

3M Infection Prevention Solutions
Learning Connection



Congestive Heart Failure & Pulmonary Edema

Gayle Anderson , RN, BSN

November 11, 2013



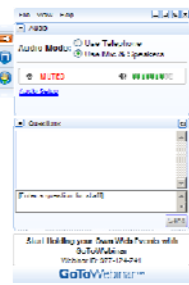
© 3M 2013. All Rights Reserved

House Keeping

Questions

From the GoToWebinar page:

- Click on the orange box with a white arrow to expand your control panel (upper right-hand corner of your screen).
- Type a question in the question box and click send.




© 3M 2011. All rights reserved.

House Keeping

Continuing Education

Each 1 hour web meeting qualifies for 1 contact hour for nursing. 3M Health Care Provider is approved by the California Board of Registered Nurses CEP 5770.

Post webinar email:

- Link to Course Evaluation
- CE Certificate Included
- Forward eMail to Others in Attendance



© 3M 2011. All rights reserved.

Disclosure

Gayle Anderson is a consultant for 3M

© 3M 2011. All rights reserved.



Congestive Heart Failure & Pulmonary Edema



www.ayle-disease.blogspot.com

• Gayle Anderson RN, BSN

© 3M 2011. All rights reserved.



Objectives

- What is Congestive Heart Failure
- Reasons for Congestive Heart Failure
- What are the signs & symptoms of Congestive Heart Failure
- Management & Treatment of Congestive Heart Failure

© 3M 2011. All rights reserved.



Objectives

- What is Pulmonary Edema
- Reasons for Pulmonary Edema
- What are the signs & symptoms of Pulmonary Edema
- Management & Treatment of Pulmonary Edema

© 3M 2011. All rights reserved.



Polling Question #1

- What is your current role?
 - Caregiver
 - Caregiver Educator
 - Caregiver Manager
 - Infection Preventionist

© 3M 2011. All rights reserved.



Did you know?

- More than 3 million people have congestive heart failure
- 400,000 new patients present yearly
- Approximately 30-40% of patients with CHF are hospitalized every year
- CHF account for 45% of all deaths

© 3M 2011. All rights reserved.

www.bradleyrealtyllcs.com



What is Congestive Heart Failure

- CHF is generally defined as inability of the heart to supply sufficient blood flow to meet the body's needs
- It occurs most commonly when the cardiac output is low.
- Either or both of the Right or Left ventricle become damaged or overloaded

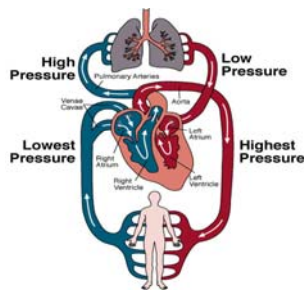


© 3M 2011. All rights reserved.

www.thehiddenlists.com

Congestive Heart Failure

- Left sided failure
 - Left ventricle two types of failure
 - **Systolic failure**
 - **Diastolic failure** (also called diastolic dysfunction)



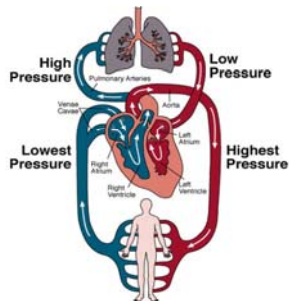
© 3M 2011. All rights reserved.

http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/Types-of-Heart-Failure_UCM_306323_Article.jsp

3M

Congestive Heart Failure

- Right sided failure
 - Right-sided or right ventricular (RV)



© 3M 2011. All rights reserved.

http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/Types-of-Heart-Failure_UCM_306323_Article.jsp

3M

Congestive Heart Failure

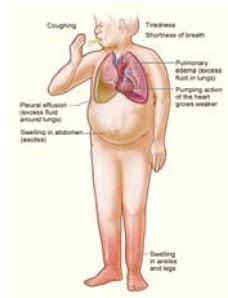
- Symptoms of heart failure often begin slowly.
- Over time, you may notice breathing problems and other symptoms even when you are resting.
- Symptoms may also appear suddenly after the heart is damaged from a heart attack or other problems.

© 3M 2011. All rights reserved.

3M

Congestive Heart Failure

- Cough
- Fatigue
- Appetite
- Urination
- Pulse
- Shortness of breath
- Liver
- Edema
- Waking up
- Weight gain



www.scary-pictures.medlinet.com

3M

© 3M 2011. All rights reserved.

Diagnostic testing for CHF

- Breathing status
- Edema
- Neck veins
- Lung sounds
- Swelling
- Heart



© 3M 2011. All rights reserved.

http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001211/medan_000158_disease_symptoms

3M

Polling Question #2

- How applicable is this topic (CHF and Pumonary Edema) to your daily work?
 - Not Applicable
 - Very Little
 - Somewhat
 - Mostly
 - Very Much



© 3M 2011. All rights reserved.

TREATING CONGESTIVE HEART FAILURE



Unload Fast!

- Upright Position
- Nitrates
- Lasix
- Oxygen
- ACE Inhibitors
- Digoxin
- Fluids (Decrease)
- Afterload (Decrease)
- Sodium Restriction
- Test (Dig Level, ABGs, Potassium Level)

© 2007 Nursing Education Consultants, Inc.

© 3M 2011. All rights reserved.

http://www.ncbi.nlm.nih.gov/pubmed/health/PW0002211/abstract_000228-disease_symptoms



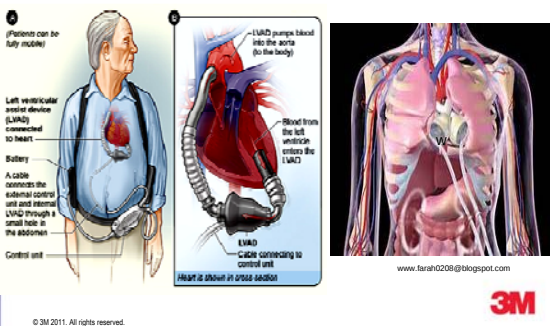
Surgical Treatment for CHF

- Coronary bypass surgery (CABG) or angioplasty
- Heart valve surgery
- A pacemaker
 - Cardiac Resynchronization Therapy
 - Optivol® Fluid Status Monitoring
 - A defibrillator
- END-STAGE HEART FAILURE
 - Intra-aortic balloon pump (IABP)
 - Left ventricular assist device (LVAD)

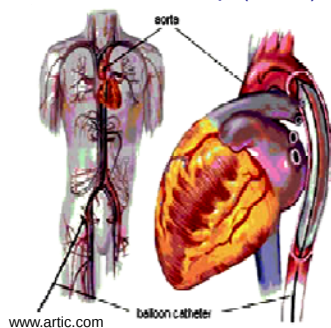


© 3M 2011. All rights reserved.

Left Ventricular Assist Device (LVAD) & Artificial Heart



Intra-Aortic Balloon Pump (IABP)



Case study #1

- 65 y/o male presents to the ER
- Chief complaint
 - Shortness of breath over past two months
 - Swelling of his ankles'
 - Nonproductive cough
 - 30 lb weight gain over past two months
 - Full feeling in his abdomen

Triage Question??

- How would you classify this patient based on his presentation?
- Emergent or Non-emergent??



© 3M 2011. All rights reserved.

Case Study #1

- History
 - MI 4 years ago with two stents placed
 - Hypertension
 - Smoker for 35 years
 - Hyperlipidemia
- Medications
 - Lisinopril
 - Baby ASA
 - Crestor



© 3M 2011. All rights reserved.

Case Study #1

- Physical exam
 - Lung Sounds
 - Bilateral Rales
 - Abdominal
 - Firm and slightly distended
 - Upon palpation of the liver you note distended neck veins
 - Lower extremities
 - +3 pitting edema



© 3M 2011. All rights reserved.

Case Study #1

- Lab Tests Completed
 - CBC
 - Chem 14
 - BNPRO
 - BUN
 - urinalysis
- X-ray
 - Chest X-ray
- Echocardiogram
- 12-lead EKG



www.3m.com



© 3M 2011. All rights reserved.

Case Study #1

- Lab Tests
 - CBC -Unremarkable
 - Chem 14- Unremarkable
 - BNP- 621
 - BUN- Unremarkable
 - Urinalysis- Unremarkable
- BNP levels below 100 pg/mL indicate no heart failure
- BNP levels of 100-300 suggest heart failure is present
- BNP levels above 300 pg/mL indicate mild heart failure
- BNP levels above 600 pg/mL indicate moderate heart failure.
- BNP levels above 900 pg/mL indicate severe heart failure.

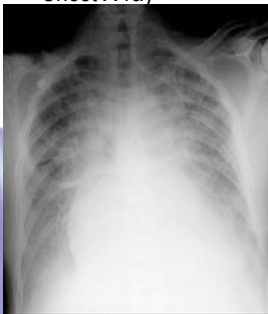
http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001211/heart_000158_disease_symptoms

© 3M 2011. All rights reserved.



Case Study #1

- Chest X-ray



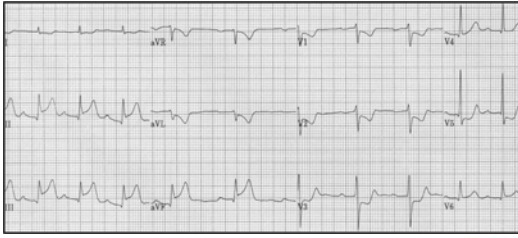
- Echocardiogram
 - EF of 25-30%



http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001211/heart_000158_disease_symptoms

Case Study #1

- 12-lead EKG



www.ems12lead.com

© 3M 2011. All rights reserved.

3M

Helpful Tips for ECG

Side note for 12-leads:

- Prep the skin well
- Place electrodes in proper placement
- Use high quality electrodes

© 3M 2011. All rights reserved.

3M

Case Study #1

- Mediations typically started in addition to already prescribed meds:
 - Digoxin
- 0.125-0.5 mg/day/PO
 - Lasix
 - 20 mg/day/PO
 - Spironolactone
 - 100 mg/day/PO
 - Imdur
 - 30 mg/day/PO

© 3M 2011. All rights reserved.

3M



Case Study #1

- Patient had to make a lifestyle change to improve his health. He required no surgery.
- Patient referred to Hospitals Congestive Heart program.
- He followed his physicians recommendations with CHF prevention guidelines he discussed with him.

Outcome:

Case Study #1 improves and follows up with his Primary Care Provider every 6 months and his Cardiologist yearly.



© 3M 2011. All rights reserved.

Polling Question #3

- Do you use disposable lead wires on your cardiac patients patients?
 - No, we do not use them
 - Currently Considering them
 - We have trailed them recently
 - Yes, we do



© 3M 2011. All rights reserved.

Pathophysiology of edema in acute pulmonary edema

Myocardial infarction
↓
sudden decrease in LV function
↓
sudden increase in left ventricular end diastolic pressure
↓
transmission back to left atrium and pulmonary arteries
↓
increased venous pressure
↓
increased capillary hydraulic pressure
↓
increased transcapillary gradient
↓
movement of fluid into interstitium
↓
edema

(c) 2006, Mark J. Samuels, M.D.



© 3M 2011. All rights reserved.

Sign and Symptoms of Pulmonary Edema

- Coughing
- Breathing
- Inability to speak



© 3M 2011. All rights reserved.

http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001195/radiation_000140_disease_symptoms

Treatment for Pulmonary Edema Medications

- Oxygen
- Diuretics
- Nitroglycerin (SL or GTT)
- Medicines to strengthen the heart muscle, control the heartbeat, or relieve pressure on the heart



© 3M 2011. All rights reserved.

http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001195/radiation_000140_disease_symptoms

Treatment for Pulmonary Edema Noninvasive

- CPAP with 10 cmH₂O
- If patient is unable to tolerate the CPAP & worsens we move to invasive methods



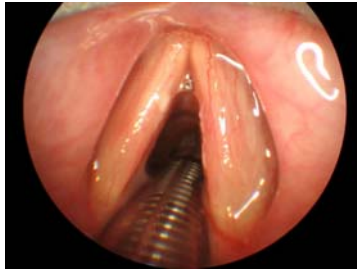
3M

© 3M 2011. All rights reserved.

<http://www.3m.com/articles/patient-care/many-benefits-cpap>

Treatment for Pulmonary Edema Invasive

- ET Tube placement



3M

© 3M 2011. All rights reserved.

<http://www.3m.com/articles/patient-care/many-benefits-cpap>

Polling Question #4

- How much are you involved in the decision on which ECG/EKG electrodes to use in your department?
 - I don't use electrodes
 - No decision involvement
 - Clinical Evaluations Only
 - Limited Decision Making Authority
 - Member of Value Analysis Team

3M

© 3M 2011. All rights reserved.

Case Study #2

- A 57 y/o Female arrives via ambulance to the ER
- Chief complaints
 - Sudden onset of difficulty breathing
 - Coughing up Pink Frothy Sputum
 - Nurse reports O2 sats of 82%
 - Emergent or Nonemergent patient?

© 3M 2011. All rights reserved.



Case Study #2

- History
 - MI 5 years ago with three vessel bypass
 - Hypertension
 - A-fib
 - Hyperlipidemia
- Medications
 - Pt has not been taking her medications as prescribed. States unable to afford them.

© 3M 2011. All rights reserved.



Case Study #2

- Physical exam
 - Lung Sounds
 - Little to no air movement noted- Very Diminished bilaterally.
 - Copious amount of pink frothy sputum coming from patients mouth
 - Abdominal
 - Firm and slightly distended
 - Upon palpation of the liver you noted her distended neck veins
 - Lower extremities
 - +2 pitting edema

© 3M 2011. All rights reserved.



Case Study #2

- Lab Tests
 - CBC
 - Chem 14
 - BNPRO
 - BUN
 - urinalysis
- X-ray
 - Chest X-ray
- Echocardiogram
- 12-Lead EKG



www.Zaazu.com



© 3M 2011. All rights reserved.

Case Study #2

- Lab Tests
 - CBC - Unremarkable
 - Chem 14 - Unremarkable
 - BNPRO - 3260
 - BUN - Unremarkable
 - Urinalysis - Unremarkable



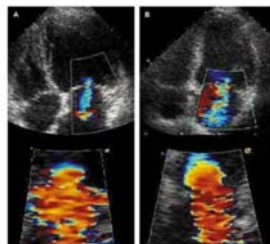
www.Zaazu.com



© 3M 2011. All rights reserved.

Case Study #2

- Chest X-ray
- Echocardiogram



<http://www.ncbi.nlm.nih.gov/pubmed/health/PUBMED/20051195/abstract>



© 3M 2011. All rights reserved.

- 12-lead EKG

Case Study #2

Case Study #2

Case Study #2

- Patient is in the ICU for one week. Extubated after 2 days in the ICU then transferred to a remote Telemetry floor to continue Cardiac Rehab and medication changes.

Outcome:

- Patient is discharged to home after 1 ½ weeks with new Heart Failure care plan in place.
- Patient was restarted on her medications. She remains compliant with her medications.
- Patient entered into Cardiac Rehab program and follows up with her Cardiologist every 3 months.



© 3M 2011. All rights reserved.



Questions?

Thank you for attending this 3M webinar presentation on Congestive Heart Failure and Pulmonary Edema!!

www.3M.com/IPEducation



References

- www.artic.com
- www.ayle-disease.blogspot.com
- www.Bloopz.tumblr.com
- www.BMC8711.blogspot.com
- www.bradleyrealityllcs.com
- www.ems12lead.com
- [www.farah0208@blogspot.com](mailto:farah0208@blogspot.com)
- www.fitsweb.uchc.edu
- www.heart.org
- www.jems.com
- Mark Sernak MD 2006
- www.ncbi.nlm.nih.gov/pubmedhealth
- www.neilbaum.wordpress.com
- www.scary-pictures.feedio.net



www.condenaststore.com



© 3M 2011. All rights reserved.
