



ACC Latin America  
Conference 2017



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**GLOBAL EXPERTS, LOCAL LEARNING**



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# Management of Anticoagulation and Valvular Heart Disease in Pregnancy

**Presenters:**

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**The University of Oklahoma**



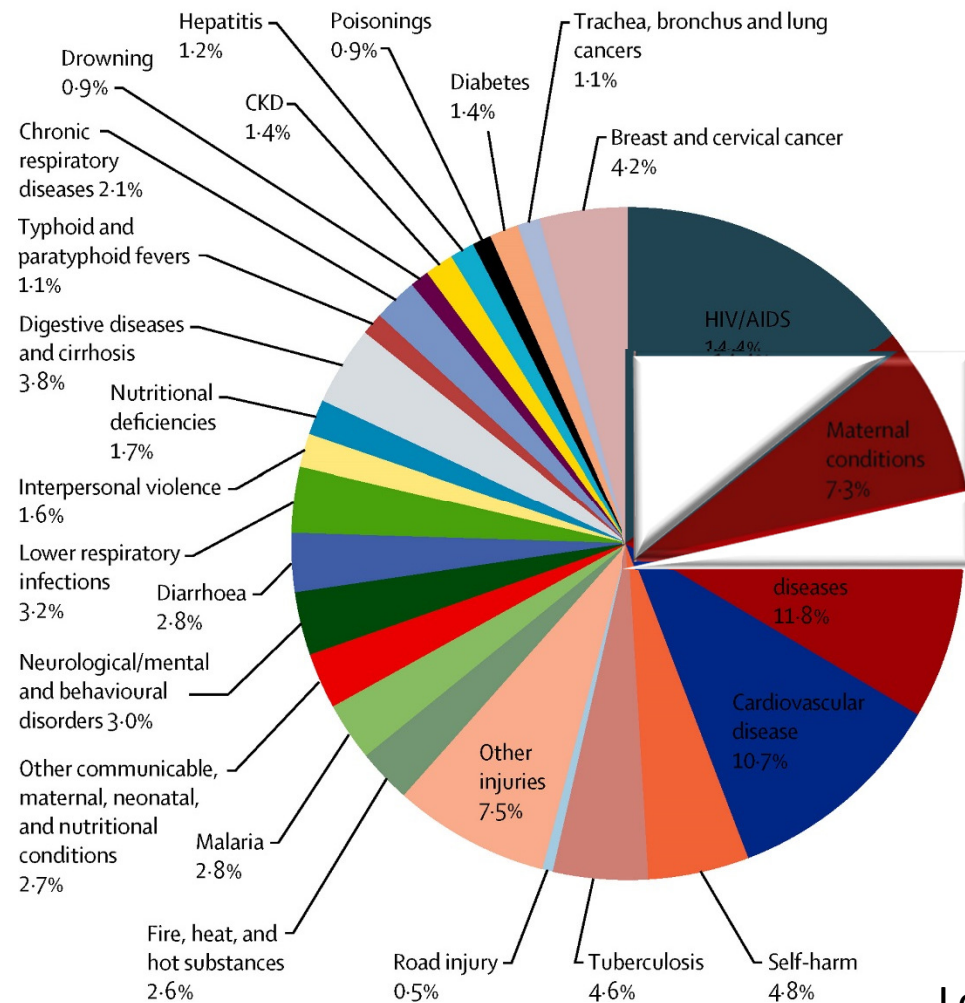
# No Disclosures



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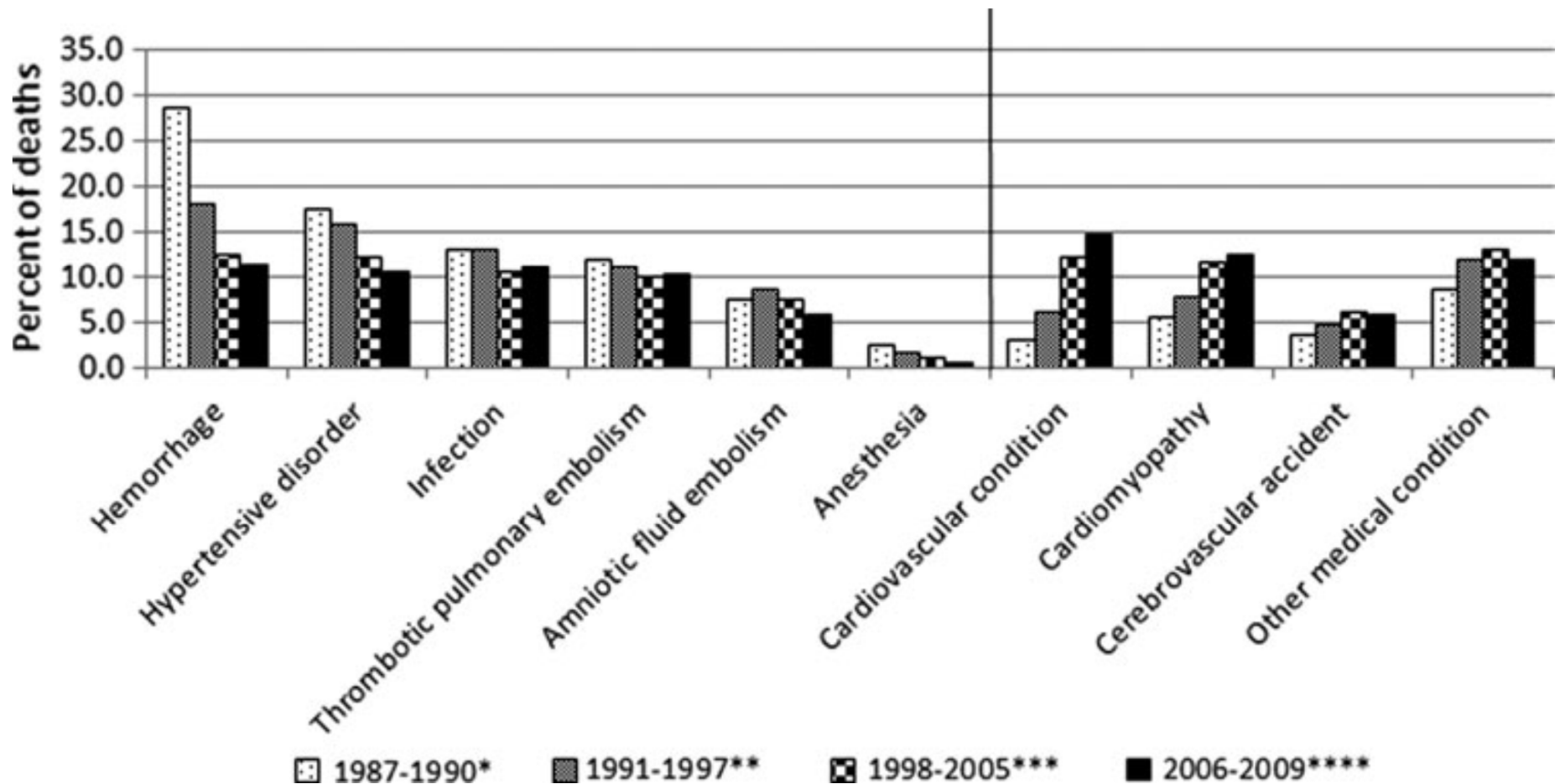


# Global Deaths in Women Ages 15-49 Years (2010)



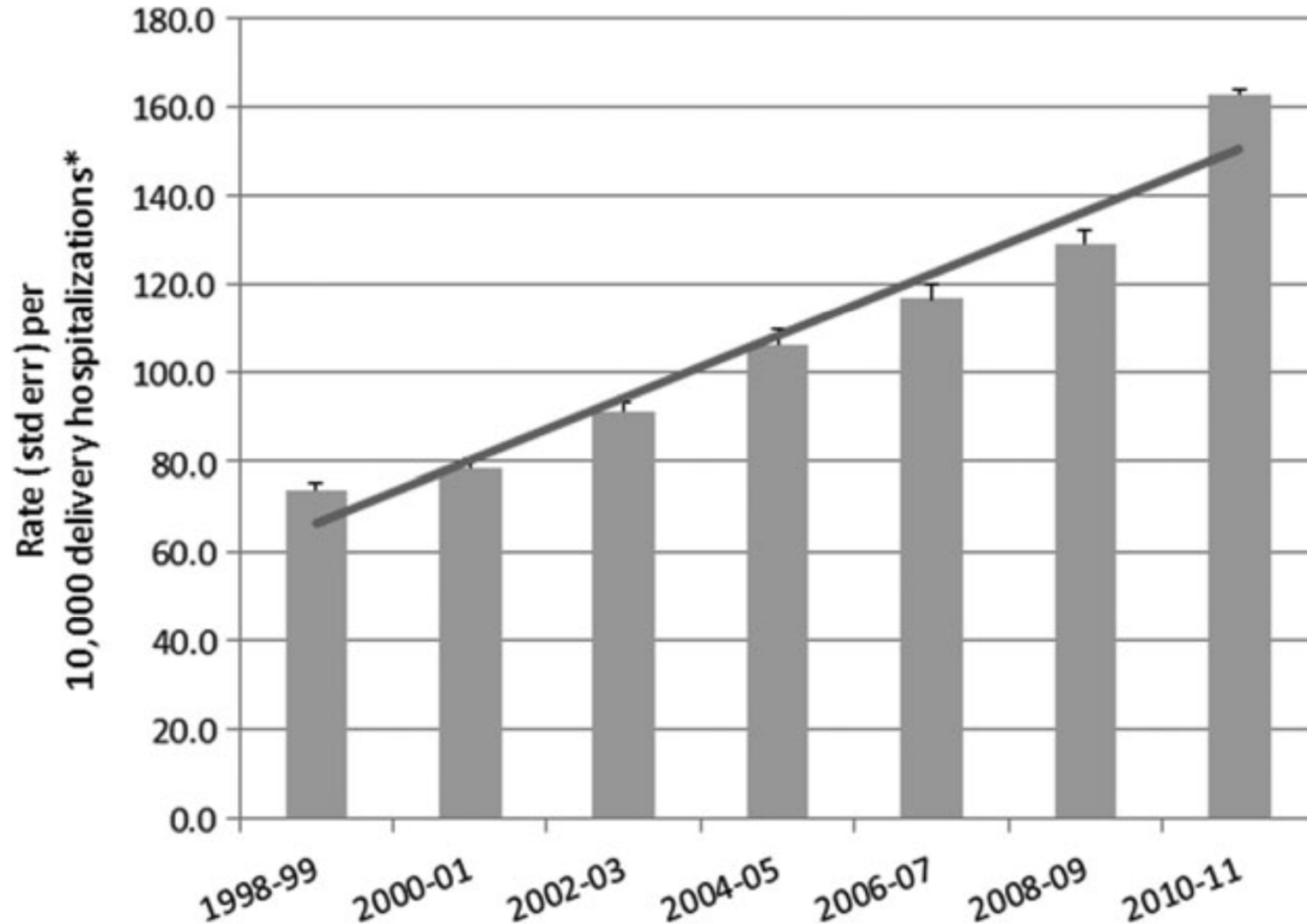
Lozano et al. Lancet.  
2013;380(9859):2095-128.

## Etiology of Pregnancy Related Mortality in the United States



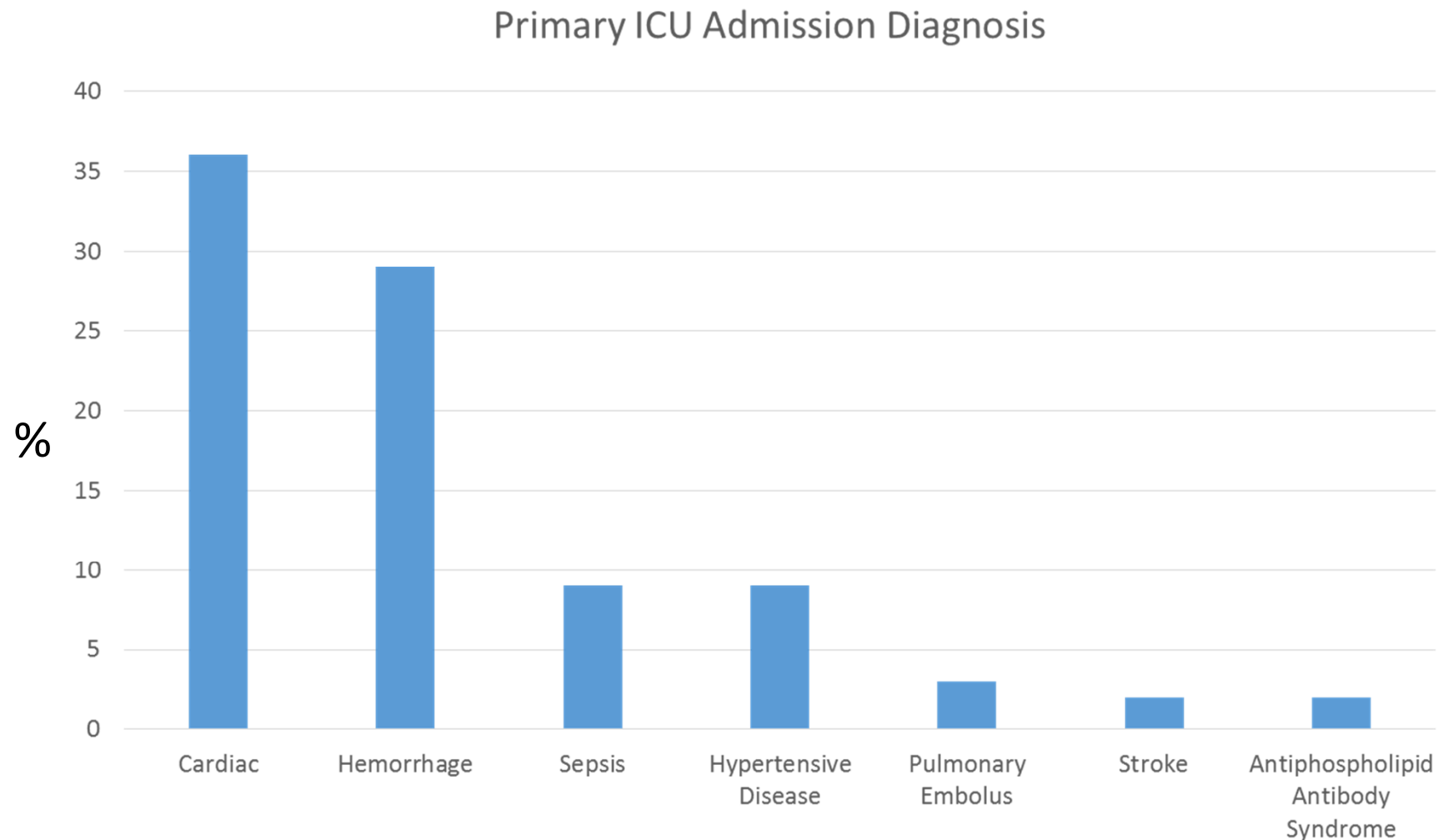
Creanga AA, Berg CJ, Ko JY, et al. Maternal mortality and morbidity in the United States: where are we now? *Journal of Women's Health*. 2014;23(1):3-9.

## Severe Maternal Morbidity During Hospitalization for Delivery



Creanga AA, Berg CJ, Ko JY, et al. Maternal mortality and morbidity in the United States: where are we now? *Journal of Women's Health*. 2014;23(1):3-9.

# Near Miss Maternal Mortality



Small MJ, James AH, Kershaw T, et al. Near-miss maternal mortality: cardiac dysfunction as the principal cause of obstetric intensive care unit admissions. *Obstet Gynecol.* 2012;119(2, Part 1):250-5.

# ZAHARA Predictors of Risk of Cardiac Complication During Pregnancy

History of arrhythmia	1.50 points
Cardiac medication usage pre-pregnancy	1.50 points
Baseline NYHA class $\geq$ II	0.75 points
Left heart obstruction (aortic valve area $< 1.0$ cm <sup>2</sup> , peak left ventricular outflow gradient $> 50$ mmHg)	2.50 points
Systemic AV valve regurgitation (moderate/severe)	0.75 points
Pulmonary AV valve regurgitation (moderate/severe)	0.75 points
Mechanical valve prosthesis	4.25 points
Repaired or unrepaired cyanotic heart disease	1.00 points

Risk Score

Cardiac Complications in % of Total Number of Pregnancies

0 – 0.50	2.9
0.51 – 1.50	7.5
1.51 – 2.50	17.5
2.51 – 3.50	43.1
$>3.51$	70.0

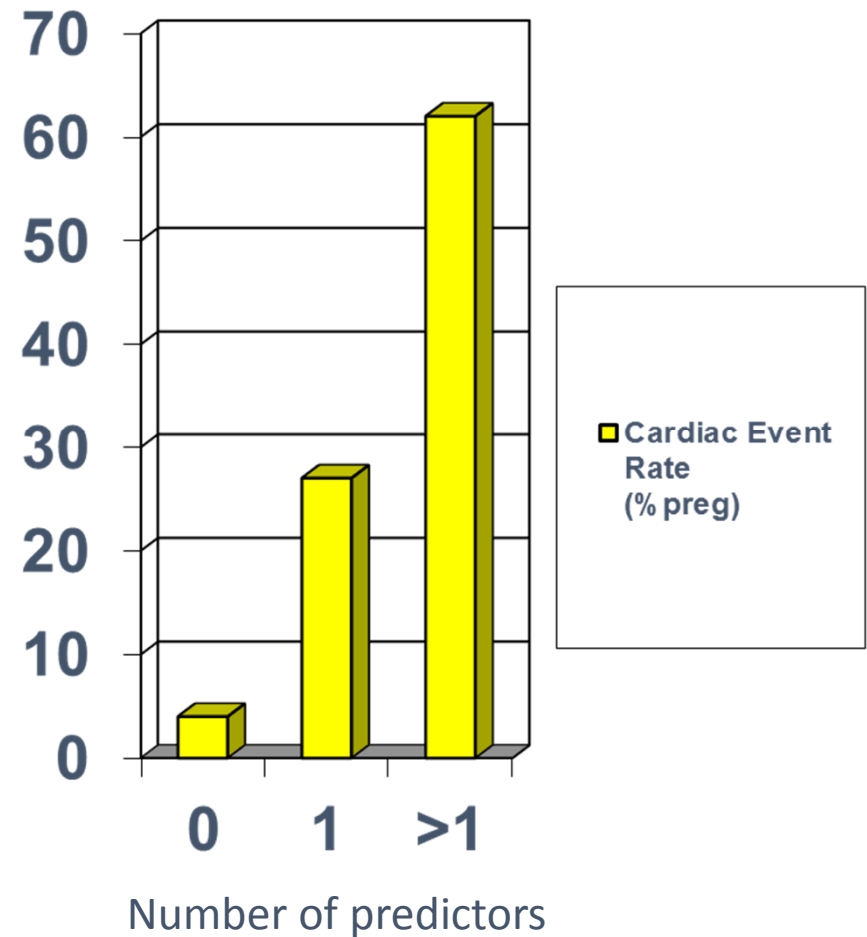
Drenthen W, Boersma E, Balci A, et al.  
Predictors of pregnancy complications in women with congenital heart disease.  
Eur Heart J. 2010;31(17):2124-32.



# Risk Stratification

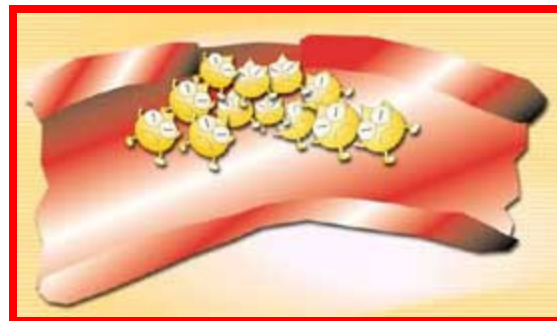
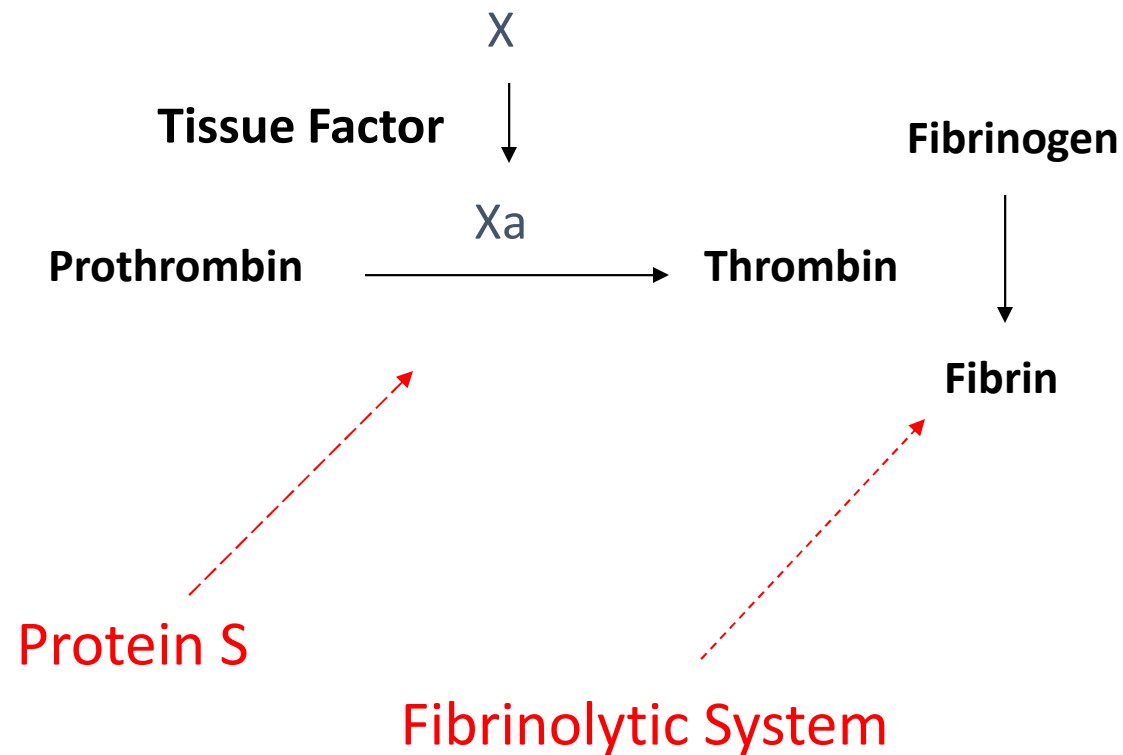
- Predictors

1. Prior Cardiac Event or arrhythmia
2. Baseline NYHA class > II or cyanosis
3. Left Heart Obstruction
4. Reduced LV EF

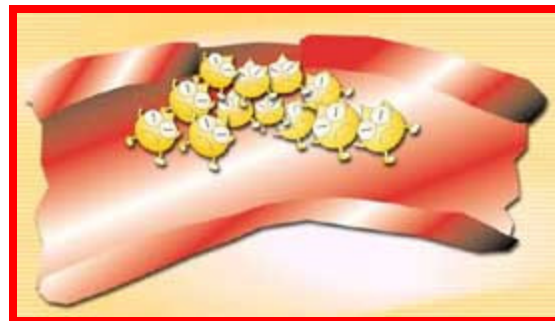
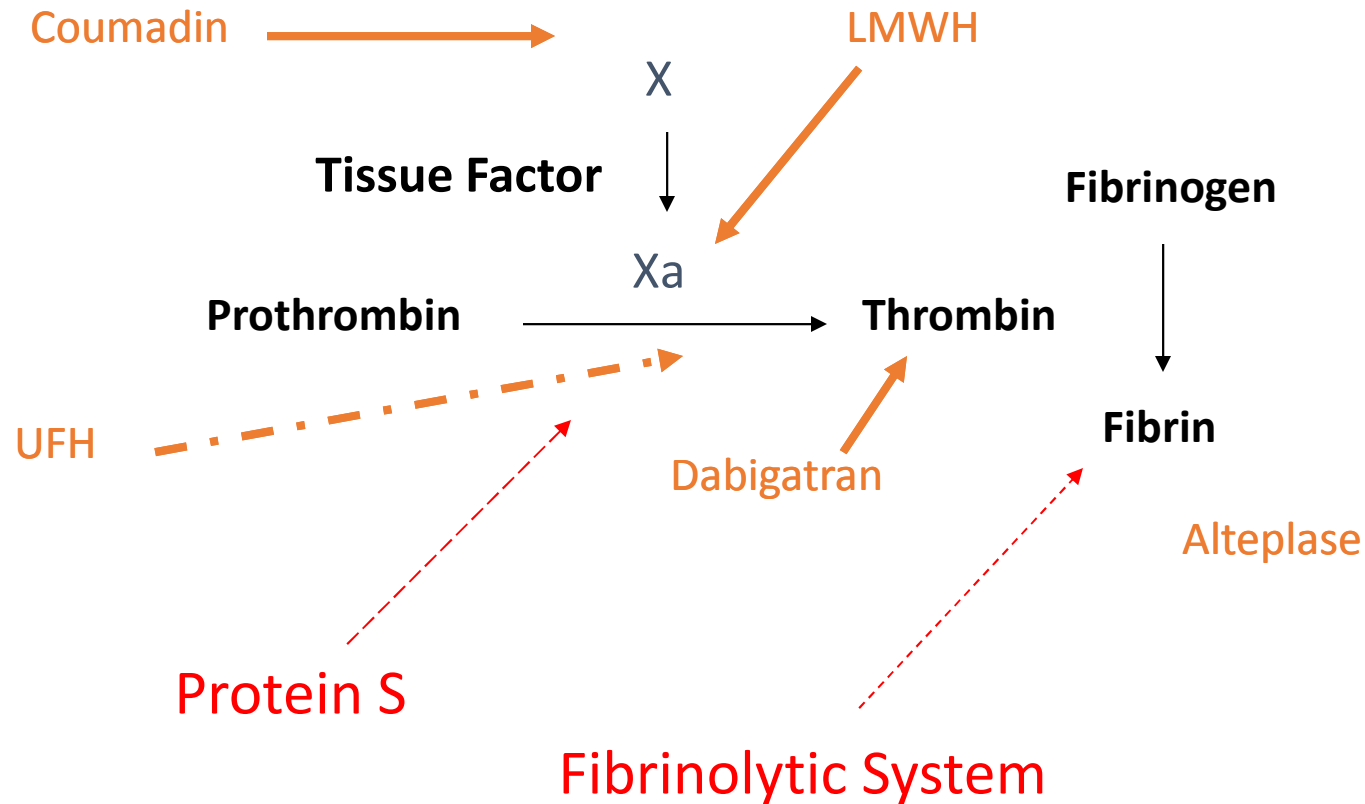


Siu SC et al. Prospective Multicenter Study of Pregnancy Outcomes in Women with Heart Disease. Circ 2001; 104:515-521.

# Pregnancy is a Pro-thrombotic State



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# Hemodynamic Changes

$$\text{Cardiac Output} = \text{Stroke Volume} \times \text{Heart Rate}$$

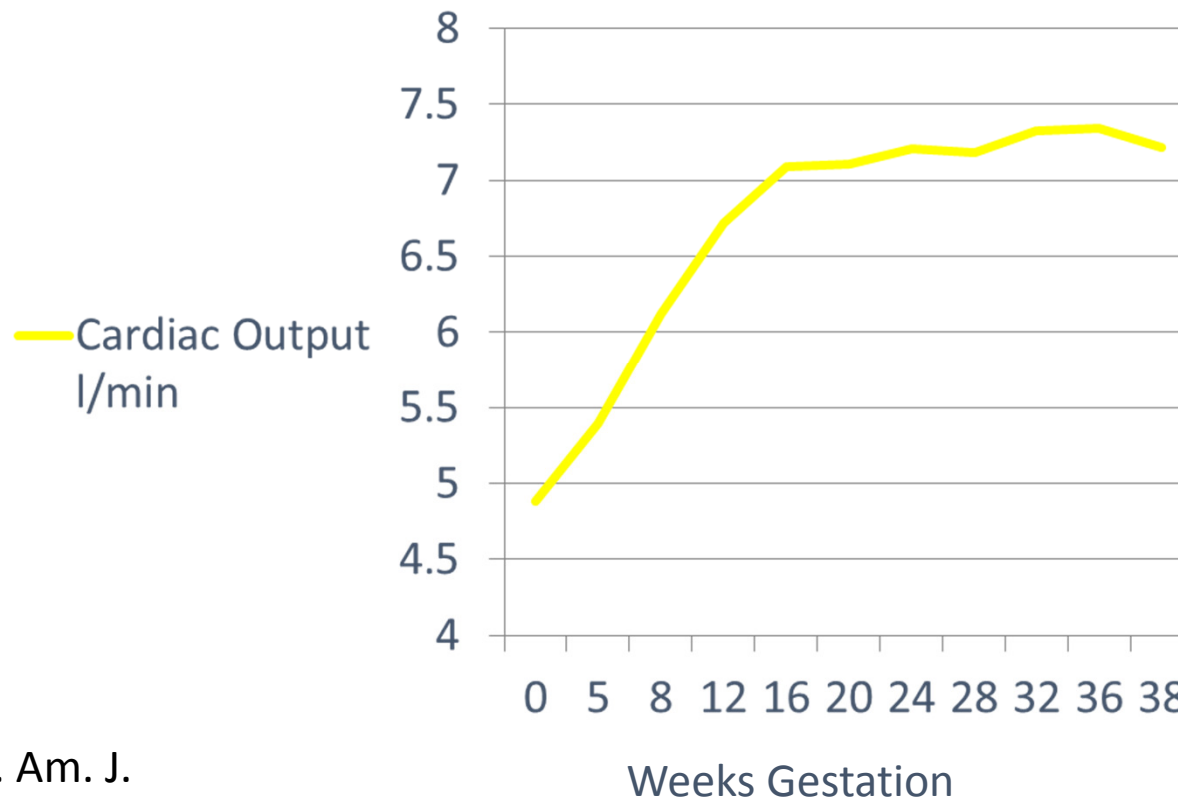
$$\text{Stroke Volume} \sim \frac{\text{Preload}}{\text{SVR}}$$

# Hemodynamic Changes

$$\text{Cardiac Output} = \text{Stroke Volume} \times \text{Heart Rate}$$

$$\text{Stroke Volume} \sim \frac{\text{Preload}}{\text{SVR}}$$

# Cardiac Output Changes



Robson et al. Am. J.  
Physiol. 256. 1989



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