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### **Title**

Sex Differences in Evaluation for Acute Pulmonary Embolism Among Emergency Department Patients Aged 18-49

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The data associated with this publication are not available for this reason: N/A



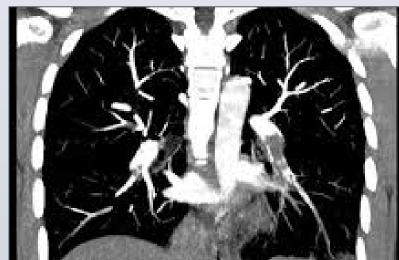
# Sex Differences in Evaluation for Acute Pulmonary Embolism

# Among Emergency Department Patients Aged 18-49 Angela F. Jarman, MD, MPH<sup>1</sup>, Kajol Singh, BS<sup>2</sup>

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# **Background**

Acute pulmonary embolism (PE) occurs with approximately equal incidence in non-pregnant adult women and men. Although sex is not a risk factor in any validated clinical decision tool for predicting risk of PE, limited data suggest that women may be tested more frequently. We hypothesized that women are tested for PE in the ED at different rates than men.



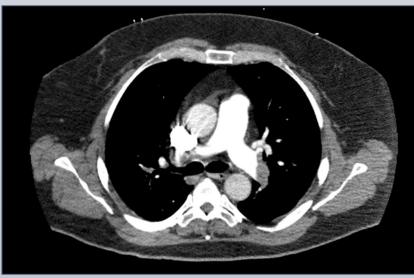
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# **Objectives**

- compare PE incidence amongst men and women evaluated for PE
- analyze the rate at which men and women receive CT angiograms for the acute workup of PE
- evaluate the differences between men and women receiving guideline consistent care

## Methods

We performed a retrospective chart review of patients between ages 18-49 who presented to a tertiary hospital ED during calendar years 2016-2018 and had a chief complaint or discharge diagnosis of pulmonary embolism, chest pain, dyspnea, hemoptysis, or syncope; patients with traumatic etiologies were excluded. This cohort was selected due to the greater potential harms of unnecessary testing. We extracted data elements from the electronic medical record including chief complaint, diagnosis, and testing in the ED. Multiple imputation by chained equations was used to account for missingness of key data elements. Descriptive statistics were performed for this cohort, by biological sex, age, and chief complaint. Chi square was used to compare rates of testing between women and men.



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### Results

We studied 5,789 encounters, 2808 men and 2981 women. The overall incidence of PE in this cohort was 1.4%, 1.6% for men and 1.2% for women.

Women were more likely than men to undergo D-dimer testing (385/2981, 12.9% vs 193/2808, 6.9%, p<0.01). Women were also more likely than men to receive imaging studies, (181/2981, 6.1% vs 130/2808, 4.6%, p<0.02). Of the included chief complaints, patients presenting with hemoptysis were most likely to have imaging performed (5/30, 16.7% of women and 3/31, 9.7% of men).

	Male									
	Patients	Dimer		lm	Imaging		Dx_PE			
Age 18-35	N	N	%	N %	<b>6</b>	N S	%			
Chest pain	531	45	8.5%	24	4.5%	5	0.9%			
Dyspnea	224	15	6.7%	12	5.4%	4	1.8%			
Syncope	118	4	3.4%	2	1.7%	0	0.0%			
Hemoptysis	20	3	15.0%	3	15.0%	0	0.0%			
Multiple of										
above	39	2	5.1%	2	5.1%	0	0.0%			
Other	375	15	4.0%	11	2.9%	6	1.6%			
Total	1307	84	6.4%	54	4.1%	15	1.1%			
Age 36-49										
Chest pain	659	57	8.6%	23	3.5%	6	0.9%			
Dyspnea	266	17	6.4%	29	10.9%	5	1.9%			
Syncope	120	3	2.5%	-	0.0%	1	0.8%			
Hemoptysis	11	. 1	9.1%	-	0.0%	0	0.0%			
Multiple of										
above	63	8	12.7%	3	4.8%	1	1.6%			
Other	382	23	6.0%	21	5.5%	17	4.5%			
Total	1501	109	7.3%	76	5.1%	30	2.0%			
	Female									

	remaie									
						Diagnosed				
	Patients	Dimer		Imaging		PE				
Age 18-35	N	N	%	N '	%	N	%			
Chest pain	581	97	16.7%	28	4.8%	4	0.7%			
Dyspnea	294	33	11.2%	16	5.4%	4	1.4%			
Syncope	26	11	42.3%	-	0.0%	0	0.0%			
Hemoptysis	19	0	0.0%	1	5.3%	0	0.0%			
Multiple of										
above	77	22	28.6%	8	10.4%	1	1.3%			
Other	399	33	8.3%	12	3.0%	7	1.8%			
Total	1396	196	14.0%	65	4.7%	16	1.1%			
Age 36-49										
Chest pain	668	110	16.5%	39	5.8%	4	0.6%			
Dyspnea	301	30	10.0%	31	10.3%	5	1.7%			
Syncope	150	10	6.7%	5	3.3%	1	0.7%			
Hemoptysis	11	0	0.0%	4	36.4%	2	18.2%			
Multiple of										
above	78	10	12.8%	9	11.5%	2	2.6%			
Other	377	29	7.7%	28	7.4%	7	1.9%			
Total	1585	189	11.9%	116	7.3%	21	1.3%			

## Conclusions

Sex and gender based differences in the presentation, workup, and diagnosis of disease have been found to be clinically significant in a variety of disease processes. In this cohort of ED patients for whom PE was likely a diagnostic consideration, women were more likely to undergo testing despite equal disease incidence. This is potentially harmful given the risks associated with overtesting (eg ionizing radiation). Clinicians should consider these differences and evidence based guidelines when evaluating patients for possible PE.

# References

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