

# Unnecessary AAA Screening Ultrasounds in Patients with Prior Imaging



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# DISCLOSURE

**Vivek Patel, MD**

**No Relevant Financial  
Relationship Reported**



# Purpose

The purpose of this study is to determine how many screening AAA ultrasounds could have been avoided by review of prior cross sectional imaging.

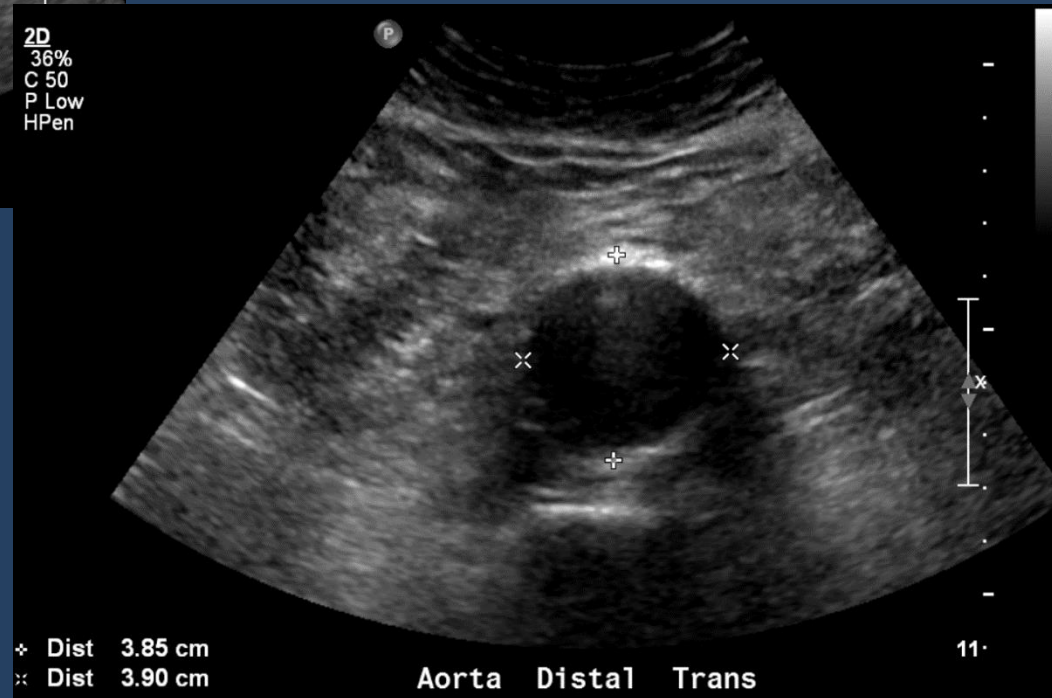
# AAA Definition

- Pressure from the aortic blood flow causes ballooning or bulging of a weakened aortic wall.
- An abdominal aorta larger than 3.0 cm in largest diameter is considered aneurysmal.

# Ultrasound Screening

- Fast, accessible, noninvasive and relatively cost effective
- Reproducible
- 94-100% sensitivity
- 98-100% specificity
- Limitations
  - Body habitus
  - Bowel gas
  - Operator dependent

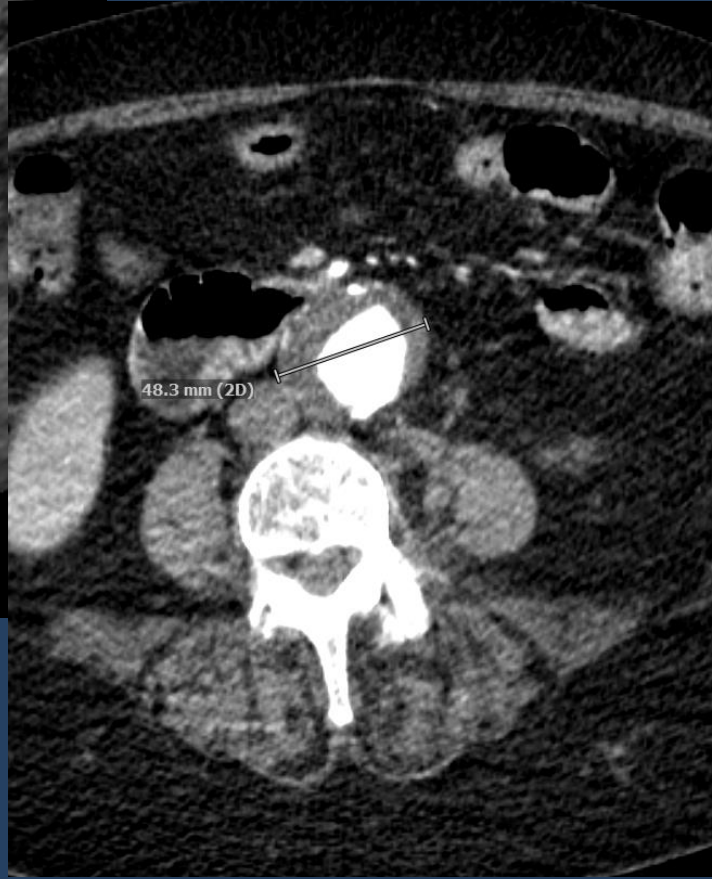
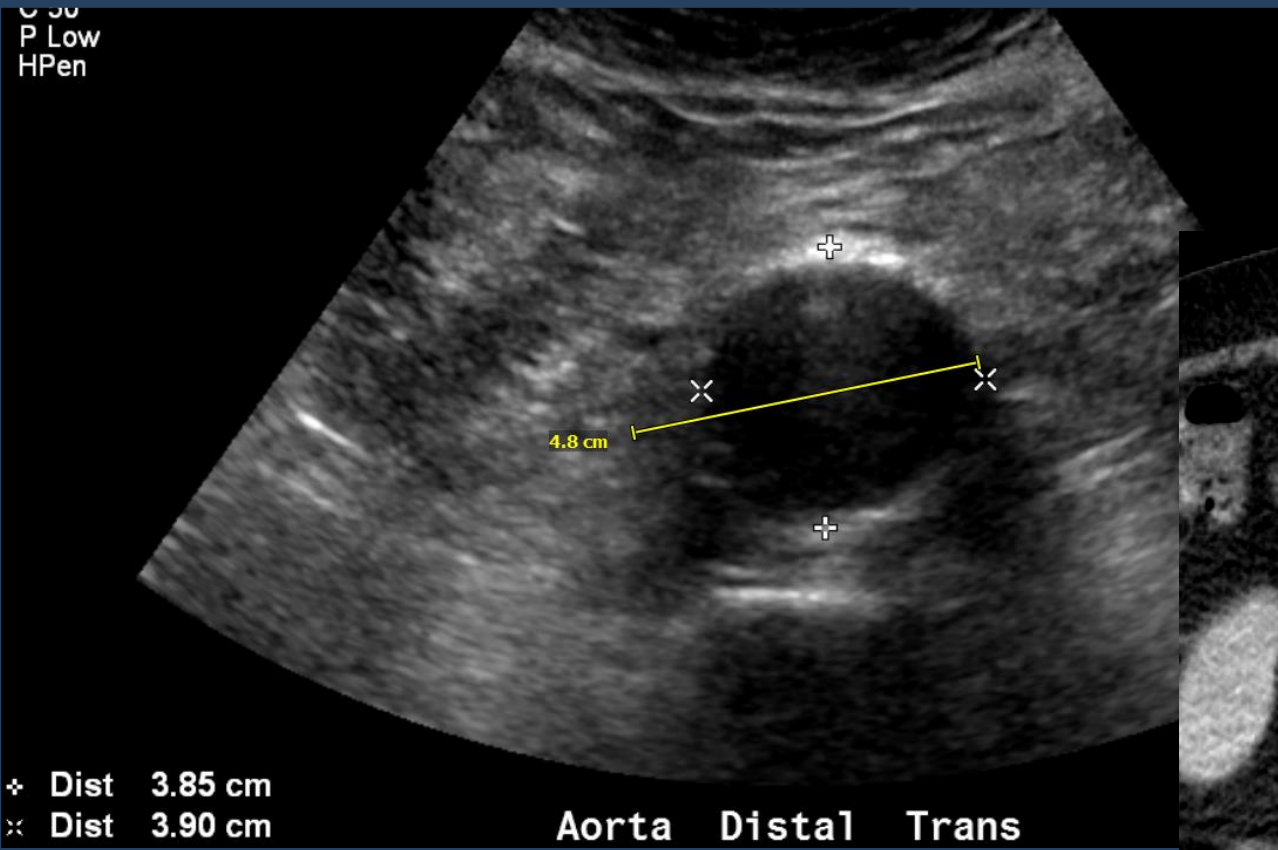
# AAA Ultrasound Imaging



CT

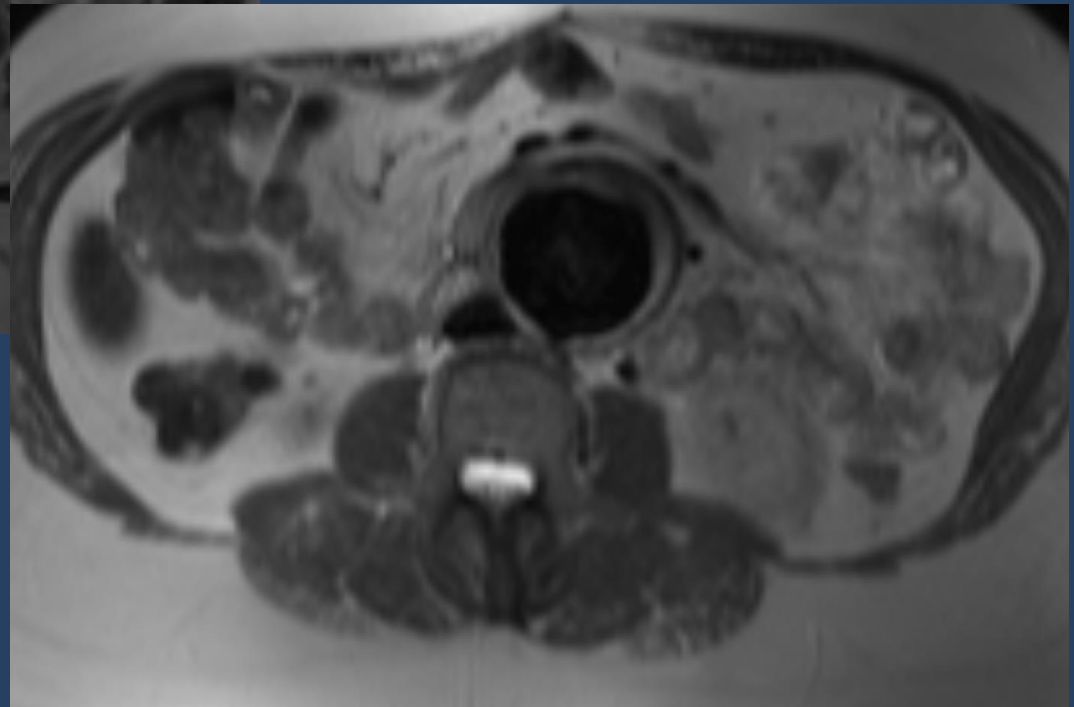
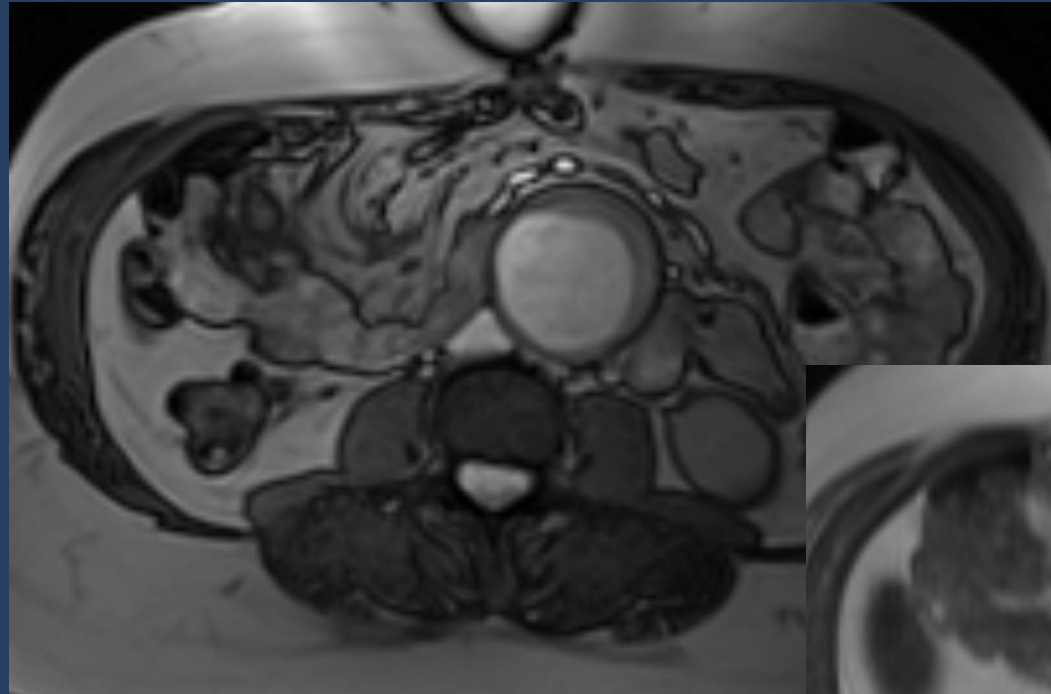


# Comparison

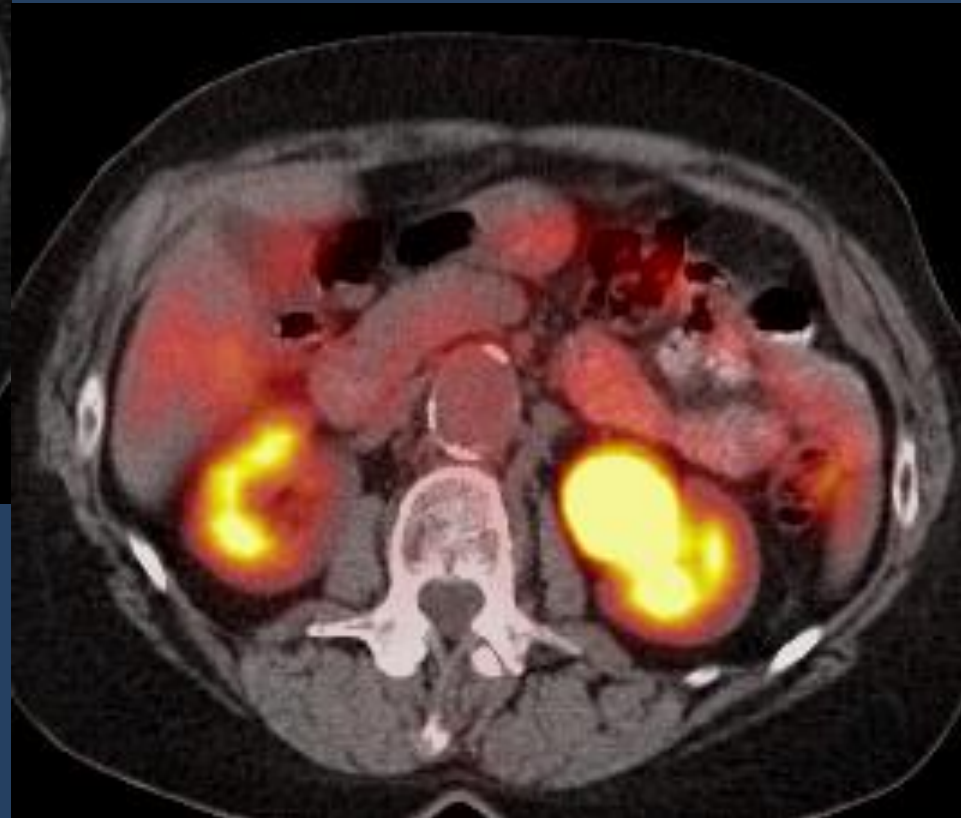




# MRI



# PET/CT



# USPSTF AAA Screening Recommendations

Population	Recommendation	Grade (What's This?)
Men Ages 65 to 75 Years who Have Ever Smoked	The USPSTF recommends one-time screening for abdominal aortic aneurysm (AAA) with ultrasonography in men ages 65 to 75 years who have ever smoked.	<b>B</b>
Men Ages 65 to 75 Years who Have Never Smoked	The USPSTF recommends that clinicians selectively offer screening for AAA in men ages 65 to 75 years who have never smoked rather than routinely screening all men in this group.	<b>C</b>
Women Ages 65 to 75 Years who Have Ever Smoked	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for AAA in women ages 65 to 75 years who have ever smoked.	<b>I</b>
Women Who Have Never Smoked	The USPSTF recommends against routine screening for AAA in women who have never smoked.	<b>D</b>

Guirguis-Blake, J. M., Beil, T. L., Sun, X., Senger, C. A., & Whitlock, E. P. (2014). Primary Care Screening for Abdominal Aortic Aneurysm: A Systematic Evidence Review for the U.S. Preventative Services Task Force.

# Other AAA Screening Recommendations

- Society of Vascular Surgery (2018)

We recommend a one-time ultrasound screening for AAAs in men or women 65 to 75 years of age with a history of tobacco use.

Level of recommendation 1 (Strong)

Quality of evidence A (High)

We suggest ultrasound screening for AAA in first-degree relatives of patients who present with an AAA. Screening should be performed in first-degree relatives who are between 65 and 75 years of age or in those older than 75 years and in good health.

Level of recommendation 2 (Weak)

Quality of evidence C (Low)

We suggest a one-time ultrasound screening for AAAs in men or women older than 75 years with a history of tobacco use and in otherwise good health who have not previously received a screening ultrasound.

Level of recommendation 2 (Weak)

Quality of evidence C (Low)

If initial ultrasound screening identified an aortic diameter >2.5 cm but <3 cm, we suggest rescreening after 10 years.

Level of recommendation 2 (Weak)

Quality of evidence C (Low)

Chaikof, E. L., Dalman, R. L., Eskandari, M. K., Jackson, B. M., Lee, W. A., Mansour, M. A., ... & Oderich, G. S. (2018). The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *Journal of vascular surgery*, 67(1), 2-77.

# Other AAA Screening Recommendations

- American College of Cardiology/American Heart Association (2005)

Hirsch, A. T., Haskal, Z. J., Hertzler, N. R., Bakal, C. W., Creager, M. A., Halperin, J. L., ... & Rosenfield, K. A. (2006). ACC/AHA 2005 practice guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): A collaborative report from the American Association for Vascular Surgery/Society for Vascular Surgery,\* Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines (Writing Committee to Develop Guidelines for the ... *circulation*, 113(11), e463-e654.

## 5.2.4.6. Screening High-Risk Populations

### RECOMMENDATIONS

#### Class I

**Men 60 years of age or older who are either the siblings or offspring of patients with AAAs should undergo physical examination and ultrasound screening for detection of aortic aneurysms. (*Level of Evidence: B*)**

#### Class IIa

**Men who are 65 to 75 years of age who have ever smoked should undergo a physical examination and 1-time ultrasound screening for detection of AAAs. (*Level of Evidence: B*)**

# Methods

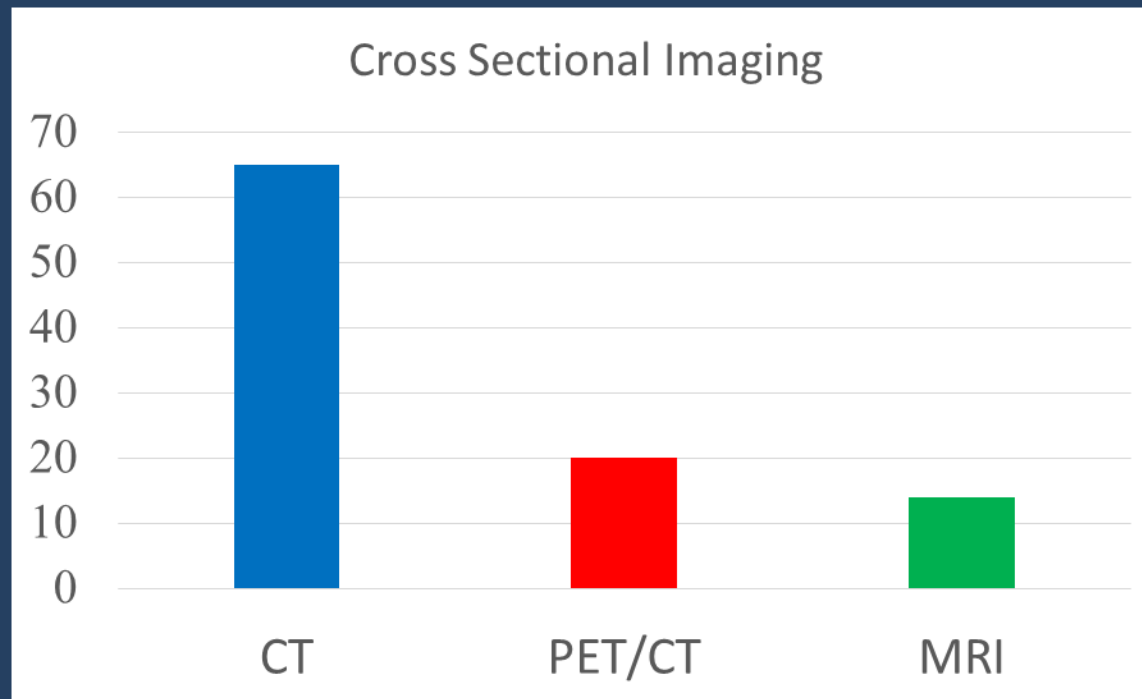
- A retrospective review was conducted looking for male patients aged 65 years or older who received an AAA screening ultrasound
- 10 year period (2008 – 2018) at a multisite institution.
- Aortic ultrasounds for other reasons including pain, follow up, or pulsatile mass were excluded.
- Within this subset, patients with prior cross sectional imaging (CSI) within 5 years of the ultrasound were identified.
- To be included, the prior CSI must include imaging of the entire abdominal aorta (CT, MR, PET/CT).

# Results

- 1839 ultrasounds were performed for AAA screening in men over the age of 65 for the 10 year period.
- 99 (5.4%) were found to have undergone CSI that included the abdominal aorta within 5 years prior to the ultrasound.
- The average age of the 99 patients was approximately 70 years old.
- The prior CSI was performed on average 582 days before the ultrasound.

# Results

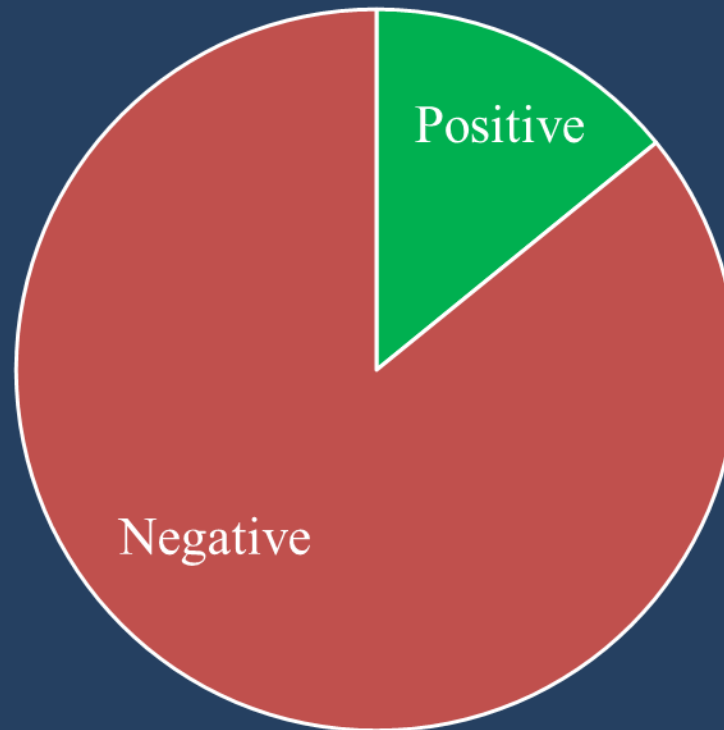
- The CSI prior exams included 65 CT's, 20 PET/CT's, and 14 MRI's.





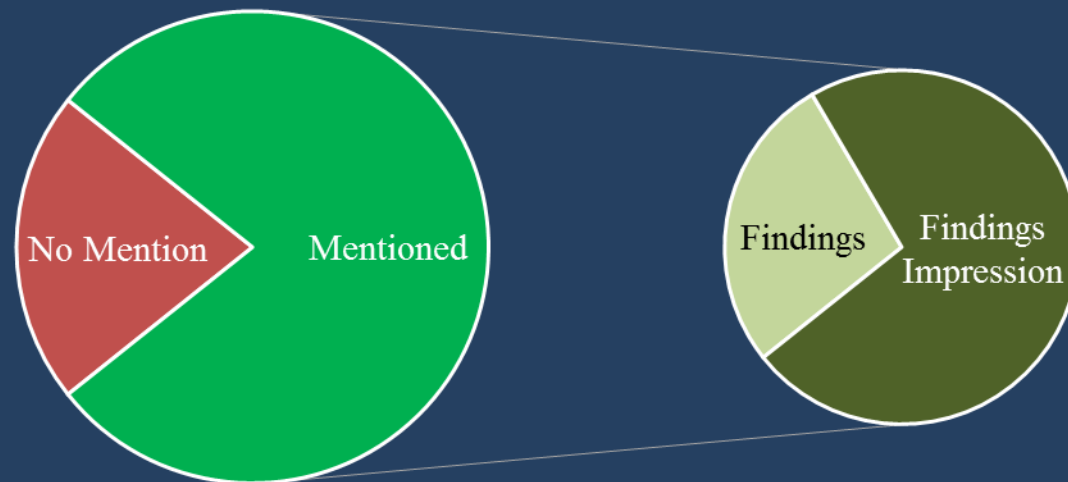
# Results

- Of the 99 patients, 14 cases (14%) were positive for an AAA.



# Results

- All 14 CSI (100%) that preceded those cases demonstrated the AAA.
- 11 of 14 (79%) of the CSI reports mentioned the AAA in the findings and 8 of 14 (57%) mentioned the AAA in the impression.



# Discussion

- At this institution, over 5% of AAA screening ultrasounds obtained over a 10 year period were performed unnecessarily.
- There was low reporting of AAA's within the impression of the prior CSI (57%)

# Limitations

- Small sample size
- Outside prior studies not accounted for
- Retrospective search errors
- Radiologist reporting techniques

# Conclusion

- Radiologists should improve AAA reporting.
- Referring physicians and schedulers/technologists should be more diligent in inquiring about past imaging.

# References

1. Guirguis-Blake, J. M., Beil, T. L., Sun, X., Senger, C. A., & Whitlock, E. P. (2014). Primary Care Screening for Abdominal Aortic Aneurysm: A Systematic Evidence Review for the U.S. Preventative Services Task Force.
2. Chaikof, E. L., Dalman, R. L., Eskandari, M. K., Jackson, B. M., Lee, W. A., Mansour, M. A., ... & Oderich, G. S. (2018). The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *Journal of vascular surgery*, *67*(1), 2-77.
3. Hirsch, A. T., Haskal, Z. J., Hertzner, N. R., Bakal, C. W., Creager, M. A., Halperin, J. L., ... & Rosenfield, K. A. (2006). ACC/AHA 2005 practice guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): A collaborative report from the american association for vascular surgery/society for vascular surgery,\* Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines (Writing Committee to Develop Guidelines for the ... *circulation*, *113*(11), e463-e654.

# Questions

