Cath Lab Digest

A Product, News and Clinical Update for the Cardiac Catheterization Laboratory Specialist

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Left to right, front to back: Ben Glorioso, Brenda Shortt, Jason Rogers, Steve Rodriguez, Tom Forrester, Eva DeLeo, Teresa Cannon, Marsha Lang, Bob Roper, Viet Do, Sage Loebs, Kevin Vierra

CATH LAB SPOTLIGHT

Sutter Medical Center - Sacramento

Brenda McCulloch RN MSN, Cardiovascular Clinical Nurse Specialist, Carol Prinzo RN, Cath Lab Director, and Margaret Mette RN MN, Assistant Administrator, Sacramento, California

Sutter Medical Center, located in California's capital city Sacramento, is a 550-bed, two-campus, tertiary care facility that serves patients throughout the greater Sacramento-Sierra region.

Sutter is proud of our many cardiovascular "firsts" in the greater Sacramento region: First successful open heart surgery on adults and children, first heart transplant, first coronary angioplasty, first electrophysiology study, first transmyocardial laser revascularization, first minimally invasive coronary bypass surgery, first extracorporeal membrane oxygenation (ECMO) and treatment with nitric oxide to newborns with lung dysfunction,

See SPOTLIGHT, page 22

CLINICAL UPDATE

Non-invasive Testing is Not Specific Enough:

Why and How to Obtain Objective Signs of Ischemia in the Cath Lab

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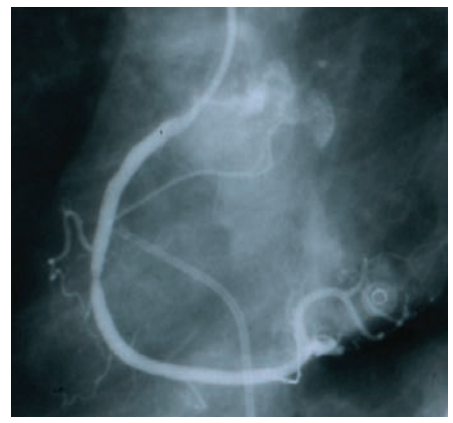


Why do we need an invasive assessment of ischemia? In effect, this question can be further divided into two questions: 1. Do we need assessment of ischemia, and if we do; 2. How is functional information about ischemia obtained? Why should it be invasive?

Question 1.: Do we need assessment of ischemia?

Let's start with two provocative examples.

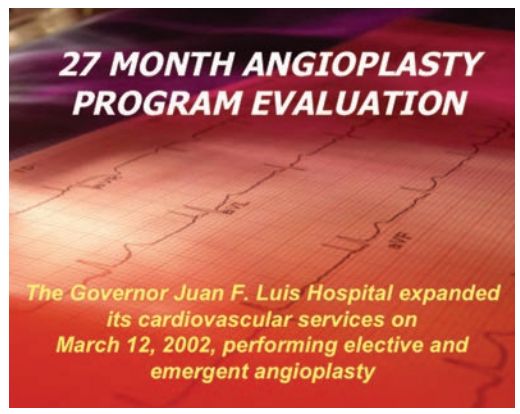
See INVASIVE ASSESSMENT, page 12

OFF-SITE OPEN HEART BACKUP

Cardiovascular Laboratory Performance Improvement:

A 27-Month Angioplasty Program Evaluation

Submitted by Jill Price RN, Head Nurse Cardiovascular Lab/Cardiology
Governor Juan F. Luis Hospital and Medical Center
St. Croix, United States Virgin Islands



See PERFORMANCE IMPROVEMENT, page 6

OFF-SITE OPEN HEART BACKUP

Cardiovascular Laboratory Performance Improvement:

A 27-Month Angioplasty Program Evaluation

Submitted by Jill Price RN, Head Nurse Cardiovascular Lab/Cardiology
Governor Juan F. Luis Hospital and Medical Center
St. Croix, United States Virgin Islands

The following presentation was created by the Cardiovascular Laboratory Team: Dr. Kendall Griffith, Dr. Michael Potts, Dr. Dante Galiber, Dr. Roy Arcamo, Jill Price RN, Lorie Trotman RN, Zanna Gardner RN, Fernando Suarez RT

Should angioplasty and stent placement (PCI) be done in a hospital without on-site open heart surgery? This question is plaguing the entire United States right now. However, when you are an island in the middle of the Caribbean Sea and you do not have an open heart surgery program, then PCI or thrombolytics could be the only choices that your patients may have to survive.

In June 2000, a cardiovascular laboratory was opened at the Governor Juan F. Luis Hospital and Medical center in St. Croix, United States Virgin Islands. At that time, only diagnostic procedures were being conducted. However, with the diagnostic lab in place, and the continued use of TPA during acute MIs, the mortality rate for patients experiencing an MI was still on the rise. The physicians and hospital administration determined that in order to provide quality care to patients experiencing an acute MI, then an angioplasty program without on-site open heart back up would need to be established.

In March 2002, an angioplasty program was established at our facility, as Interventional Cardiologist Kendall Griffith MD, FACC, joined our team. We developed a plan for elective and emergent PCI utilizing open heart surgery in Puerto Rico, a 35-minute flight away.

This program has dramatically decreased our mortality rate, and provided better quality care to those patients experiencing an acute MI. The future plans of the cardiovascular program are currently being established and will include on-site open heart backup. In the meantime, we continue to provide PCI services without on-site open heart backup. The following is an evaluation of the program to date. **CLD**

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L-R: Fernando Suarez RT, Roy Arcamo MD, Michael Potts, MD (Chief of Cardiology), Zanna Gardner RN, BS, Dante Galiber MD, FACC, Lorie Trotman RN, BSN, Kendall Griffith MD, FACC (Director of the Cath Lab & Medical Director), and Jill Price RN, Head Nurse Cath Lab/Cardiology.

Fernando Suarez RT

L - R: Zanna Gardner RN BS, Fernando Suarez RT, Kendall Griffith MD, FACC (Director of Cath Lab/Medical Director).

Jill Price RN (Head Nurse Cath Lab/Cardiology).

Lorie Trotman RN, BSN

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See PROGRAM EVALUATION, page 8

PROGRAM EVALUATION *Continued from page 6*

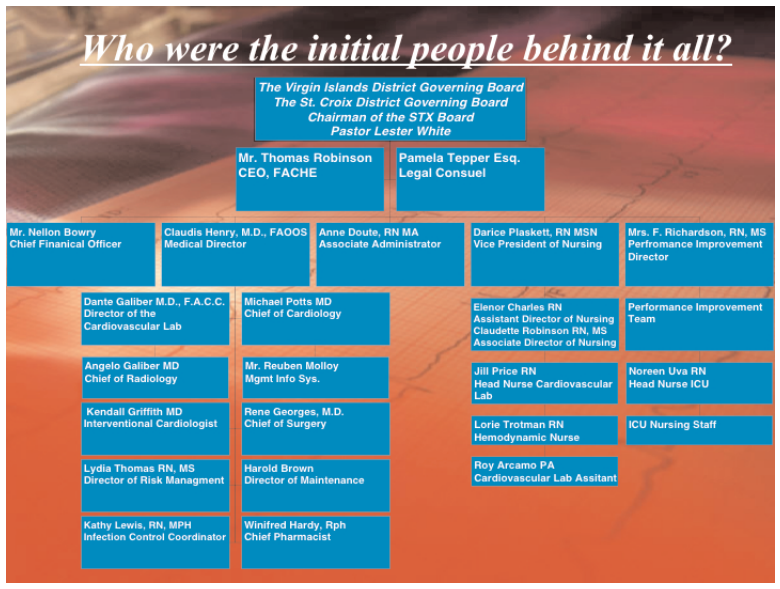
GJFLH's past mode of therapy

- Past mode of therapy (prior to 3/02): thrombolysis.
- Only 33% of patients are eligible and only 80% of vessels open after thrombolysis.
- Only 55% of vessels achieve clinically significant blood flow.
- Rates of recurrent chest pain and strokes are high.
- Primary angioplasty is effective 95-99% of the time.
- Patients who did receive thrombolysis and continue to have chest pain benefit from angioplasty and stent placement. In these patients PTCA reduces the incidence of MI, rehospitalization, and use of anti-ischemic drugs.
- Patients who receive unsuccessful thrombolysis face possible death, cardiomyopathy and congestive heart failure.

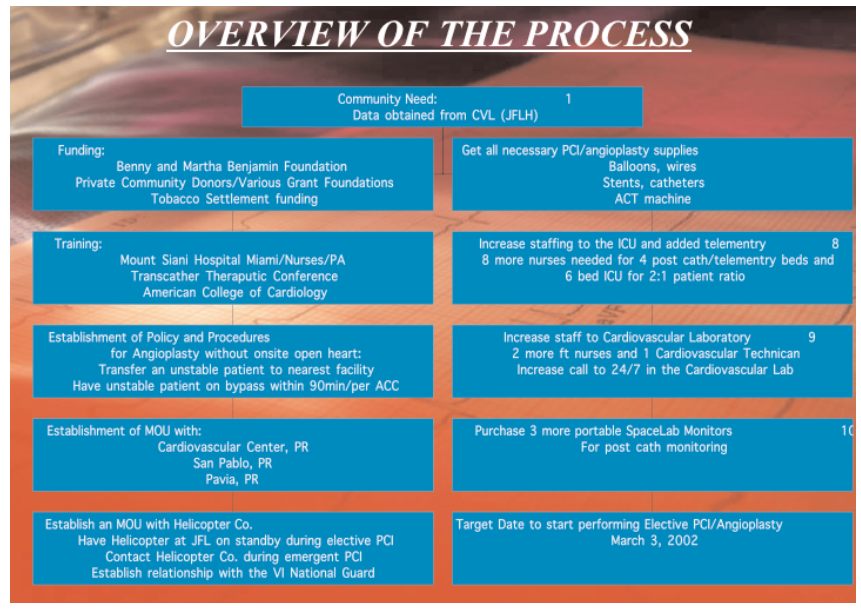
PLAN

- Since the opening of the Cardiovascular Laboratory on June 1, 2000:
  - Cardiovascular disease is still the leading cause of death in the US Virgin Islands.
  - 31 % of 159 cardiac catheterizations from 6/00 to 3/02 were still sent off Island for angioplasty and 9% for bypass, leaving a total of 40 % having to travel off-island.
- A plan to develop an angioplasty program on St. Croix in the existing cardiovascular laboratory was designed to:
  - Decrease the number of patients still having to travel off-island for cardiac care.
  - Allow patients with AMI to receive immediate reopening of the coronary vessel that is occluded.
  - To decrease morbidity and mortality rates in the Virgin Islands

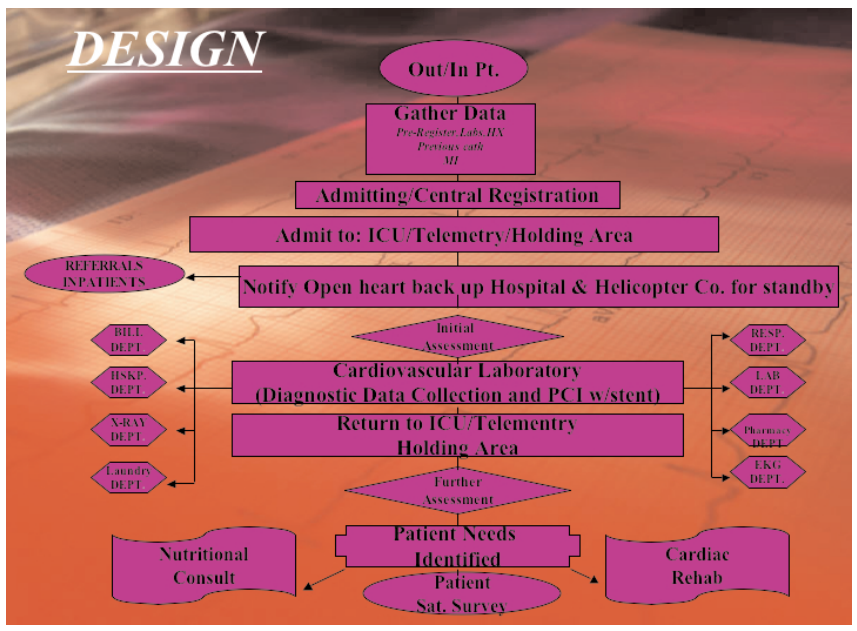
Who were the initial people behind it all?



OVERVIEW OF THE PROCESS



DESIGN



MEASURING THE STATISTICS

BEFORE PCI

- Amount of patients traveling off-island from 6/00 to 3/02
- 159 cardiac catheterizations performed.
- 31%off-island for PCI
- 9%off-island for bypass

AFTER PCI

- Amount of patients traveling off-island from 3/02 to 6/04
- 505 cardiac catheterizations performed (562 total procedures performed).
- 0.4%off-island for PCI.
- 9.0% transferred off-island for bypass.

Assessing the Statistics

BEFORE PCI:

Mortality Rate

- *71% for Acute MI*

From 12/01 to3/02

5 out of 7 patients died from sudden cardiac death/arrest secondary to acute MI

(Data measured for 96 days)

AFTER PCI:

Mortality Rate

- *0.9% for Acute MI*

From 3/02 to 6/04

No deaths occurred secondary to an angioplasty or diagnostic case.

(Deaths occurred due to severe myocardial damage secondary to acute MI)

Improvement Statistics To Date

- *Number of elective angioplasties performed: 33*
- Success rate: 100%. Complications: zero
- *Number of emergent angioplasties: 60*
- Success rate 99.8%. Complications: two

Coronary artery dissection=1
(during emergent angioplasty)
percentage = 0.1%

No-reflow of the coronary artery=1
(post emergent angioplasty)
percentage=0.1%

See PROGRAM EVALUATION, page 10

PROGRAM EVALUATION *Continued from page 8*

Evaluation of Time to PCI

- Several factors were measured when determining the time to PCI
- Average time per case from ER door to PCI = *2 hours, 42 minutes*
  - Based on ST-segment elevation MIs from the ER only (13 patients with ST segment elevation MIs, out of 60 emergent MIs)
- **Measurable Data**
  - Wait time to see the ED physician from triage *(average 32 minutes)*
  - Wait time for ED physician to call cardiologist *(1 hour, 21 minutes)*
  - Time from triage for EKG and labs *(55 minutes)*
  - Wait time from when cardiologist was called until the patient was on the table in the cath lab *(1 hour 12 minutes)*

OVERALL EVALUATION/STATISTICS

- Procedures performed to date 6/04: n737
- Emergent angioplasties: n60
- Elective angioplasties: n33
- Pacemaker insertions: n43
- Reveal implantation: n2
- Internal cardiac defibrillator implants: n5

OVERALL EVALUATION/COMPLICATIONS

- Hematoma: n25 = 3 % (all small hematomas; No pseudoaneurysms; No retroperitoneal bleed)
- Vagal response: n6 = 0.8%
- Contrast infiltration/reaction: n4 = 0.5%
- Equipment failure: n7 = 0.5%
- Vtach/Vfib/Bradycardia: n7 = 0.9%
- Death: n7 = 0.9% (not related to procedure diagnostic or interventional)
- Coronary artery dissection: n1 = 0.1% (during emergent PCI)
- No-reflow of the coronary artery: n1 = 0.1% (post emergent PCI)
- Acute closure of the coronary: n1 = 0.1% (during diagnostic)
- Femoral artery dissection: n1 = 0.1% (during diagnostic)
- Minor CVA with recovery: n 2 = 0.2% (one post PCI, one post diagnostic)
- Pneumothorax: n 1 = 0.1% (post permanent pm implant)
- Infection after PM or ICD implant: n 0 = 0%
- Infection post diagnostic in femoral artery area (groin area): n 2 = 2%

Monitoring the Fluoroscopy time Data

- Investigate why Physician A has an increase in fluoroscopy time average per case.
- Provide a radiation education in-service for all staff and physicians.
- Determine ways to decrease the total amount of fluoroscopy time per case.
- Review and monitor radiation exposure reports monthly, quarterly, and annually.
- Continue wearing personal lead protection devices.
- Rotate staff on and off the table and circulating.

Improvement Needs for PCI

- Improvement Needs:
  - To decrease the average time to PCI from 2 hours 42 minutes to 60 minutes (Golden Hour: Door-to-Door)
- Educational Needs:
  - Education to begin immediately with all ED physicians and nurses by Dr. Kendall Griffith (interventionalist) on what critical pathway factors need to be present in order to notify the interventionalist first.
  - Public education on signs and symptoms of an acute MI
  - Educate the public to call 911 if there are signs and symptoms of an MI.

St. Thomas/St. John Patients

- Total patients= n50
- Emergent PCI patients = n13
- Elective patients = n 37 cases
- Breakdown of procedures:
  - Pacemaker = n6
  - LHC = n41
  - RHC = n7
  - PCI = n13
  - IVUS = n1
  - IABP = n1

Fluoroscopy Time Monitored (2004 1st Trimester)

- Physician A = 307.5 minutes total
  - 15 cases total = Average 20.5 minutes per case
- Physician B = 60 minutes total
  - 8 cases total = Average 7.5 minutes per case
- Physician C = 190.4 minutes total
  - 26 cases total = Average 7.3 minutes per case

A Heart Attack Could Occur at Anytime with Anyone

Your life-saving team!

What an improvement for the Islands and GJFLH!

Future Plans include a Cardiovascular Center of Excellence!

Jill Price, RN, can be contacted at JPrice@jflusvi.org.

CLD