

Matters of the Heart Mayo Health System La Crosse

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- Atherosclerotic heart and vascular disease
- Heart ultrasound (echo)
 Pacing for heart rhythm problems



Symptoms of heart disease

- Jaw or neck pains
- Chest "burning"
- Shoulder pains
- Arm pains (especially medial aspect)
- Dyspnea on exertion
- Reduced, and especially worsening effort tolerance
- Any of the above with new ECG abnormalities



New approaches to cardiac evaluation

- Minimizing risk
- Making procedures more comfortable for patients
- Improving quality of life

- 1. Radial procedures in cath lab
- 2. Biplane images to reduce contrast



Angiography (Dye Exam)





Radial Access





Radial Access—Making Procedures Safer **and** Easier





Minimizing Dye—Biplane Angiography









Acute Myocardial Infarction





STEMI Kaizen Go Forward Plan				
Task Name	Start Date	End Date	Owner	Comments/Updates
Cath Lab/SPU				
- Cap Code Paging	7/2/2014	Ongoing	Melissa/Cailin	
- Standard Work for Staff Response to STEMI Page	6/26/2014	Ongoing	Melissa/Cailin	
- Written	6/5/2014		Melissa/Mary Sue	
- Trained/Implemented	6/26/2014		Melissa	
- Begin tracking staff reponse time from STEMI Page	8/15/2014	Ongoing	Melissa/Mary Sue	
- Cardiologist to call "99" line from outside when returning a page	6/9/2014	Ongoing	Mary Sue/Cailin	
- Standard Work for RT to open lab and start equipment				
- Written	6/5/2014		Josh/Keith	
- Trained	7/25/2014	8/14/2014	Josh/Keith/Kim/RT	
- Implemented	8/15/2014		Josh/Keith/Kim/RT	
- Standard Work for Transport and Set Up of Patient in Cath Lab with NOC Support				
- Written	6/5/2014		Melissa/Mary Sue	
- Trained	7/9/2014	8/15/2014	Melissa/Becky/NOCs	
- Implemented	8/15/2014		Melissa/Becky/NOCs	
Registration				
- Standard work for quick registration	6/5/2014	Ongoing	Jane	
EUCC				
- Develop Core Triage Group	10/12/2014	4/2/2015	Janelle	Classes scheduled 11/13 and 11/24- 3/25
- Standard Work for Quick Triage			Janelle/Aaron/Keith/Kin	Janelle: Individual feedback being given
- Standard Work for Arm Band			Janelle/Aaron/Keith/Kim	Reg staff tracking standard work
- Standard Work for Rooming and Triage			Janelle/Aaron/Keith/Kin	
- Plan Pilot for Staffing, Flow			Janelle/Aaron/Keith/Kin	1
- STEMI Standard Work			Janelle/Aaron/Keith/Kin	
- EUCC Physician Standard Work		12/15/2014	EUCC/Cardiology	Development in Progress
RT				
- Train EUCC Tech Staff ECG procedure		12/15/2014	Keith/Kim/Janelle	11/10 Trained- Competency in progress
- Trained		12/15/2014	Keith/Kim/Janelle	
- Implemented		12/15/2014	Keith/Kim/Janelle	
Leadership				
- Develop Leadership Standard Work			Terre	
- Weekly meeting at performance board	7/18/2014		Terre	
Miscellaneous			_	
- Involve ARC in STEMI Call	Mtg 08/18	9/22/2014	Team	Mary Sue: Follow up from call 09/29/2014
- Overhead page to EUCC only	8/18/2014	12/15/2014	Team/Operators	Nancy:10/
STEMI Kaizen Go Forward Plan				
Task Name	Start Date	End Date	Owner	Comments/Updates
Monitor/Track Page to Cath Lab Arrival (STEMI transfer standard work)	10/21/2014		Janelle/Mary Sue	
Track triage standard work on performance board (tally sheet from registration)			Janelle	
Add process map to board	11/10/2014	Ongoing	Melissa	
Monitor/Track Reason for Delay to cath lab	1/5/2015	Ongoing	Kim/Keith	
Tristate Ambulanace implementation of STEMI called at scene	1/5/2015	2/18/2015	Mary Sue/Janelle	
Create Cath Lab RN and CV tech standard work document	2/16/2015	3/2/2015	Paul/Melissa	Meeting 03/18/2015



Door to Device Time (Minutes) for STEMI from EUCC from 01/13-12/15 Goal <=90 Minutes Average Minutes: Pre-Kaizen 87 Post-Kaizen 68





Peripheral Vascular Disease

- Affects 10 million people
- Risk Factors: smoking, diabetes, high cholesterol, high blood pressure
- Associated with higher risk of heart attack and stroke
- Screening and treatment of risk factors are critical



Vascular Exam—ABI test





0.28

0.50

0.26

1.86

0.28

1.60

1.60

0.85

0.66

0.80

1.55

1,00

0.50

0.60

0.55

1.50

1.66

0.50

0.66

0.55

0.78

0.50

0.25

0,66

0.25



0.75

0.50

0.25

0.00

0.25

0.75

0.50

0.28

0.00

0.25

0.75

0.60

0.25

0.00

0.25

0.75

0.90

0.25

0.00

0.25

0.75

0.50

0.25

0.00

0.25



Reasoning for "Statin" Usage





"Statins"



























Echocardiography

Echocardiogram



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Mitral Valve Regurgitation





3 Dimensional Echocardiography





Intracardiac Echo (ICE)









Atrial Fibrillation

- Paroxysmal
- Persistent
- Chronic
- Loss of efficiency can result in shortness of breath
- Palpitations, chest discomfort, "jitteryness"
- Rapid heart rate causes cardiac deterioration
- Loss of cardiac synchrony can result in stroke



Point-by-Point Ablation



Point by Point Ablation

Point-by-Point Ablation



1000047-06

Point-by-Point Ablation











Balloon







AV Nodal Reentrant Tachycardia

Ablation target: Slow pathway. Anatomical location: inferior to the compact AV node. Just superior to the coronary sinus ostium or anterior to it. Success: 95-97%. Recurrences: Less than 5%. Main Complication: Damage to compact AV node.





Electrocardiography and Pacing Seymour Furman

- Developed the temporary transvenous ventricular lead as a surgical resident (1958)
- The temporary pacemaker that he used was line-powered and needed to be wheeled on a cart
- The patient could ambulate as far as the electrical power cord would allow
- Made innumerable contributions to the art and science of pacing
 - He felt strongly about sharing his ideas in the public domain (publishing) and was opposed to patents





Arne Larsson (1915 – 2001)

- At the age of 43, he was admitted to the Karolinska Hospital with recurrent fainting spells – upwards of 30/day associated with "Stokes Adams attacks"
- He had been in the hospital for months when his wife heard about work being done by Dr. Ake Senning and Dr. Rune Elmqvist on pacemakers
 - His wife Else contacted Dr. Ake Senning and pleaded with him to make a pacemaker for her husband

 Drs Senning and Elmqvist knew the problems with an external device so felt that it should be internal as Arne's condition was not temporary and would require chronic therapy

• They placed the circuitry in a Kiwi shoe polish can and backfilled it with medical grade epoxy (Araldite)



Arne Larsson October 2, 1958

Dr. Elmqvist made two pacemakers

- Dr. Senning did not realize (nor did anyone) that electrocautery could damage the transistors (of which there were two)
 - In that the need for pacing was intermittent, three hours after the first surgery, Mr. Larsson had another spell and the pacemaker was non-functional.
- Although not on the same calendar day, within the first 24 hour period, Mr. Larsson also received the world's second fully implanted pacemaker





Then and Now

38 cc, 83 grams 24 cm², 16 mm thick 2 transistors Longevity - < 1 yr 12 cc, 29 grams 19 cm², 6.0 mm thick 20,000,000+ transistors Up to 20 years, at least 5 yr





Pacemakers







The Nanostim: A Leadless Ventricular Pacemaker





Cardiac Defibrillator





Happy Valentines Weekend, Thank You!





Questions, Anyone?



