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Product Demo

Anytown Cardiac Specialists, Inc.

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ROBERTS, JOAN	DOB: 06/24/1953	January 24, 2012

INTRAVENOUS DOBUTAMINE MYOCARDIAL PERFUSION STUDY

(rest/pharmacologic stress SPECT with gated SPECT wall motion studies at rest and post-stress)

Ordering Physician: Janet Jones, MD, FACC

Clinical History: 58 year-old woman with cardiac risk factors which include age, known CAD, hyperlipidemia, and hypertension. The patient has a history of percutaneous coronary intervention. Significant pre-test symptoms include anginal equivalent. Her last Beta-blocker was administered 34 hours prior to the study. Her height is 60 inches and weight is 230 lbs, with a BMI of 45 (BSA: 2.2 m^2).

Indications for study: Anginal equivalent, known CAD (diagnostic and prognostic assessment), and percutaneous coronary intervention. **Pharmacologic indication:** Physician request.

DOBUTAMINE PHARMACOLOGIC STRESS

BASELINE ECG: Sinus rhythm at 88 bpm. PR: 0.140, QRS: 0.080, QT: 0.390, and Axis: +40. No arrhythmias. ST: normal. T waves: normal. QRS (Q waves): normal. Conduction: normal. INTERPRETATION: Normal ECG.

Dobutamine was infused over 9 minutes at a maximum rate of 20 mcg/kg/min to a peak heart rate of 142 bpm (88% MPHR). BP increased from 110/74 to 184/78 at peak stress. STRESS ECG: Sinus tachycardia. No arrhythmias during stress or recovery. The stress ECG revealed 3.0 mm downsloping ST-segment depression in leads I, AVL, and V4-V6. Conduction: normal. Testing was supervised and interpreted by Janet Jones, MD, FACC.

IMPRESSION:

1. Appropriate blood pressure response to intravenous dobutamine.
2. Appropriate heart rate response to intravenous dobutamine.
3. Patient reported chest pain.
4. Positive ECG for ischemia.
5. No arrhythmias during dobutamine infusion.

MYOCARDIAL PERFUSION IMAGING

50 minutes following the intravenous administration of 9.30 mCi of ^{99m}Tc sestamibi, resting gated SPECT myocardial perfusion imaging was performed from the RAO to LPO positions, with the patient placed in the supine position. Subsequently, dobutamine was infused and

38.20 mCi of ^{99m}Tc sestamibi was injected intravenously. 50 minutes later, post-infusion gated SPECT myocardial perfusion imaging was performed from the RAO to LPO positions, with the patient placed in the supine and (non-gated) prone positions.

TABLE 1: Myocardial Perfusion Defects

Location	Type	Extent	Severity	CV Territory
anterior	reversible	medium	moderate	LAD and/or diagonal
inferior	persistent	medium	severe	RCA/PDA

Summed stress score (SSS) = **15 (22%).** Summed rest score (SRS) = **9 (13%).** Summed difference score (SDS) = **6**, a moderate amount of reversible ischemia **(9% of total myocardium is reversibly ischemic based on SDS = 6).**

The overall technical quality of the study is good.

IMPRESSION:

1. Moderate degree of reversible ischemia in the basal to apical anterior segments, affecting a medium amount of myocardium in the LAD and/or diagonal territories.
2. Severe degree of persistent infarction in the basal to apical inferior segments, affecting a medium amount of myocardium in the RCA/PDA territory.
3. Gated SPECT wall motion study at rest demonstrates akinesis in the basal to apical inferior segments with EF = 58% and normal ESV = 54 cc. Gated SPECT wall motion study at 50 minutes post-stress demonstrates similar wall motion with EF = 56% and mildly enlarged ESV = 60 cc. Overall functional imaging assessment: abnormal.
4. The probability of a hemodynamically significant coronary artery stenosis is considered to be high (>=90% probability). These findings are most consistent with a stenosis in the LAD and/or diagonal coronary circulation. The moderate amount of reversible ischemia combined with a normal post-stress EF, mildly enlarged post-stress ESV, and a medium-sized prior infarction predicts an intermediate risk of cardiac mortality over the next 1-2 years. Clinical correlation is required.

Janet Jones, MD, FACC
(01/24/2012)

cc: W. Thomas, MD
cc: B. Smith, MD

FIGURE 1: Myocardial Perfusion Defects

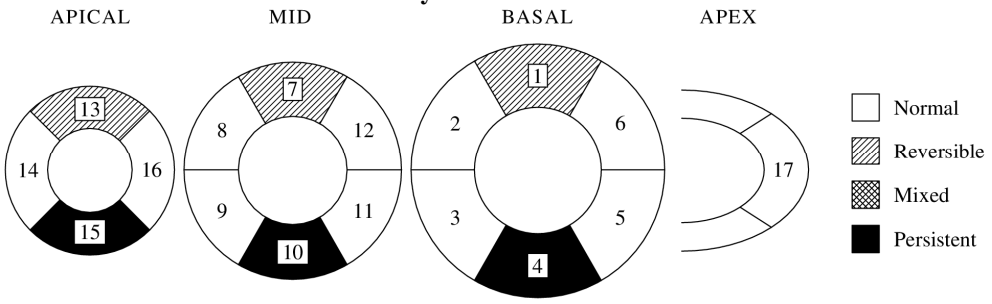


TABLE 2: Perfusion Scores (17-segment model)

SAX APICAL				SAX MID				SAX BASAL				APEX			
	#	S	R		#	S	R		#	S	R		#	S	R
ANT	13	2	0	ANT	7	2	0	ANT	1	2	0	APX	17	0	0
SEP	14	0	0	A-S	8	0	0	A-S	2	0	0				
INF	15	3	3	I-S	9	0	0	I-S	3	0	0				
LAT	16	0	0	INF	10	3	3	INF	4	3	3				
				I-L	11	0	0	I-L	5	0	0				
				A-L	12	0	0	A-L	6	0	0				

TABLE 3: Perfusion Score Legend

Score	Meaning
0	Normal
1	Mildly Reduced/Equivocal
2	Moderately Reduced
3	Severely Reduced
4	Absent Uptake

TABLE 4: Observed vs. Expected Volumes and EF

	Observed (STRESS)	Expected (STRESS)
EDV	135 cc	<= 130 cc (60 cc/m^2)
ESV	60 cc	<= 58 cc (27 cc/m^2)
EF	56%	>= 55%

I.V. Dobutamine

MYOCARDIAL PERFUSION STUDY
PHYSICIAN WORKSHEET

NAME: ROBERTS, JOAN
DOB: 06/24/53
Study Date: 1/24/12
MRN: _____
Cardiologist/ Ordering MD: J. JONES
Primary MD: W. THOMAS
CC TO: B. SMITH
ID VERIFIED BY: _____

Last β-blocker: 34 hrs ago
Height: 60 inches
Weight: 230 lbs
Gender: ☐ M ☒ F

Risk Factors
- ☒ CAD, Known
- ☐ CAD, Family History
- ☐ Diabetes
- ☐ ED
- ☒ Hyperlipidemia
- ☒ Hypertension
- ☐ Metabolic Syndrome
- ☐ Obesity
- ☐ PAD
- ☐ Renal Failure
- ☐ Smoking, Current

Special Conditions
- ☐ Asthma
- ☐ Inhalers
- ☐ Defibrillator
- ☐ Pacemaker
- ☐ _____

Cardiac History Study Indications
- ☐ Abnormal ECG
- ☐ Abnormal Stress Echo
- ☐ Abnormal Treadmill
- ☐ Arrhythmias, Atrial
- ☐ Arrhythmias, Ventricular
- ☐ Cardiomyopathy
- ☐ CHF
- ☒ CAD, Known
- ☐ Prior MI
- ☒ Prior PCI-Stent
- ☐ Prior CABG
- ☐ Viability Study
- ☐ _____
- ☐ _____

Pre-Test Symptoms Study Indications
- ☐ Chest Pain NOS
- ☐ Angina, Typical
- ☐ Angina, Atypical
- ☒ Anginal Equivalent
- ☐ Non-anginal Chest Pain
- ☐ Dyspnea
- ☐ Syncope
- ☐ _____

Other Indications
- ☐ Pre-Op Eval
- ☐ _____
- ☐ _____

DATA

Age: 58; MPHR is ____ bpm; 85% of MPHR is ____ bpm.

Dose (µg/kg/min)	STRESS	BP	HR	RECOVERY	BP	HR
0	0 min.	110/74	88	immed.	180/76	138
5	3 min.	130/76	100	2 min.	170/70	124
10	6 min.	150/80	120	4 min.	164/64	116
20	9 min.	184/78	142	6 min.	142/70	110
30	12 min.	_____	_____			
40	15 min.	_____	_____			

BP PEAK STRESS: 184/78
HR PEAK STRESS: 142

Maximum dose: 20 µg/kg/min
Total infusion time: 09:00
Isotope injected at 07:00 @ 130 bpm

☐ _____ mg Atropine given @ ____:____
☒ Atropine not given

Baseline ECG

NSR rhythm at 88 bpm
PR: .14 seconds
QRS: .08 seconds
QT: .39 seconds
Axis: +40 degrees
☐ normal
Arrhythmias: _____
ST: ☒ normal
☐ depressed in leads _____
☐ elevated in leads _____
☐ Non-Specific ST Abnormality
☐ Early Repol
T waves: ☒ normal
☐ biphasic in leads _____
☐ inverted in leads _____
☐ Non-Specific T Abnormality
☐ Flat _____
☐ Tall _____
QRS: ☒ normal
Ⓐ Conduction Abnormalities: _____
Ⓑ Q Waves: _____

Baseline ECG Interpretation
☒ Normal ECG
☐ Abnormal ECG due to: _____
☐ Borderline ECG due to: _____

Stress ECG

Rhythm S.T Arrhythmia _____
☐ No ischemic ST-T changes
☒ ST segment depression up to 3 mm with:
☐ upsloping
☐ horizontal
☒ downsloping
configuration in leads I, L, V4-V6
☐ ST segment elevation of ____ mm in leads _____
☐ New Conduction ABNL: _____
☐ New T Wave ABNL: _____

Recovery ECG

Comments: _____

Dobutamine was stopped due to:

- ☐ Angina, Non-Limiting
- ☐ Angina, Limiting
- ☐ ECG Changes (Ischemia)
- ☐ Dyspnea
- ☐ Fall in BP
- ☐ Reaching target HR
- ☐ Ventricular Tachycardia
- ☐ _____

IMPRESSION

1. ☒ Appropriate ☐ Hypertensive ☐ Blunted ☐ Hypotensive — BP response
2. ☒ Appropriate ☐ Exaggerated Increased ☐ Blunted — HR response
3. ☐ Negative ☐ Equivocal ☒ Positive ☐ Uninterpretable — ECG for ischemia.
4. ☒ No arrhythmias ☐ V. couplets ☐ PAC's ☐ PVC's ☐ V. tach. (____ beats) ☐ during ☐ after dobutamine infusion.
5. Patient Noted:
   - ☐ No symptoms
   - ☒ Chest pain/discomfort
   - ☐ General malaise
   - ☐ Dyspnea
   - ☐ _____
   - ☐ _____
   - ☐ _____
   - ☐ _____
6. _____

J. Jones
MD/PA/NP signature

TECHNOLOGIST WORKSHEET

Name: ROBERTS, JOAN DOB: 06/24/1953

Study Date: 01 (MM) / 24 (DD) 2012 (YYYY)

Study Type: DOBUT MPI

Patient's Height: 60 inches

Weight: 230 lbs

Gender: ☐ Male ☒ Female

Patient ID on Modality: _____

Female patient bra/cup size: 40 / D

Breast Surgery: YES / (NO)

Location: LEFT / RIGHT

Describe: _____

REST IMAGING

REST DOSE: 9.3 mCi

INJECTION TIME: 10 HH : 15 MM

SCAN START TIME: 11 HH : 05 MM

Pharmaceutical:
- ☒ Sestamibi
- ☐ Tetrofosmin
- ☐ Rubidium-82
- ☐ Thallium

Rejected / Total Beats: 0 / _____

Basketball Motion: YES / (NO)

Upward Creep: YES / (NO)

Acq. Gating Failure: YES / (NO)

MoCo estimate from review of raw REST data:

☒ NONE ☐ MODERATE*

☐ MILD ☐ SEVERE*

STRESS IMAGING

STRESS DOSE: 38.2 mCi

INJECTION TIME: 12 HH : 10 MM

SCAN START TIME: 13 HH : 00 MM

Pharmaceutical:
- ☒ Sestamibi
- ☐ Tetrofosmin
- ☐ Rubidium-82
- ☐ Thallium

Rejected / Total Beats: 0 / _____

Basketball Motion: YES / (NO)

Upward Creep: YES / (NO)

Acq. Gating Failure: YES (NO)

MoCo estimate from review of raw STRESSdata:

☒ NONE ☐ MODERATE*

☐ MILD ☐ SEVERE*

*** Note: Moderate or Severe cardiac motion requires IMMEDIATE repeat imaging.**

Stress prone imaging performed: (YES) / NO

Attenuation correction: _____

Repeat imaging start times:

_____ HH : _____ MM REST / STRESS

_____ HH : _____ MM REST / STRESS

Notes: _____

X _____

Technologist initials

PERFUSION RESULTS

Name: ROBERTS, JOAN DOB: 06/24/1953

Prone performed: (YES) / NO

SSS: 15

SRS: 9

SDS: 6

TID ratio: 1.09

☐ TID is abnormal

Perfusion Results:

☐ Normal

☒ Abnormal

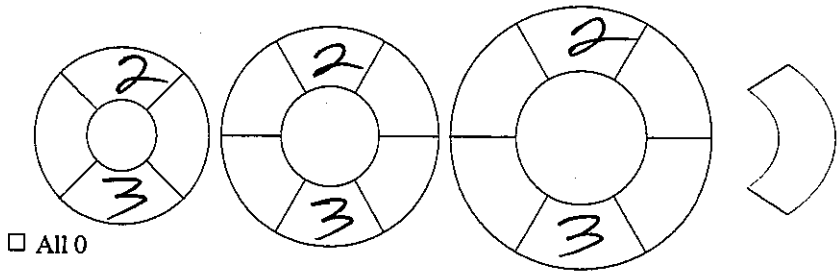
☐ LVH

☐ RVE

☐ RVH

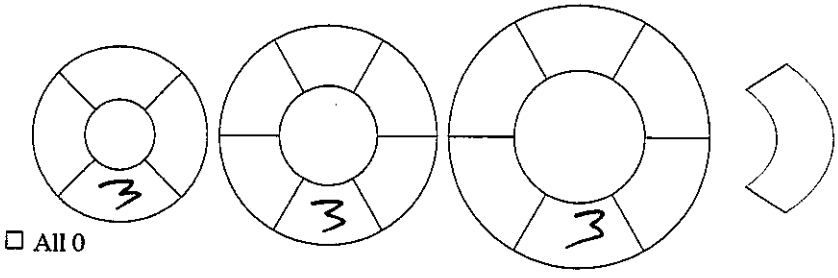
Attenuation ☐ BREAST ☐ INFERIOR

STRESS



☐ All 0

REST



☐ All 0

SEGMENTAL PERFUSION DEFECTS								TYPE	EXTENT	SEVERITY	CVT
A	BASAL	A	AS	IS	I	IL	AL	(REVERSIBLE)	SMALL	MILD	(LAD)
	MID	A	AS	IS	I	IL	AL	PERSISTENT	(MEDIUM)	(MODERATE)	(DIAGONAL)
	APICAL	A	S		I		L	MIXED	LARGE	SEVERE	LCX
	APEX				APEX						RCA/PDA
B	BASAL	A	AS	IS	(I)	IL	AL	REVERSIBLE	SMALL	MILD	LAD
	MID	A	AS	IS	(I)	IL	AL	(PERSISTENT)	(MEDIUM)	MODERATE	DIAGONAL
	APICAL	A	S		(I)		L	MIXED	LARGE	(SEVERE)	LCX
	APEX				APEX						(RCA/PDA)
C	BASAL	A	AS	IS	I	IL	AL	REVERSIBLE	SMALL	MILD	LAD
	MID	A	AS	IS	I	IL	AL	PERSISTENT	MEDIUM	MODERATE	DIAGONAL
	APICAL	A	S		I		L	MIXED	LARGE	SEVERE	LCX
	APEX				APEX						RCA/PDA
D	BASAL	A	AS	IS	I	IL	AL	REVERSIBLE	SMALL	MILD	LAD
	MID	A	AS	IS	I	IL	AL	PERSISTENT	MEDIUM	MODERATE	DIAGONAL
	APICAL	A	S		I		L	MIXED	LARGE	SEVERE	LCX
	APEX				APEX						RCA/PDA

FUNCTION RESULTS

Name: ROBERTS, JOAN DOB: 06/24/1953

STRESS

EDV: 135
ESV: 60
EF: 56

Global Hypokinesis: ☐ MILD ☐ MODERATE ☐ SEVERE

☐ Stunning

Dyssynchronous: ☐ CABG ☐ PACED ☐ LBBB

REST

EDV: 130
ESV: 54
EF: 58

Global Hypokinesis: ☐ MILD ☐ MODERATE ☐ SEVERE

Dyssynchronous: ☐ CABG ☐ PACED ☐ LBBB

	APICAL	MID	BASAL	APEX
STRESS ☐ GATING NOT DONE	4	4	4	
☐ All 0				
REST ☐ GATING NOT DONE	4	4	4	
☐ All 0				

☐ ISCHEMIC CARDIOMYOPATHY ☐ NON-ISCHEMIC CARDIOMYOPATHY

Current probability of a hemodynamically significant coronary artery stenosis: ☐ < 10% ☒ ≥ 90% ☐ ≥ 99% ☐ 60% – 89% ☐ ≥ 95%

PREDICTED STENOSES

A	UNSPECIFIED	LAD
	MILD to MODERATE	DIAGONAL
	MODERATE to SEVERE	LCX
	SEVERE to CRITICAL	RCA/PDA
B	UNSPECIFIED	LAD
	MILD to MODERATE	DIAGONAL
	MODERATE to SEVERE	LCX
	SEVERE to CRITICAL	RCA/PDA
C	UNSPECIFIED	LAD
	MILD to MODERATE	DIAGONAL
	MODERATE to SEVERE	LCX
	SEVERE to CRITICAL	RCA/PDA
D	UNSPECIFIED	LAD
	MILD to MODERATE	DIAGONAL
	MODERATE to SEVERE	LCX
	SEVERE to CRITICAL	RCA/PDA

OVERRIDE AUTOMATIC CALCULATIONS:

STRESS		REST	
ESV	EF	ESV	EF
NORMAL	NORMAL	NORMAL	NORMAL
ELEVATED	REDUCED	ELEVATED	REDUCED
MARKEDLY ELEVATED	SEVERELY REDUCED	MARKEDLY ELEVATED	SEVERELY REDUCED

Risk of cardiac mortality within next 1 to 2 years:

☐ Very Low ☒ Intermediate ☐ Low ☐ High

Add to impression: