granby	1
Old Lyme	1
Plainville	4
Plantsville	2
PLYMOUTH	1
Portland	1
Prospect	1
Riverton	2
Rocky Hill	1
S Glastonbury	1
SANDISFIELD	1
SEBRING	1
Simsbury	5
South Lyme	1
Southbury	1
Southington	8
Suffield	1
THE VILLAGES	1
Torrington	13
Unionville	1
VERNON ROCKVILLE	1
Weatogue	2
West Granby	1
West Hartford	14
West Simsbury	1
Wethersfield	4
WILMINGTON	1
Winsted	6
	160

	FY 2013
Amston	1
Ashley Falls	1
Avon	15
Baltic	1
Barkhamsted	2
Berlin	4
Bethlehem	1
Bloomfield	12
Bristol	7
Burlington	3
Canaan	3
Canton	7
CORNWALL BRIDGE	1
Cromwell	4
Durham	1
East Berlin	1
East Canaan	1
East Granby	1
East Hampton	1
Ellington	1
Farmington	16
Glastonbury	1
Goshen	2
Granby	3
Haddam	1
Harwinton	3
Kensington	2
Litchfield	4
Longmeadow	1
Manchester	3
Middletown	4
Morris	2
Mystic	1
NAPLES	1
Naugatuck	1
New Britain	8
New Hartford	3
Newington	10
Norfolk	2
Northfield	1
Plainville	3
Plantsville	1
PLEASANT VALLEY	1
Pomfret Center	1
Riverton	1
Rocky Hill	3
Simsbury	20
SOUND BEACH	1
South Windsor	5
Southington	2
Stonington	1
Terryville	1
Torrington	17
Unionville	6
West Hartford	34
West Simsbury	5
Westbrook	1
Wethersfield	2
Willington	1
Windsor	2
Windsor Locks	1
Winsted	7
Wolcott	1
	254

	FY 2014
Avon	11
BAREFOOT BAY	1
Berlin	2
Bloomfield	7
Bristol	8
Burlington	3
Canton	2
Cheshire	2
CORNWALL BRIDGE	1
Coventry	1
Cromwell	5
Danbury	1
Dayville	1
Durham	1
East Berlin	1
East Hampton	2
East Hartford	5
East Windsor	1
Ellington	1
Enfield	5
Farmington	16
Fort Myers	1
Glastonbury	6
Goshen	4
Granby	4
Guilford	1
Hartford	9
Harwinton	4
Kensington	3
Killingworth	1
LAND O LAKES	1
Lebanon	1
Longmeadow	1
Manchester	3
Meriden	3
Middletown	4
Morris	1
New Britain	3
New Hartford	6
Newington	7
Norfolk	1
North Granby	2
Norwich	1
Plainville	5
Portland	1
Rocky Hill	10
SARASOTA	1
Shelton	1
Simsbury	7
SOMERSVILLE	1
South Glastonbury	1
Southington	10
Springfield	1
Stafford Springs	1
Sterling	1
Terryville	1
Tolland	2
Torrington	5
Unionville	2
Vernon	1
VERNON ROCKVILLE	1
Wallingford	3
Waterbury	3
Waterford	1
Weatogue	3
West Granby	1
West Hartford	9
West Suffield	2
Wethersfield	8
Willimantic	1
Windsor	4
Windsor Locks	1
Winsted	2
Wolcott	1
	235

please note : Towns in "red "are not in service area

Patient Volume by Town
Nuclear Cardiology Glastonbury

	FY 2011		FY 2012		FY 2013		FY 2014
Andover	2	Amston	2	Amston	2	Agawam	1
Avon	1	Avon	4	Andover	2	Amston	1
Berlin	2	Barkhamsted	1	Berlin	3	Andover	1
Bloomfield	3	Berlin	2	Bloomfield	2	Avon	1
Bolton	2	Bloomfield	2	Bolton	1	Berlin	2
Bristol	2	Bolton	2	Bristol	3	Bloomfield	5
Broad Brook	1	Bristol	4	Canton	1	Bolton	1
Canton	1	Broad Brook	1	Clinton	1	Broad Brook	2
Colchester	6	Burlington	1	Colchester	3	Cheshire	1
Columbia	1	Canton	1	Coventry	1	Colchester	6
Coventry	2	Colchester	5	Cromwell	5	Coventry	1
Cromwell	5	Columbia	3	East Berlin	1	East Haddam	2
East Haddam	1	Coventry	4	EAST GLASTONBURY	1	East Hampton	2
East Hampton	6	Cromwell	7	East Hampton	2	East Hartford	10
East Hartford	30	East Haddam	1	East Hartford	26	EAST LONGMEADOW	1
East Windsor	4	East Hampton	1	Ellington	1	East Windsor	2
Ellington	1	East Hartford	28	Enfield	5	Ellington	2
Enfield	4	East Hartland	1	Essex	1	Enfield	2
Farmington	4	Ellington	2	Glastonbury	28	Farmington	2
Fort Myers	1	Enfield	6	Haddam	1	Glastonbury	24
Glastonbury	37	Farmington	3	Hartford	17	Hartford	14
Granby	1	Fort Myers	1	Hebron	1	Hebron	4
Haddam	1	Glastonbury	43	Manchester	9	Higganum	1
Hartford	20	Granby	1	Mansfield Center	1	Jewett City	1
Hebron	2	Hamden	1	Marlborough	4	Lebanon	1
Higganum	2	Hartford	47	Meriden	1	Manchester	8
Jewett City	1	Lebanon	3	Middlebury	1	Marlborough	2
Kensington	1	Madison	1	Middlefield	1	Middlefield	1
Lebanon	4	Manchester	10	Middletown	5	Middletown	1
Manchester	12	Marlborough	5	New Britain	2	NANTUCKET	1
Marlborough	3	Meriden	1	Newington	7	New Britain	1
Meriden	4	Middlefield	1	Niantic	1	Newington	2
Middletown	6	Middletown	2	Norwich	1	Niantic	2
Moodus	1	Mystic	1	Portland	1	Oakdale	1
New Britain	5	New Britain	1	Rocky Hill	13	Plainville	1
Newington	18	New London	1	S Glastonbury	1	Portland	2
North Granby	1	Newington	30	Simsbury	3	Rocky Hill	7
Norwich	3	Niantic	2	Somers	3	S Glastonbury	1
Portland	5	North Granby	1	South Glastonbury	1	Simsbury	1
Preston	1	Norwich	1	South Windsor	2	Somers	1
Rocky Hill	18	Old Saybrook	1	Southington	2	South Glastonbury	2
ROSLINDALE	1	Portland	4	Stafford	1	South Windsor	5
S Glastonbury	2	Putnam	1	STORRS MANSFIELD	1	Stafford Springs	1
Scotland	1	Rocky Hill	27	Stratford	1	Tolland	1
Somers	3	S Glastonbury	2	Suffield	1	Unionville	1
South Glastonbury	6	Salem	1	VERNON ROCKVILLE	6	VERNON ROCKVILLE	2
South Windsor	6	Simsbury	1	West Hartford	10	Wallingford	1
Southington	2	South Glastonbur	5	West Suffield	1	West Hartford	2
Stafford Springs	1	South Windsor	7	Wethersfield	24	Wethersfield	8
STORRS MANSFIEL	3	Southington	1	Willington	1	Willington	1
Tariffville	1	Stafford Springs	2	Windsor	6	Windsor	6
THE VILLAGES	1	Suffield	2	Windsor Locks	2	Windsor Locks	1
Tolland	2	Tolland	2		221		153
VERNON ROCKVILL	6	Torrington	1				
Waterbury	1	Unionville	1				
West Granby	1	Vernon	1				
West Hartford	6	VERNON ROCK\	4				
Wethersfield	52	Waterford	1				
Willimantic	2	West Hartford	13				
Willington	3	West Simsbury	2				
Windsor	9	West Suffield	1				
Windsor Locks	3	Wethersfield	34				
	337	Windsor	11				
		WOODSBORO	1				
			360				

please note : Towns in "red "are not in service area

Patient Volume by Town
Nuclear Cardiology Retreat Avenue

	FY 2011		FY 2012		FY 2013		FY 2014
Amston	1	Amston	2	AMSTAN	1	Amston	1
Ashford	3	Andover	2	Amston	1	Andover	1
Avon	16	Avon	14	Ashford	3	Ashford	1
Bantam	1	Berlin	7	Avon	3	Avon	2
Berlin	8	Bloomfield	23	Berlin	3	Berlin	3
Bloomfield	25	Bolton	3	Bloomfield	6	Bloomfield	4
Boca Raton	1	Bozrah	1	Bolton	4	Bolton	3
Bolton	8	BRANFORD	1	Broad Brook	2	BOYNTON BEACH	1
Bristol	4	Bristol	6	Brooklyn	1	Bristol	2
Broad Brook	2	Broad Brook	2	Canaan	2	Brooklyn	1
Brooklyn	1	Brooklyn	1	Cheshire	1	Burlington	2
Burlington	2	Burlington	1	Colchester	7	Colchester	4
Canaan	1	Canton	1	Coventry	3	Columbia	2
Canton	3	Centerbrook	1	Cromwell	15	Coventry	2
Chaplin	1	Cheshire	1	Deep River	1	Cromwell	1
Cheshire	1	Chester	2	Durham	2	Durham	1
Clinton	1	Colchester	9	East Granby	1	East Granby	1
Colchester	6	Collinsville	1	East Hampton	6	East Haddam	1
Colebrook	1	Columbia	2	East Hartford	18	East Hampton	4
Collinsville	3	Coventry	4	East Hartland	1	East Hartford	11
Columbia	2	Cromwell	9	East Windsor	2	East Hartland	2
Coventry	6	Deep River	1	Ellington	4	East Windsor	2
Cromwell	7	Durham	1	Enfield	11	Ellington	2
Deep River	1	East Haddam	2	Farmington	4	Enfield	6
Durham	2	East Hampton	5	FORT LAUDERDALE	1	Farmington	1
EAST GLASTONBURY	1	East Hartford	23	Glastonbury	24	Glastonbury	9
East Granby	3	East Windsor	3	Goshen	1	Granby	1
East Haddam	4	EDGARTOWN	1	Granby	3	Hanover	1
East Hampton	6	Ellington	10	Hampton	2	Hartford	39
East Hartford	22	Enfield	18	Hartford	39	Hebron	1
East Windsor	1	Farmington	9	Harwinton	2	Jacksonville	1
Ellington	9	Feeding Hills	1	Hebron	3	JUPITER	1
Enfield	9	Fort Myers	1	Higganum	2	Kensington	1
Farmington	14	Glastonbury	27	Ivoryton	1	Killingworth	1
Glastonbury	37	Goshen	2	Jewett City	1	Lebanon	1
Goshen	1	Granby	6	Kensington	1	Manchester	5
Granby	4	Great Barrington	1	Longmeadow	1	Marlborough	3
GROVETOWN	1	Groton	1	Manchester	15	Meriden	4
Haddam	1	Guilford	2	Mansfield Center	2	Middletown	6
HALLANDALE BEACH	1	Haddam	1	Marlborough	2	Moodus	2
Hartford	32	Hamden	1	MARLTONBOROUGH	1	Mystic	1
Harwinton	1	Hartford	58	Meriden	6	New Britain	1
Hebron	3	Harwinton	1	Middletown	8	Newington	24
Higganum	1	Hebron	4	Moodus	2	Plainville	2
Hopkinton	1	Higganum	1	Moosup	1	Plantsville	1
Ivoryton	2	Jewett City	1	Mystic	1	Portland	4
LANDOLAKES	1	Kensington	2	New Britain	7	Preston	1
Lebanon	2	KEY COLONY BEACH	1	New Hartford	2	Quinebaug	1
Ledyard	1	Killingworth	1	New London	1	Rocky Hill	22
LENOX	1	KINGSTON	1	Newington	28	S Glastonbury	2
Litchfield	4	LAKEWOOD RANCH	1	Niantic	3	Simsbury	2
Manchester	21	Lebanon	3	Norfolk	1	Somers	1
MARION	2	Litchfield	4	North Granby	1	South Glastonbury	1
Marlborough	4	Manchester	13	NORTH KINGSTOWN	1	South Windsor	6
Meriden	8	Mansfield Center	3	Norwich	1	Southington	2
Middletown	15	Marlborough	4	Oakdale	1	STORRS MANSFIE	1
Moodus	1	Meriden	11	Old Lyme	1	Suffield	4
Mystic	1	Middlefield	1	PALM BEACH GARDEI	1	Terryville	1
NAPLES	1	Middletown	15	Plainville	2	Tolland	6
New Britain	9	MONSON	1	Plantsville	4	Torrington	3
New Hartford	4	Mystic	2	PORT ST LUCIE	1	Unionville	1
Newington	27	Naugatuck	2	Portland	5	VERNON ROCKVII	5
Niantic	1	New Britain	15	Preston	2	Waterford	1
North Haven	1	New Haven	1	QUAKER HILL	1	West Hartford	23
Old Lyme	2	New London	1	Rocky Hill	21	West Suffield	1
Plainfield	2	Newington	25	Simsbury	4	Wethersfield	22
Plainville	4	Norfolk	1	Somers	2	Windsor	5
Plantsville	2	North Haven	1	South Glastonbury	3	Windsor Locks	2
PLEASANT VALLEY	1	Norwich	8	South Lyme	1	Wolcott	6
Portland	1	Old Saybrook	3	South Windsor	10		289
Poughkeepsie	1	Plainville	4	SOUTHAMPTON	1		
Preston	1	Plantsville	4	Southington	4		
Putnam	1	Portland	1	Springfield	1		
QUAKER HILL	1	Rocky Hill	28	Stafford Springs	2		
Rocky Hill	20	S Glastonbury	3	Suffield	6		
Salisbury	1	Scotland	1	Thomaston	2		
SCARSDALE	1	Simsbury	6	Tolland	10		
Simsbury	8	Somers	4	Torrington	6		
Somers	3	South Glastonbury	2	Unionville	3		
South Lyme	1	South Lyme	2	Venice	1		
South Meriden	1	South Windsor	17	Vernon	2		
South Windsor	18	Southington	8	VERNON ROCKVILLE	4		
Southington	6	Springfield	1	Wallingford	2		
STAFFORD SPGS	2	Stafford Springs	3	Waterbury	1		
Stafford Springs	6	STORRS MANSFIELD	1	Waterford	1		
Stonington	1	Suffield	5	West Granby	1		
STORRS MANSFIELD	2	Tariffville	1	West Hartford	33		
Suffield	4	Terryville	1	West Simsbury	1		
SUN CITY CENTER	1	Tolland	9	WEST SPRINGFIELD	1		
Terryville	1	Torrington	9	West Suffield	1		
THE VILLAGE	1	Venice	1	Westbrook	4		
Thomaston	2	Vernon	1	Westerly	1		
Tolland	6	VERNON ROCKVILLE	4	Wethersfield	20		
Torrington	9	Waterbury	1	Willimantic	3		
Union	1	Waterford	2	Willington	3		
Unionville	2	West Hartford	55	Windsor	17		
Vernon	3	West Simsbury	1	Windsor Locks	6		
VERNON ROCKVILLE	5	West Suffield	3	Winsted	2		
Wallingford	4	Westbrook	2	Wolcott	2		
Waterford	1	Westfield	1		466		
Watertown	2	Wethersfield	45				
Weatogue	2	Willimantic	1				
West Cornwall	1	Willington	1				
West Granby	1	Windsor	9				
West Hartford	54	Windsor Locks	4				
West Simsbury	2	Winsted	2				
West Suffield	3	Wolcott	2				
Westbrook	2		639				
Westerly	1						
Wethersfield	38						
Willington	1						
Windham	2						
Windsor	10						
Windsor Locks	6						
Winsted	3						
Wolcott	3						
	622						

please note : Towns in "red "are not in service area

Greer, Leslie

From: Greci, Laurie
Sent: Thursday, December 11, 2014 8:19 AM
To: Greer, Leslie
Subject: FW: Nuclear Cardiology CON - Payor Mix Adjustment - Revised 2.docx
Attachments: Nuclear Cardiology CON - Payor Mix Adjustment - Revised 2.docx

Leslie,
Please add this email and the attachment to the docket for 14-31955-CON.
Thank you,
Laurie

From: Durdy, Barbara [mailto:Barbara.Durdy@hhchealth.org]
Sent: Wednesday, December 10, 2014 4:40 PM
To: Greci, Laurie
Cc: Durdy, Barbara
Subject: Nuclear Cardiology CON - Payor Mix Adjustment - Revised 2.docx

Laurie,
As requested, attached please find the revised payer mix chart. Please let me know if you need additional information.
Thank you
Barbara

	Most Recently Completed FY2013		Projected					
			FY2015		FY2016		FY2017	
	Volume	%	Volume	%	Volume	%	Volume	%
Medicare*	688	55%	688	55%	688	55%	688	55%
Medicaid*	13	1%	13	1%	13	1%	13	1%
CHAMPUS & TriCare								
Total Government	**701**	**56%**	**701**	**56%**	**701**	**56%**	**701**	**56%**
Commercial Insurers	530	42%	530	42%	530	42%	530	42%
Uninsured	24	2%	24	2%	24	2%	24	2%
Workers Compensation								
Total Non-Government	**554**	**44%**	**554**	**44%**	**554**	**44%**	**554**	**44%**
Total Payer Mix	**1255**	**100%**	**1255**	**100%**	**1255**	**100%**	**1255**	**100%**

FY 2013 Payer Mix for 5 satellite locations

Payer	Most Recently Completed FY2013		Projected					
			FY2015		FY2016		FY2017	
	Volume	%	Volume	%	Volume	%	Volume	%
Medicare*	1198	49%	510	42%	510	42%	510	42%
Medicaid*	229	9%	216	18%	216	18%	216	18%
CHAMPUS & TriCare								
Total Government	**1427**	**58%**	**726**	**60%**	**726**	**60%**	**726**	**60%**
Commercial Insurers	951	39%	421	35%	421	35%	421	35%
Uninsured	87	3%	63	5%	63	5%	63	5%
Workers Compensation								
Total Non-Government	**1039**	**42%**	**484**	**40%**	**484**	**40%**	**484**	**40%**
Total Payer Mix	**2466**	**100%**	**1210**	**100%**	**1210**	**100%**	**1210**	**100%**

FY 2013 Payer mix for all nuclear cardiology services at Harford Hospital showing the impact of discontinuing the service at five satellite locations for FY 2015, 2016 and 2017.

Note:
The total volume in the chart above includes FY2013 volume from the five satellite locations (1255), and FY 2013 outpatient utilization at Hartford Hospital (1211).

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Office of Health Care Access

December 11, 2014

VIA FACSIMILE ONLY

Barbara A. Durdy
Director, Strategic Planning
Hartford Healthcare
181 Patricia Genova Drive
Newington, CT 06111

RE: Certificate of Need Application, Docket Number 14-31955-CON
Hartford Hospital
Termination of nuclear cardiology imaging services at the following locations: 100 Simsbury Road, Avon; 100 Retreat Avenue, Hartford; 703 Hebron Avenue, Glastonbury; 65 Memorial Road, West Hartford; and 11 South Road, Farmington

Dear Ms. Durdy:

This letter is to inform you that, pursuant to Section 19a-639a (d) of the Connecticut General Statutes, the Office of Health Care Access has deemed the above-referenced application complete as of December 11, 2014.

If you have any questions regarding this matter, please feel free to contact me at (860) 418-7032.

Sincerely,

Laurie K. Greci
Associate Research Analyst

* * * COMMUNICATION RESULT REPORT (DEC. 11. 2014 2:10PM) * * *

FAX HEADER:

TRANSMITTED/STORED : DEC. 11. 2014 2:09PM

FILE MODE	OPTION	ADDRESS	RESULT	PAGE
805 MEMORY TX		98609729025	OK	2/2

REASON FOR ERROR
E-1) HANG UP OR LINE FAIL
E-2) BUSY
E-3) NO ANSWER
E-4) NO FACSIMILE CONNECTION

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
OFFICE OF HEALTH CARE ACCESS

FAX SHEET

TO: Barbara Durdy

FAX: (860) 972-9025

AGENCY: Hartford Hospital

FROM: Laurie Greci

DATE: 12/11/2014

NUMBER OF PAGES: 2
(including transmittal sheet

COMMENTS:

RE: Certificate of Need Application, Docket Number 14-31955-CON termination of nuclear cardiology imaging services at the following locations: 100 Simsbury Road, Avon; 100 Retreat Avenue, Hartford; 703 Hebron Avenue, Glastonbury; 65 Memorial Road, West Hartford; and 11 South Road, Farmington

PLEASE PHONE IF THERE ARE ANY TRANSMISSION PROBLEMS.

Phone: (860) 418-7001 Fax: (860) 418-7053
410 Capitol Ave., MS#13HCA
P.O.Box 340308Hartford, CT 06134

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Office of Health Care Access

February 25, 2015

IN THE MATTER OF:

An Application for a Certificate of Need filed Pursuant to Section 19a-638, C.G.S. by:	Notice of Final Decision Office of Health Care Access Docket Number: 14-31955-CON
Hartford Hospital	**Termination of Nuclear Cardiology Imaging Services at Five Satellite Locations**

To: Barbara A. Durdy
Director, Strategic Planning
Hartford Healthcare
181 Patricia Genova Drive
Newington, CT 06111

Dear Ms. Durdy:

This letter will serve as notice of the Final Decision of the Office of Health Care Access in the above matter, as provided by Section 19a-638, C.G.S. On February 25, 2015, the Final Decision was rendered as the finding and order of the Office of Health Care Access. A copy of the Final Decision is attached hereto for your information.

Kimberly R. Martone
Director of Operations

Enclosure
KRM:lkg

Department of Public Health
Office of Health Care Access
Certificate of Need Application

Final Decision

Applicant: **Hartford Hospital**
80 Seymour Street, Hartford

Docket Number: **14-31955-CON**

Project Title: **Termination of Outpatient Nuclear Cardiology Imaging Services at Five Locations**

Project Description: Hartford Hospital, Inc. ("Hospital") seeks authorization to terminate outpatient nuclear cardiology imaging services at the following locations: 100 Simsbury Road, Avon; 11 South Road, Farmington; 703 Hebron Avenue, Glastonbury; 100 Retreat Avenue, Hartford; and 65 Memorial Road, West Hartford with no associated capital expenditure.

Procedural History: The Hospital published notice of its intent to file the CON Application in *The Hartford Courant* on August 27, 28 and 29, 2014. On October 14, 2014, the Office of Health Care Access ("OHCA") received the Certificate of Need ("CON") application from the Hospital for the above-referenced project. OHCA deemed the application complete on December 11, 2014.

OHCA received no responses from the public concerning the Hospital's proposal and no hearing requests were received from the public pursuant to Connecticut General Statutes § 19a-639a(e). Deputy Commissioner Brancifort considered the entire record in this matter.

Findings of Fact and Conclusions of Law

To the extent the findings of fact actually represent conclusions of law, they should be so considered, and vice versa. *SAS Inst., Inc., v. S & H Computer Systems, Inc.*, 605 F.Supp. 816 (Md. Tenn. 1985).

1. Hartford Hospital is a 867-bed acute-care hospital located 80 Seymour Street, Hartford, Connecticut and a health care facility as defined by Conn. Gen. Stat. § 19a-630. Ex. A, p. 6.

2. In cooperation with three private cardiology physician practices ("physician practices"), the Hospital offers outpatient nuclear cardiology imaging ("NCI")[1] services at the following Connecticut locations:

Table 1
LOCATIONS OF OUTPATIENT NCI SERVICES

Name	Physician Practice	Address
Nuclear Cardiology Retreat Avenue	Cardiology, P.C.	100 Retreat Avenue, Ste. 811, Hartford
Nuclear Cardiology Farmington	Cardiology, P.C.	21 South Road, Farmington
Nuclear Cardiology Glastonbury	Connecticut Multispecialty Group	703 Hebron Avenue, Glastonbury
Nuclear Cardiology Blue Back Square	Connecticut Multispecialty Group	65 Memorial Road, West Hartford
Nuclear Cardiology Avon	Consulting Cardiologists, P.C.	100 Simsbury Road, Avon

Ex. A, p. 6 and Ex. C, p. 9.

3. NCI services have been provided by the Hospital at the physician practice locations since 2002. Ex. A, p. 7.

4. The Hospital proposes to terminate its NCI services at each location due to declining volumes. The Hospital proposes to reallocate its resources by transitioning its NCI services to the private cardiologists. Ex. A, p. 7.

5. There are a number of non-invasive cardiac diagnostic alternatives to NCI services that have grown in the past five years. These procedures include stress echocardiography, cardiac computed tomography angiography and stress cardiac magnetic resonance imaging. Ex. C, p. 9.

6. The Hospital will continue to provide NCI services and centralize them at the Hospital's main campus. Ex. C, p. 93.

[1] Nuclear cardiac imaging is a type of medical examination used to diagnose and assess coronary artery disease. Radioactive tracers are injected into a patient intravenously and then detected by a special camera or other imaging device. (http://www.radiologyinfo.org)

7. The demand for NCI services has declined since 2006. The decrease is attributed to the application of appropriate use criteria for diagnostic testing, greater insurance company authorization requirements and the availability of alternative testing modalities. Ex. C, p. 91.

8. Overall, the number of scans has declined 34% since 2011. The following table reports the number of scans performed by physician practice, Hospital service location and fiscal year:

Table 2
NCI SCANS* BY PHYSICIAN PRACTICE, HOSPITAL SERVICE LOCATION AND FISCAL YEAR

Physician Practice and Hospital Service Location	Fiscal Year				% Change FYs 2013-2014	% Change FYs 2011-2014
	2011	2012	2013	2014		
Cardiology, P.C.						
Nuclear Cardiology Retreat Avenue	622	643	466	289	-61%	-54%
Nuclear Cardiology Farmington	145	160	254	235	-8%	+62%
Total for Cardiology, P.C.	**767**	**803**	**720**	**524**	**-27%**	**-32%**
Connecticut Multispecialty Group						
Nuclear Cardiology Glastonbury	337	360	221	153	-44%	-55%
Nuclear Cardiology Blue Back Square	225	235	150	114	-32%	-49%
Total for Cardiology, P.C.	**562**	**595**	**371**	**267**	**-28%**	**-52%**
Consulting Cardiologists, P. C.						
Nuclear Cardiology Avon	122	189	164	168	-2%	+38%
Total for Consulting Cardiologist, P.C.	**122**	**189**	**164**	**168**	**-2%**	**+38%**
Grand Total	**1,451**	**1,587**	**1,255**	**959**	**-31%**	**-34%**

*Counts include scans on Connecticut and out-of-state residents.
Ex. C, p. 93.

9. The physician practice sites at Retreat Avenue, Glastonbury and Blue Back Square have experienced overall declines in the number of scans performed since 2011. The three sites were open 5 days a week. Ex. C, p. 92.

10. The physician practice in Avon experienced an increase in the number of NCI scans in FY 2012 and the physician practice in Farmington had an increase in FY 2013. These two physician practices have been in the process of establishing a greater practice presence and increased the number of days per week performing NCI scans in FYs 2013 and 2014. The number of scans performed at these two locations has remained essentially unchanged in FY 2014. Ex. C, p. 92.

11. The Applicant's historical NCI services for Connecticut residents are reported in Table 3 in descending order of the total number of scans. Towns where the NCI service is located and the contiguous towns (identified in the table with an asterisk) account for 59% of the total number of NCI scans performed from FY 2011 to 2014. Each listed town is within the Hospital's service area.

Table 3
HISTORICAL NUMBER OF NUCLEAR CARDIOLOGY IMAGING SCANS
BY PATIENT TOWN OF RESIDENCE
FY 2011-FY2014

Town	Total Scans	% of Total Scans*	Cumulative %*	2011	2012	2013	2014
West Hartford**	461	9%	9%	134	134	111	82
Hartford**	438	8%	17%	116	152	88	82
Wethersfield**	307	6%	23%	109	100	55	43
Glastonbury**	294	6%	29%	90	92	63	49
Newington**	245	5%	34%	67	81	57	40
East Hartford**	204	4%	38%	57	68	52	27
Simsbury**	191	4%	41%	34	54	62	41
Rocky Hill**	182	4%	45%	43	62	38	39
Farmington**	176	3%	48%	48	38	49	41
Avon**	167	3%	52%	43	53	36	35
Bloomfield**	155	3%	55%	47	43	34	31
Torrington	117	2%	57%	33	40	31	13
Manchester	115	2%	59%	39	28	28	20
Windsor**	114	2%	61%	29	32	30	23
Enfield	96	2%	63%	24	33	21	18
South Windsor	88	2%	65%	27	27	22	12
Southington	88	2%	66%	23	28	20	17
Granby	80	2%	68%	24	22	17	17
New Britain**	80	2%	70%	20	32	20	8
Middletown	75	1%	71%	22	19	21	13
Winchester	71	1%	72%	15	18	21	17
Cromwell	68	1%	74%	15	20	27	6
Bristol	66	1%	75%	16	19	17	14
Berlin	62	1%	76%	18	15	17	12
Canton**	62	1%	77%	18	17	17	10
Vernon	52	1%	78%	16	14	13	9
Colchester	48	1%	79%	13	14	11	10
New Hartford	46	1%	80%	8	12	13	13
Suffield	43	1%	81%	8	14	11	10
Meriden	42	1%	82%	14	14	7	7
Tolland	41	1%	83%	8	13	11	9
Ellington	39	1%	83%	10	16	8	5
East Hampton	37	1%	84%	13	7	9	8
Hebron	35	1%	85%	8	9	10	8
Plainville	35	1%	85%	7	11	7	10
Windsor Locks	34	1%	86%	10	5	13	6
Burlington	33	1%	87%	10	9	7	7
Marlborough	30	1%	87%	7	12	6	5
Portland	28	1%	88%	8	7	6	7
East Windsor	28	1%	88%	9	7	5	7
Coventry	28	1%	89%	8	11	5	4
Harwinton	27	1%	89%	9	4	8	6
Barkhamsted	27	1%	90%	5	11	5	6
All Other CT Towns	519	10%	100%	150	143	125	101
Total CT Towns	**5,174**	**100%**	**100%**	**1,432**	**1,560**	**1,234**	**948**

* Rounded to the nearest whole percent.

** Indicates NCI service location town or a town contiguous to one of those towns; current service location towns are in bold. Total scans performed in these towns = 3,076 (3,076/5,174= 59.4%)

Ex. C, pp. 119 – 123.

12. The Hospital has two NCI systems capable of performing 15 scans per day. The yearly capacity is 3,900 scans. The following table demonstrates the available capacity of the Hospital to accept referrals for persons that prefer to have their test at the Hospital.

Table 4
HOSPITAL'S PROJECTED CAPACITY FOR NUCLEAR CARDIOLOGY IMAGING SCANS

Number of Scans Performed at Hospital in 2014:	1,954*
Number of Scans Projected to Shift from Proposal:	671
Combined Number of Scans (2014 plus Shift):	2,625
Total Capacity:	3,900
% Available Capacity with Proposal	**33%**

* Includes inpatient and outpatient scans.
Ex. A, p. 10 and Ex. D, p. 2.

13. Saint Francis Hospital and Medical Center in Hartford and John Dempsey Hospital in Farmington provide NCI services. Ex. A, pp. 9, 10.

14. The physician practices have offices at the following locations:

Table 5
NAMES AND ADDRESSES OF PHYSICIAN PRACTICES

Practice Name	Practice Locations
Cardiology, P.C.	100 Retreat Avenue, Hartford** 21 South Road, Farmington**
Connecticut Multispecialty Group*	703 Hebron Avenue, Glastonbury** 65 Memorial Road, West Hartford** 1260 Silas Deane Highway, Wethersfield 9 Cranbrook Boulevard, Enfield 478 Burnside Avenue, East Hartford 100 Simsbury Road, Avon 11 South Road, Farmington
Consulting Cardiologists, P.C.	100 Simsbury Road, Avon** 85 Seymour Street, Hartford 305 Western Boulevard, Glastonbury 631 South Quake Lane, West Hartford 256 North Main Street, Manchester 74 Mack Street, Windsor 100 Hazard Avenue, Enfield 1025 Silas Deane Highway, Wethersfield

* Only locations that provide cardiology services are listed.
** Location currently offers NCI services.
Ex. C, p. 99.

15. Two of the physician practices will continue to provide NCI services at an existing location. A third physician practice will establish NCI services at one of its other practice locations. The following table lists the proposed locations:

Table 6
PROPOSED LOCATIONS OF PHYSICIAN PRACTICE NCI SERVICES

Practice Name	Practice Location
Cardiology, P.C.	21 South Rd., Farmington
Connecticut Multispecialty Group	1260 Silas Deane Hwy., Wethersfield
Consulting Cardiologists, P.C.	100 Simsbury Rd., Avon

Ex. C, p. 95.

16. There is no capital expenditure associated with the proposal. Ex. A, p. 16.

17. There are no projected operating losses associated with this proposal. Ex. A, p. 86.

18. The Hospital is projecting modest gains from operations with the proposal. The following table illustrates the Hospital's incremental projected gain from operations with the proposal through FY 2017:

Table 7
HOSPITAL'S FINANCIAL PROJECTIONS WITH THE PROPOSAL

Description	FY 2015	FY 2016	FY 2017
Revenue from Operations	$ (1,181,647)	$ (1,228,913)	$ (1,278,069)
Operating Expenses	(1,190,284)	(1,237,896)	(1,287,411)
Gain from Operations	**$ 8,637**	**$ 8,963**	**$ 9,342**

Ex. A, p. 86.

19. The Hospital submits charges to payers for the technical component of the NCI services. The physician practices submit charges for the professional component. Under the Hospital's proposal, the private practices will bill for the NCI services without a hospital component, also referred to as a facility fee. Ex. C, pp. 97, 98.

20. The cost of NCI services is lower in a private office than in the hospital outpatient setting when based on Medicare reimbursement. Ex. C, p. 98.

21. There will be no change in the rates charged for the NCI services, currently performed by the Hospital, as a result of the proposal. Ex. C, p. 97.

22. By eliminating the satellite NCI service sites, the Hospital can reduce its fixed costs, e.g. the cost of the space, camera maintenance and personnel salaries. Ex. C, p. 93.

23. Access to NCI services provided under the Medicaid program will not change. The patients currently served by the Hospital are the patients of the physician practices at each location. Ex. A, pp. 11, 14 and Ex. C, p. 94.

24. In FY 2013, the Hospital's five satellite locations provided 1% of its NCI services to patients with Medicaid. The Hospital's main campus provided 18% to Medicaid patients. The combined Medicaid payer was 9%. The following table reports the payer mix based on

patient volume for FY 2013, the latest year available, for the Hospital's five satellite locations as well as the outpatient scans performed at the Hospital's main campus.

Table 8
PAYER MIX BY PATIENT VOLUME FOR NCI SERVICES IN FY 2013

	5 Satellite Locations		Hospital Outpatient		Combined	
Payer	**Volume**	**%**	**Volume**	**%**	**Volume**	**%**
Medicare	688	55%	510	42%	1,198	49%
Medicaid	13	1%	216	18%	229	9%
Total Government	**701**	**56%**	**726**	**60%**	**1,427**	**58%**
Commercial	530	42%	421	35%	951	39%
Uninsured	24	2%	63	5%	87	3%
Total Non-Government	**554**	**44%**	**484**	**40%**	**1,038**	**42%**
Total Payer Mix	**1,255**	**100%**	**1,210**	**100%**	**2,465**	**100%**

Ex. D, p. 2.

25. The Hospital projects that it will continue to provide 18% of its NCI services on its main campus to patients with Medicaid. The following table also reports the projected payer mix for FYs 2015, 2016 and 2017 with proposal:

Table 9
PROJECTED PAYER MIX BY PATIENT VOLUME AND FISCAL YEAR

Payer	FY2015		FY2016		FY2017	
	Volume	**%**	**Volume**	**%**	**Volume**	**%**
Medicare	510	42%	510	42%	510	42%
Medicaid	216	18%	216	18%	216	18%
Total Government	**726**	**60%**	**726**	**60%**	**726**	**60%**
Commercial	421	35%	421	35%	421	35%
Uninsured	63	5%	63	5%	63	5%
Total Non-Government	**484**	**40%**	**484**	**40%**	**484**	**40%**
Total Payer Mix	**1,210**	**100%**	**1,210**	**100%**	**1,210**	**100%**

Ex. D, p. 2.

26. OHCA is currently in the process of establishing its policies and standards as regulations. Therefore, OHCA has not made any findings as to this proposal's relationship to any regulations not yet adopted by OHCA. (Conn. Gen. Stat. § 19a-639(a)(1))

27. This CON application is consistent with the overall goals of the Statewide Health Care Facilities and Service Plan. (Conn. Gen. Stat. § 19a-639(a)(2))

28. The Hospital has established that there is a clear public need for its proposal. (Conn. Gen. Stat. § 19a-639(a)(3))

29. The Hospital has demonstrated that the proposal is financially feasible. (Conn. Gen. Stat. § 19a-639(a)(4))

30. The Hospital has satisfactorily demonstrated that the proposal will maintain quality and access to services in the region for all relevant patient populations and that the proposal will reduce overall system costs by eliminating duplicative services and allowing for the greater use of a more cost-efficient diagnostic method. (Conn. Gen. Stat.§ 19a-639(a)(5))

31. The Hospital has shown that there would be no adverse change to the provision of health care services to the relevant populations and payer mix, including access to services by Medicaid recipients and indigent persons. (Conn. Gen. Stat. § 19a-639(a)(6))

32. The Hospital has satisfactorily identified the population to be affected by this proposal. (Conn. Gen. Stat. § 19a-639(a)(7))

33. The declining historical utilization of nuclear and non-nuclear cardiac stress testing in the service area supports this proposal. (Conn. Gen. Stat. § 19a-639(a)(8))

34. The Hospital has satisfactorily demonstrated that this proposal will not result in an unnecessary duplication of existing services in the area. (Conn. Gen. Stat. § 19a-639(a)(9))

35. The Hospital has demonstrated that there will be no reduction in access to services by Medicaid recipients or indigent persons. (Conn. Gen. Stat. § 19a-639(a)(10))

36. The Hospital has demonstrated that the proposal will not negatively impact the diversity of health care providers and patient choice in the greater Hartford region. (Conn. Gen. Stat. § 19a-639(a)(11))

37. The Hospital has demonstrated that the consolidation of NCI services will have a beneficial effect on health care costs and not adversely affect the accessibility to care. (Conn. Gen. Stat. § 19a-639(a)(12))

Discussion

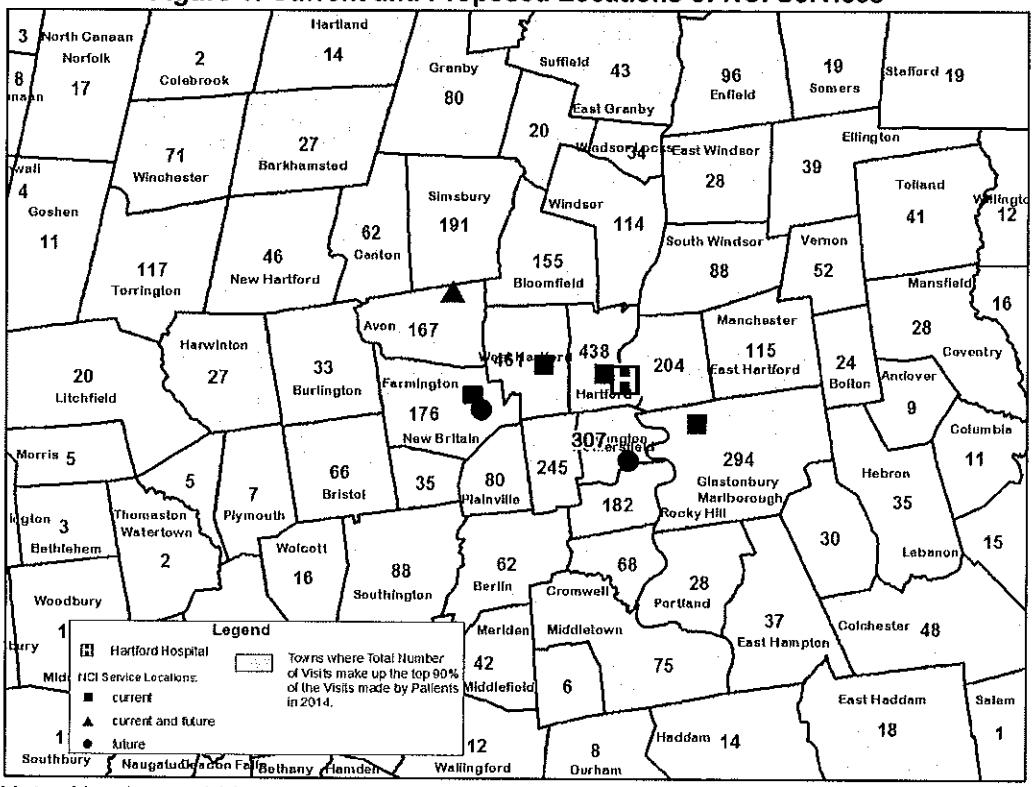
CON applications are decided on a case-by-case basis and do not lend themselves to general applicability due to the uniqueness of the facts in each case. In rendering its decision, OHCA considers the factors set forth in § 19a-639(a) of the Statutes. The Applicants bear the burden of proof in this matter by a preponderance of the evidence. *Jones v. Connecticut Medical Examining Board, 309 Conn. 727 (2013)*

Hartford Hospital is an 867-bed acute-care hospital located 80 Seymour Street, Hartford, Connecticut. *FF1* In cooperation with three private cardiology physician practices ("physician practices"), the Hospital currently offers outpatient nuclear cardiology imaging ("NCI") services at the following Connecticut locations: 100 Simsbury Road, Avon; 11 South Road, Farmington; 703 Hebron Avenue, Glastonbury; 100 Retreat Avenue, Hartford; and 65 Memorial Road, West Hartford. *FF2* The Hospital is proposing the termination of NCI services and transitioning their operation to the private cardiologists at these locations. *FF4* The Hospital will continue to provide the NCI services on its main campus. *FF6*

The Hospital has provided NCI services at the physician practice locations since 2002. *FF3* However, demand for the NCI services has declined since 2006. In fact, between 2011 and 2014, the total number of NCI scans performed at the physician practices decreased by 34% overall. The Hospital attributes the decreased demand to the application of appropriate use criteria for diagnostic testing, greater insurance company authorization requirements and the availability of alternative testing modalities. *FF7-10*

Upon cessation of NCI services by the Hospital, in addition to the NCI services available at the Hospital's main campus, two of the physician practices will continue to provide NCI services at one of their existing locations and a third physician practice will establish NCI services at one of its practice locations. The proposed service locations are: 21 South Road, Farmington; 1260 Silas Deane Highway, Wethersfield; and 100 Simsbury Road, Avon. *FF15* In addition to the Hospital, there are two hospitals that provide NCI services in Hartford and Farmington. *FF13* Fifty-nine percent (59%) of the NCI scans performed were provided to residents of the towns where the service is located or neighboring towns. *FF11* Figure 1 illustrates that the relevant population will have access to NCI services with the proposal. Figure 1 also reports the total number of NCI scans by town residents in the past four fiscal years. The Hospital remains accessible to patients who would prefer to utilize the Hospital's NCI services. With two nuclear camera systems available, the Hospital has adequate capacity to perform NCI services for these patients. *FF12* Based on the foregoing, the Hospital has satisfactorily demonstrated that the proposal will maintain access to NCI services in the region.

Figure 1: Current and Proposed Locations of NCI Services



Note: Numbers within the town's boundaries are the total number of NCI scans performed in the past four fiscal years.

With specific regard to the Medicaid population, access to NCI services provided by the Hospital will not change. *FF23-25* Also, the physician practices will continue to provide NCI services to its patients, including its Medicaid patients. *FF20* By satisfactorily demonstrating that quality and access to services in the region will be maintained for all relevant patient populations and that the proposal will reduce overall system costs by eliminating duplicative services, the Hospital has established a clear public need for this proposal.

There is no capital expenditure associated with the proposal and no operating losses are projected. *FF16&17* By reducing the number of sites providing NCI services, the proposal will be cost-effective by having fewer sites to maintain and lowering the Hospital's fixed costs. *FF22* Currently, the Hospital submits charges to payers for the technical component of the NCI services, also referred to as the facility fee. The physician practices submit charges for the professional component. With the proposal, the physician practices will continue to bill for its services. As the sites will no longer be satellites of the Hospital, a facility fee will not be included in the patient bill. *FF19* Therefore, the cost of NCI services can be expected to be lower at the physician practice locations than at the Hospital when based on Medicare reimbursement. *FF20* Consequently, the Hospital has sufficiently demonstrated that the proposal is financially feasible and will increase the financial strength of Connecticut's health care system. Additionally, the Hospital's proposal is consistent with overall goals of the Statewide Health Care Facilities and Service Plan by providing an efficient and cost-effective manner of maintaining access to quality NCI services.

Order

Based upon the foregoing Findings and Discussion, the Certificate of Need application of Hartford Hospital, Inc. to terminate outpatient nuclear cardiology imaging services at 100 Simsbury Road (Avon), 11 South Road (Farmington), 703 Hebron Avenue (Glastonbury), 100 Retreat Avenue (Hartford) and 65 Memorial Road (West Hartford) with no associated capital expenditure, is hereby **APPROVED**.

All of the foregoing constitutes the final order of the Office of Health Care Access in this matter.

By Order of the
Office of Health Care Access

February 25, 2015
Date

Janet M. Brancifort
Janet M. Brancifort, MPH
Deputy Commissioner

* * * COMMUNICATION RESULT REPORT (FEB. 27. 2015 12:17PM) * * *

FAX HEADER:

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STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH
OFFICE OF HEALTH CARE ACCESS

FAX SHEET

TO: Barbara A. Durdy

FAX: (860) 972-9025

AGENCY: Hartford Hospital

FROM: Laurie Greci

DATE: 2/27/2015

NUMBER OF PAGES: 14
(including transmittal sheet

Comment
RE: Certificate of Need Application, Docket Number 14-31955-CON
Proposal to Termination Nuclear Cardiology Imaging Services at 5 Satellite Locations

PLEASE PHONE IF THERE ARE ANY TRANSMISSION PROBLEMS.

Phone: (860) 418-7001 Fax: (860) 418-7053
410 Capitol Ave., MS#13HCA
P.O.Box 340308Hartford, CT 06134

Huber, Jack

From: Huber, Jack
Sent: Friday, March 13, 2015 2:48 PM
To: Durdy, Barbara (Barbara.Durdy@hhchealth.org)
Cc: Roberts, Karen
Subject: Notice of CON Expiration Date for the Decision Rendered under Docket Number: 14-31955-CON

Dear Ms. Durdy:

On February 25, 2015, in a final decision under Docket Number: 14-31955-CON, the Office of Health Care Access authorized a Certificate of Need ("CON") to Hartford Hospital for the termination of five outpatient nuclear cardiology imaging services located as follows: 100 Simsbury Road, Avon; 11 South Road, Farmington; 703 Hebron Avenue, Glastonbury; 100 Retreat Avenue, Hartford; and 65 Memorial Road, West Hartford. Pursuant to Section 19a-639b of the Connecticut General Statutes ("C.G.S."), *"a certificate of need shall be valid for two years from the date of issuance by this office."*

With this letter, please be advised that pursuant to Section 19a-639b, C.G.S., the current CON authorization issued under Docket Number: 14-31955-CON will expire on February 25, 2017. Please contact me at (860) 418-7069 or Karen Roberts, Principal Health Analyst at (860) 418-7041, if you have any questions regarding this notification.

Sincerely,

Jack A. Huber

Jack A. Huber
Health Care Analyst
Department of Public Health | Office of Health Care Access |410 Capitol Avenue
P.O. Box 340308 MS #13HCA | Hartford, CT 06134 |Ph: 860-418-7069| Fax: 860-418-7053| email: Jack.Huber@ct.gov