Aorta Alert & Code Aorta

Aortic Center Committee
Stony Brook Medicine

Developed by Aortic Center Committee 3/2016
Reviewed by KG/cm 3/2016
Objectives

The learner will be able to:

- Recognize the importance of early identification of signs and symptoms of an acute aortic dissection or ruptured aneurysm
- Identify the difference between Aorta Alert and Code Aorta
- Explain the role of each of the members of the healthcare team when a patient presents with a suspected or actual ruptured aneurysm, or symptomatic thoracic or abdominal dissection
- Identify at least two treatment strategies for the management of patients with acute aortic dissection or aneurysm
Why is Acute Aortic Aneurysm Syndromes a serious healthcare issue?

- Ruptured aortic aneurysms are one of the most fatal surgical emergencies with an overall mortality rate of 75%-90%
- Many patients are misdiagnosed because of the different anatomical locations of the rupture. Approximately 15,000 people die each year from a ruptured abdominal aortic aneurysm (AAA)
- This can lead to reduced blood flow to vital organs including the brain, spinal cord, intestine, kidneys and the lower extremities. Patients with acute aortic syndromes often require emergent surgical intervention
  - The classic triad of pain, hypotension and pulsatile abdominal mass due to rupture into the retroperitoneum is only seen in 25-50% of patients

**Goal:** Deliver the highest quality of care, thus reducing complications arising from this fatal condition
What is an Aorta Alert?

**Aorta ALERT** – An alert activated by or under the direction of an Emergency Medicine Physician for the purpose of rapidly assembling key team members for the prompt diagnosis of a patient with suspected impending aortic catastrophe

**Aortic Catastrophe**: suspected or actual ruptured aneurysm, or symptomatic thoracic or abdominal dissection

Note: If patients are transferred from outside institutions with a diagnosis of an type of aortic catastrophe then activate *Code Aorta* instead of Aorta Alert
Goals of Aorta Alert

- Minimize time from ED presentation to diagnosis and treatment

- Alert the *Aorta Alert Team* to confirm the diagnosis and initiate treatment
Criteria to Activate an Aorta Alert

includes but not limited to:

- Sudden onset of severe sharp or tearing back, chest, shoulder or abdominal pain
  - Abrupt in onset and/or severe in intensity
  - Ripping, tearing, sharp or stabbing quality
  - Unexplained Syncope
- Pulsatile Abdominal Mass
- Clinical Presentation of multiple simultaneous perfusion deficit or chest pain with other perfusion deficit: CNS, mesenteric (presents with acute abdominal pain), myocardial or limb ischemia
- Physical Exam Evidence of perfusion deficit: pulse deficit, upper extremity blood pressure differential (different pressures on right arm vs. left arm), focal neurological deficits in conjunction with pain (stroke-like symptoms with chest pain) and/or new murmur of aortic insufficiency end organ deficits
- Presence of high risk conditions: Marfan syndrome, connective tissue disease, family history of aortic disease, known aortic valve disease, recent aortic manipulation, known aortic aneurysm, prior Endovascular Aneurysm Repair (EVAR)
- Unexplained or refractory hypotension
- Point of Care Ultrasound showing sequelae of Aortic Catastrophe: aneurysmal dilation, periaortic hematoma, dissection flap, pericardial effusion, end artery occlusion
Notification Process

- Emergency Medicine physician *responsible* to activate the Aorta Alert
- **Dial # 0 - tell operator to activate the aorta alert**
- Tell operator to type in the pager: “AORTA ALERT”, Floor/Room # and call back number
- Members on pager notification list:
  - CT Technologist pager – who notifies Radiology Attending Physician for STAT read of imaging
  - Vascular Surgery Fellow- who notifies vascular/CT Attending Physician
  - General Surgery Resident
- *Pager notification only, note: NO announcement is made overhead*
Aorta Alert Response Process

- Initiate the Aorta Alert Power Plan
- ED staff transfers patient STAT to CT scan as soon as patient is stabilized
- Vascular/CT Attending Physician on call and ED Attending Physician maintain close contact regarding patient status.
- ED Attending Physician reviews images with Radiology Attending and confers with Vascular/CT Attending to determine plan
- *If operative management is indicated, Code Aorta is activated*
ED Guidelines for Aorta Alert

**High suspicion for Ruptured/Dissection or Symptomatic TAA or AAA**

- Sudden onset severe, chest, shoulder or abdominal pain
- Hemodynamic instability
- Family History of Aortic aneurysm
- History of Endovascular Aortic Repair with abdominal or chest pain
- Presence of pulsatile abdominal mass
- Current or past smoking history

**Call Aorta Alert and Initiate Aorta Alert Power Plan**

**Hemodynamically Stable ≥SBP 90 & Mentating**

- Aorta Alert Power Plan
  - **STAT CTA chest, abd., & pelvis**
    - If outside study suggests possible ascending Aortic or Rupture dissection order
    - “Cated Aorta Chest with CTA ABD/Pelvis” on Power Plan

- *Results of CTA → call Vascular Fellow or Surgeon Attending who determines:
  - Medical Management
  - Call “Code Aorta”
  - Negative Continue ER workup

**Hemodynamically Unstable ≤SBP 90 & Not Mentating**

- STAT Quick Bedside Ultrasound

- *Results of Ultrasound → call Vascular Fellow or Surgeon Attending who determines:
  - Aorta Alert Power Plan
    - **STAT CTA chest, abd., & pelvis**
      - If outside study suggests possible ascending Aortic or Rupture dissection order
      - “Cated Aorta Chest with CTA ABD/Pelvis” on Power Plan

- Call “Code Aorta”

- *Results of CTA → call Vascular Fellow or Surgeon Attending who determines:
  - Medical Management
  - Call “Code Aorta”
  - Negative Continue ER workup

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**Code Aorta Initial Management**

- **Anesthesiologist & Surgeon must communicate prior to bringing patient to the OR**
  - If initiating massive transfusion protocol: MUST call Blood Bank to request blood products AND OR team to deliver blood products from blood bank to OR
  - STAT: CBC, Chem B, PT/INR, PTT, Troponin, Lactic acid, T&$S, EKG
  - Permissive Hypotension Resuscitation: SBP 80-90
  - Verify uploaded Images to PACS and call 4-7453 stat outside image consult
  - Alert OR team and Sr. Vascular Fellow
  - Consent forms at bedside
  - Pain Control with Morphine or Fentanyl, Avoid Sedation medications-small doses, avoid hypotension

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**Transfer to OR**
What is Code Aorta?

- **Hospital wide protocol for a clinical response to an impending or actual ruptured/dissected thoracic or abdominal aortic aneurysm**
- **Adult protocol** to be initiated for patients 18 years of age or older
- This may occur while patient is:
  - En route from an outside facility (confirmed diagnosis on Cat scan with angiography) (CTA) or Ultrasound
  - In the Emergency Department: **Converted from a AORTA ALERT to Code Aorta**
    - Hospitalized as an inpatient with associated symptoms
- The Vascular Fellow/ In-house Surgical Chief is paged to respond to the patient’s bedside. The Vascular Surgery Fellow immediately contacts the Cardiothoracic and/or Vascular Surgery Attending Physician to discuss the case and respond to the bedside
- **Goal:** *Expedite the patient to the operating room for a resuscitative procedure*

**Code Aorta is only for surgical candidates who are going immediately to the operating under the direction of the vascular/CT Surgery Attending**
Once Code Aorta is called:

- Anesthesia coordinator begins preparations for accommodating the patient for a repair procedure.
- *Communication between anesthesiologist and Surgeon is crucial for management of patient prior to going into the operating room*
Members who can Activate a Code Aorta:

- Emergency Department Attending *AFTER* determination has been made by the Surgical Attending
- Vascular Fellow
- Vascular Attending
- Cardiothoracic Attending
Code Aorta Response Team

A designated team of qualified staff to provide emergency care to the adult patient who presents with either an *acute aortic dissection* or *symptomatic/ruptured aortic aneurysm*

- Vascular Surgery,
- Vascular Fellow
- Cardiothoracic & Anesthesia Attending Physicians
- General Surgery Resident
- Anesthesia Resident
- ADN
Transferring Guidelines for **Code Aorta/Back Up Code Aorta**
Ruptured/Dissection or Symptomatic Thoracic/Abdominal Aortic Aneurysm

**Accepted** Transfer of a Patient with a confirmed diagnosis on CTA or Ultrasound
Pt must be accepted by the Vascular/Cardiothoracic Division Attending
Notify Attending 30 minutes before arrival of patient

Imperative that transferring physician upload digital images immediately
Verify uploaded images to PACS and call 4-7453 stat outside image consult

Surgeon Attending determines
Code Activation by ED Attending AFTER determination by Vascular/CT Attending/Vascular Fellow

**Code Aorta Power Plan**
**STAT CTA chest, abdom., & pelvis**
If outside study suggests possible eroding Aorta or false dissection order
“Gated Aorta Chest with CTA ABD/Pelvis” on Power Plan

Results of CTA → call Vascular Fellow or Surgeon Attending who determines:

Medical Management → Call “Code Aorta”

**Code Aorta Initial Management**
Anesthesiologist & Surgeon must communicate prior to bringing patient to the OR

- **STAT**: CBC, Chem B, PT/INR, PTT, Troponin, Lactic acid, T & S, EKG
- Permissive Hypotension Resuscitation: SBP 80-90
- Initiate Code Aorta Power Plan
- **IF** initiating massive transfusion protocol: MUST call Blood Bank to request blood products AND OR team to deliver blood products from Blood Bank to OR
- Consent forms at bedside
- Pain Control with Morphine or Fentanyl, Avoid Sedation medications-small doses, avoid hypotension

Transfer to OR

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If no prompt response from Vascular Fellow or Vascular/CT Attending call “Back-up Code Aorta”
(Page all Vascular & CT Surgery Attending)

**CODE Aorta CTA protocol, OK to proceed without labs and with emergency premedication for mild or moderate allergy**
BACK UP CODE AORTA

- A secondary code utilized to ensure rapid assessment of a patient in the event that there is \emph{no immediate response} to an initial Code AORTA

- If a member of the surgical team (Vascular Fellow, Vascular or Cardiothoracic Surgery Attending) does \emph{not} call back the ED Attending \emph{within approximately 5 minutes}, a “BACK UP CODE AORTA” is called by the ED Attending. For a “BACK UP CODE AORTA”, all CT/Vascular Attending Physicians are paged for immediate response
Process for Patients En Route from an Outside Facility

- EMS calls directly to the CT/Vascular **Attending** according to the EMS transfer Protocols

- EM Attendings are not to accept Aortic Catastrophe Cases, but rather decision should go through Vascular or Cardiothoracic Attending

- Code activation by ED attending **after** determination by the CT/Vascular Attending/Fellow

- ED Physician or Vascular Attending responsible for uploading from Life Image to SBM PACS for review while pt enroute: MUST place order in Cerner for “CT-Body Outside Image Consult”. *Images will not be transferred until order is placed.*

- Initiate the Code Aorta Power Plan

- Initiate *Management Guidelines* and Communicate with Anesthesia

- Transfer patient to OR for repair expeditiously
### “Code Aorta” Power Plan

<table>
<thead>
<tr>
<th>Component</th>
<th>Order Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Orders</td>
<td>X1</td>
</tr>
<tr>
<td>Peripheral IV Insert</td>
<td>X1</td>
</tr>
<tr>
<td>Communication Order</td>
<td>May scan without IABP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permissive Hypotension Resuscitation Bolus Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider Note: The bolus orders below are for permissive hypotension resuscitation only. Considerations: For SBP &lt; 80 mmHg and/or not mentating, order 500 mL at a time and reassess patient.</td>
</tr>
<tr>
<td>Sodium Chloride 0.9% (0.9% NaCl Bolus)</td>
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</tr>
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<table>
<thead>
<tr>
<th>Laboratory Orders</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CBC Differential</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Chem B</td>
<td>STAT, Nurse Collect, X1, 0</td>
</tr>
<tr>
<td>Hepatic Panel</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Amylase Level</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Lipase</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Magnesium Level</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Phosphorous Level</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>HCG-Quant</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Prothrombin Time</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>aPTT</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Troponin-T</td>
<td>STAT, Nurse Collect, INT-QPM, 3, time(s)</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>STAT, Nurse Collect, X1</td>
</tr>
<tr>
<td>Urinalysis</td>
<td>STAT, X1</td>
</tr>
<tr>
<td>Urine Culture</td>
<td>Request Collect DR/Tx TPA, Routine, X1</td>
</tr>
<tr>
<td>Blood Type and Antibody Screen</td>
<td>STAT</td>
</tr>
<tr>
<td>Massive Transfusion Protocol (MTP)</td>
<td></td>
</tr>
<tr>
<td>Red Blood Cells Order Set</td>
<td></td>
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<tr>
<td>Fresh Frozen Plasma Order Set</td>
<td></td>
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<tr>
<td>Platelet Pheresis Order Set</td>
<td></td>
</tr>
<tr>
<td>Electrocardiogram-OP Standard (EKG-ED-Standard)</td>
<td></td>
</tr>
<tr>
<td>Chest X-ray-Portable</td>
<td>STAT, Reason for Exam: Other Reason for Exam, Code Aorta, 0</td>
</tr>
</tbody>
</table>

### “Aorta Alert” Power Plan

In Production

Same orders as “Code Aorta” Power plan EXCEPT

Does not include the Massive Transfusion Protocol

#### CT and Contrast Allergy Orders

Provider Note: The CT-Aorta orders can be found within the Contrast Allergy Subphases immediately below (NOTE)*

- CT Aorta Without Known Contrast Allergy Protocol(SUB)*
- CT Aorta with Mild or Unknown Contrast Allergy Protocol(SUB)*
- CT Aorta with Moderate Contrast Allergy Protocol(SUB)*
- CT Aorta with Severe Contrast Allergy Protocol(SUB)*

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**CT-Aorta without and with IV Contrast**

Order: 12/16/2015 15:27

12/16/2015 15:27, STAT, Reason for Exam: CODE Aorta/Aorta ALERT, USE TEVAR PROTOCOL, Evaluate for dissection, Pregnant: Not Applicable
Role of nurse if Aortic Catastrophe suspected in a hospitalized patients:

- Unit staff activates *Code Rapid Response* or *Code Blue* based on patients presenting symptoms and/or change in condition
- Gives SBAR report including patient’s history and presenting symptoms
- Response team notifies Vascular Fellow/CT/Vascular Attending who then activates Code Aorta
Key Points

- High suspicion, not confirmed: Activate the Aorta Alert

- Code Aorta activation is only for a confirmed diagnosis and if going to the operating room immediately

- ED attending can activate only after determination by the CT/Vascular Attending/Fellow

- ED can activate the BACK UP Code AORTA in the event of no response to the initial Code AORTA

- Usually willing to tolerate permissive hypotension (Systolic BP < 80 mmHg and/or not mentating) with conservative fluid resuscitation in cases of aortic catastrophe (see power plan)

- Must use the appropriate Power Plans: Aorta Alert or Code Aorta

- Inpatient: Staff determines Code Rapid Response or Code Blue based on patient’s status. Response team notifies Vascular Fellow/CT/Vascular Attending who then activates Code Aorta
KEY Points for Imaging Studies

• CTA protocol-OK to proceed without labs. Provide premedication if mild or moderate allergy to contrast (see Power Plan)

• Do not need to wait for premedication in event of contrast allergy

• If DOCUMENTED severe life threatening IV contrast allergy then order a non-contrast CT (see Power Plan)

• If outside studies suggest possible ascending aortic or root dissection then order: “Gated Aorta Chest with CTA abd./pelvis” (see Power Plan)
References


- Stony Brook Medicine Administrative Policy; PC0165 Code Aorta (Ruptured or Symptomatic Thoracic/Abdominal Aortic Aneurysm-Adult) 2016.


The classic triad of pain, hypotension and pulsatile abdominal mass due to rupture into the retroperitoneum is only seen in 25-50% of patients.

- A) True
- B) False

Who is responsible for initiating Aorta Alert?
- A) Triage RN
- B) Emergency Medicine Physician
- C) Vascular Fellow
- D) Cardiothoracic Attending

Which statement is true regarding the difference between an Aorta Alert and Code Aorta?
- A) No difference
- B) Aorta Alert is facilitate rapid diagnosis and management in undifferentiated ED patients and Code Aorta is for patients with a confirmed diagnosis and needs an immediate surgical intervention
- C) Aorta Alert is a notification by pager only and Code Aorta is announced overhead
- D) B and C are both true

When do you initiate a “BACK UP Code Aorta”?
- A) Patient diagnosed with a acute thoracic dissection
- B) Patient needs the massive transfusion protocol
- C) Patient does not need surgery
- D) CT/Vascular Attending and or Vascular Fellow did not respond when the Code Aorta was initiated.

What is the most appropriate Radiology workup of a patient with suspected Aortic Catastrophe and DOCUMENTED severe life threatening IV contrast allergy?
- A) Proceed immediately with CTA Chest, Abdomen and Pelvis following single dose of IV steroids since benefits of imaging outweigh risks.
- B) Proceed with NonContrast CT of Chest/Abdomen/Pelvis. May need to discuss need for performing contrast enhanced CTA which would require prophylactic intubation prior to scanning
- C) Contact Vascular attending prior initiating Aorta Alert or CODE Aorta Power plan to determine whether NonContrast CT versus CTA with contrast should be performed
- D) Perform MRI of Chest/Abdomen/Pelvis to avoid risk of life threatening allergy
- E) Contact On-call attending Radiologist to determine relative risk of performing a NonContrast MRI or CTA with contrast in the specific patient under question