The presentation will begin in a few moments….

CONTRAST ENHANCED IMAGING
HOW TO GET STARTED:
A Tale From A Facility Like Yours

For technical support, call
800-679-3646
CONTRAST ENHANCED IMAGING

HOW TO GET STARTED:
A Tale From A Facility Like Yours

Presented by: Laura S. Johnson, RDCS
Aurora Health Care
Housekeeping

– Phone lines have been muted
– Handouts are available by clicking the Resources button
– Technical support: 800-679-3646
– This call is being recorded
– CEU information:
  • Must be registered
  • Must login as yourself
  • 1.0 ASE CEU
KISS - keep it simple

- STANDING ORDERS
- PERSON READILY AVAILABLE TO START I.V. AND ADMINISTER CONTRAST
- IDENTIFY THE NEED AT THE BEGINNING OF THE STUDY
GETTING STARTED

• NECESSARY TOOLS
Policy No:

• Effective: Revised 01/2011
• Policy:
• Contrast Echocardiography

I. PURPOSE:

• To provide a consistent, safe and efficient process for administering of contrasts agent in echocardiography

II. POLICY:

• This policy is designed to provide specific guidelines for patient selection, safe care and administration based upon the guidelines for receiving contrast
WHAT SHOULD THE POLICY COVER?

• PROVIDES SPECIFIC GUIDELINES
  – PATIENT ORDER
  – PATIENT SELECTION OR EXCLUSION
  – PATIENT MONITORING
  – PERSONNEL RESPONSIBILITIES
  – DOSING AND ADMINISTRATION
  – DOCUMENTATION OF ADVERSE EVENTS
DO I NEED AN ORDER?

• AS DIRECTED BY PHYSICIAN
  – ORDERED CASE BY CASE

• STANDING ORDERS
  – PRECISE INDICATIONS AND CONTRAINDICATIONS
WHAT ARE THE INDICATIONS?

- ENDOCARDIAL BORDER DEFINITION
  - TWO OR MORE MYOCARDIAL SEGMENTS - NOT CLEARLY SEEN
ARE THERE MORE INDICATIONS?

- LVO - IDENTIFY OR EXCLUDE
  - THROMBUS
  - APICAL HYPERTROPHY
  - NON-COMPACTION
  - LV APICAL BALLOONING
  - LV ANEURYSM
  - LV PSEUDOANEURYSM
  - MYOCARDIAL RUPTURE
YOU MEAN THERE ARE MORE INDICATIONS?

- IDENTIFY AND CHARACTERIZE INTRACARDIAC MASSES
- ASSIST IN DIFFERENTIATION OF CARDIAC STRUCTURAL VARIENTS
- ENHANCE DOPPLER SIGNALS
IS IT SAFE FOR ALL MY PATIENTS?

• CONTRAINDICATIONS

– RIGHT TO LEFT, BIDIRECTIONAL OR TRANSIENT RIGHT TO LEFT CARDIAC SHUNT

– HYPERSENSITIVITY TO PERFLUTEN

– HYPERSENSITIVITY TO BLOOD, BLOOD PRODUCTS, OR ALBUMIN *OPTISON

– INTRA-ARTERIAL INJECTION
ARE THERE ANY MORE QUESTIONS FOR MY PATIENT?

- SURE!

  - ARE YOU PREGNANT OR COULD YOU BE PREGNANT?

  - ARE YOU NURSING?
DOCUMENTATION

• ADVERSE EFFECTS
  – ON REPORT
  – PATIENT CHART
  – MANUFACTURER NOTIFIED
SO I’M GOING TO USE CONTRAST, NOW WHAT?

• EXPLAIN TO THE PATIENT

• DISCUSSION
  – WHY
  – CONTRAINDICATIONS
  – WARNINGS

• VERBAL OR WRITTEN CONSENT
DO I NEED TO MONITOR MY PATIENT?

• YES!

• DO THESE PATIENTS STILL NEED TO BE MONITORED POST INJECTION?
  – PT’S WITH PULMONARY HYPERTENSION
  – UNSTABLE CARDIOPULMONARY CONDITIONS
    • NO!!! REVISED BLACK BOX WARNING
      – Deleted from the Box Warning
EMERGENCY MEDICAL EQUIPMENT

• FULLY EQUIPPED CODE CART

• TRAINED PERSONNEL
CONTRAST PREPARATION

• PREPARATION OF PRODUCT
  – CHECK EXPIRATION DATE
  – PREPARE AGENT IN ACCORDANCE WITH DIRECTION ON PACKAGE INSERT
    • Vial mixer *Definity
    • Invert vial, resuspend by rolling between palms of your hand *Optison
  – VENT VIALS
  – WITHDRAW PRODUCT SLOWLY
    • Do not inject air
IV INSERTION AND INJECTION
IS IT MINE? CAN’T BE!

IV PLACEMENT AND INJECTION

INDIVIDUAL INSTITUTION’S POLICY
LOCAL & STATE REQUIREMENTS
WHO STARTS YOUR I.V.S

• IDEAL SITUATION
  – PHYSICIANS
  – NURSES
  – I.V. TEAMS

• NOT SO IDEAL, BUT IT WORKS
  – SONOGRAPHERS
I.V. TRAINING

• COMPONENTS
  – KNOWLEDGE OF VENOUS ANATOMY
  – APPROPRIATE SITES
  – RISK TO PATIENTS
  – RISK TO THE I.V. STARTER
  – STERILE TECHNIQUE
  – INFECTION CONTROL
  – SAFETY PRECAUTIONS
I.V. TRAINING, YES THERE IS MORE!!!!!!

- CONFIRMATION OF VENOUS ACCESS
  - HOW DO I KNOW I’M SUCCESSFUL

- DOCUMENTATIONS OF TRAINING
  - CERTIFICATIONS
  - DIRECT SUPERVISION
  - PERIODIC SKILL ASSESSMENTS
### IV Competency

10 successful required

<table>
<thead>
<tr>
<th>#</th>
<th>Successful</th>
<th>Unsuccessful</th>
<th>Preceptor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GREAT! MY PATIENT ALREADY HAS AN I.V. IN PLACE!

- YOU’RE NOT OUT OF THE WOODS YET
  - KNOWLEDGE OF CATHETER TYPE
  - PATENCY
  - KNOWLEDGE OF MEDICATION BEING INFUSED

- CONSULT PATIENT’S NURSE
OK, SO WHAT IV SUPPLIES DO I NEED?

- GLOVES
- TOURNIQUET
- ALCOHOL PREP
- 2 x 2’S GAUZE
- 18 - 20g IV CATHETER
- INTERLINK INJECTION SITE
- TEGADERM FILM
- 10cc PREFILLED SALINE SYRINGE
- BLUNT PLASTIC CANNULA
- TAPE
DO I NEED ANYTHING ELSE?

• REFRIGERATOR
• VIAL MIXER *depending on product
• VENT SPIKE OR DISPENSING PEN
• STERILE 18 GAUGE NEEDLE FOR VENTING
CONTRAST DOSING AND ADMINISTRATION

• DOSING
  – IV BOLUS
  – DILUTED IV BOLUS
  – CONTINUOUS INFUSION
CONTRAST DOSING AND ADMINISTRATION

- **Bolus**
  - Administering 0.3 to 0.5 mL
  - Followed by a slow saline flush (1 to 10 mL)

- **Dilution method**
  - Vial of contrast diluted with saline in a 10 mL syringe
  - 0.5 to 1.5 mL is injected slowly into the IV line (up to 3 mL)
  - May or may not be followed by a saline flush
CONTRAST DOSING AND ADMINISTRATION

• Infusion
  - Inject the vial into 50 to 100 mL bag or saline syringe
  - Slowly infuse mixture
  - Or connect a 100 to 150 mL bag of saline to IV extension tubing, loading the proximal 12 inches of extension tubing with the contrast and infusing the saline through the contrast
I’m not sure if I should be doing this?!

Contrast Administration

Individual Institution’s Policies

Local and State Requirements
# COMPETENCY DOCUMENTATION

## Competency Title:
Contrast Competencies

## Competency Statement:
Demonstrates competencies in Preparation and Administration of Contrast

<table>
<thead>
<tr>
<th>Performance Objectives - measure knowledge, psychomotor skills, critical thinking, interpersonal skills.</th>
<th>Met</th>
<th>Not Met</th>
<th>Date/s</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows code to open supplies cabinet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collects all supplies needed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activates contrast</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draws up 8.5 cc Saline in a syringe or uses prefilled syringe if available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After activation, demonstrates venting of contrast vial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Improving health care through accreditation
# COMPETENCY DOCUMENTATION

<table>
<thead>
<tr>
<th>Task</th>
<th>Complete</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates pulling up contrast into Saline syringe and rolls product until blended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses alcohol pad at IV site prior to injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injects diluted contrast slowly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates the Cadence preset if available or demonstrates how to turn down MI before imaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquires images and Doppler as needed to complete the study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushes the IV site with Saline after finished with imaging or remove IV (outpatients)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watch and Observe patient for adverse reactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discards all syringes, vials and wrappers appropriately</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sonographer
Signature:
I THOUGHT CONTRAST WOULD ENHANCE MY IMAGE! WHAT AM I DOING WRONG?

- OPTIMIZE EQUIPMENT SETTINGS
- ADJUST CONTRAST ADMINISTRATION AS NEEDED
YOU MEAN I HAVE TO CHANGE MY MACHINE SETTINGS?

• HARMONIC IMAGING
• LOW MI
  – 0.2 -0.4 optimal
• TRANSMIT FOCUS
  – Far field location – MV level
• OPTIMIZE TGC’S AND GAINS
  – Minimize near field gains
• RECEIVER
  – Increase
• DYNAMIC RANGE
  – Narrow
MACHINE SETTINGS ARE OPTIMIZE BUT I’M STILL HAVING PROBLEMS?

• SWIRLING
• SHADOWING *ATTENUATION
• RIB / EXTRACARDIAC STRUCTURE
• BLOOMING
SWIRLING ARTIFACT

• MOST COMMON CAUSES
  – INJECTION ADMINISTERED TOO SLOW
  – MI TOO HIGH
  – IMPROPER FOCAL ZONE LOCATION
  – POOR APICAL FUNCTION
  – LOW EJECTION FRACTION
SWIRLING ARTIFACT RESOLVED
SHADOWING ARTIFACT

• CAUSE
  – CONTRAST ADMINISTERED TOO FAST
  – TOO MUCH CONTRAST

• RESULTING IN
  – HIGH LEVEL OF CONTRAST IN THE NEAR FIELD
  – SHADOWING IN THE FAR FIELD
Improving health care through accreditation
Improving health care through accreditation
RIB / EXTRACARDIAC ARTIFACT

• CAUSE
  – BEAM OBSTRUCTED BY THE RIB / EXTRACARDIAC STRUCTURE

• ADJUST IMAGE
BLOOMING ARTIFACT

• CAUSE
  – INJECTION IS TOO FAST
  – DOPPLER GAIN SETTINGS ARE TOO HIGH

• RESULTS IN
  – RETURNING DOPPLER SIGNALS ARE TOO STRONG
Improving health care through accreditation
• POLICY *LAB GUIDELINES
  – ORDERS
  – INDICATIONS/CONTRAINDICATIONS
  – CONTRAST PREPARATION
  – IV INSERTION
  – DOSING AND ADMINISTRATION
  – PATIENT MONITORING
  – DOCUMENTATION OF ADVERSE REACTIONS
• MACHINE SETTINGS
• ARTIFACTS *HOW TO AVOID
REFERENCES

• Journal of the American Society of Echo (May 2001)
  – Guidelines for the Cardiac Sonographer in the Performance of Contrast Echocardiography: Recommendations of the American Society of Echocardiography Council on Cardiac Sonography

• ASE guidelines (Nov. 2008)
  – American Society of Echocardiography Consensus Statement on the Clinical Applications of Ultrasonic Contrast Agents in Echocardiography

• Optison instruction for use

• Definity
  – www.definityimaging.com
Question & Answer Session
Thank you for joining us today!

NOTE: To receive ASE CEU credit for this webinar, you must complete the survey.