

# Reducing Maternal Morbidity: Postpartum Hemorrhage Risk Assessment

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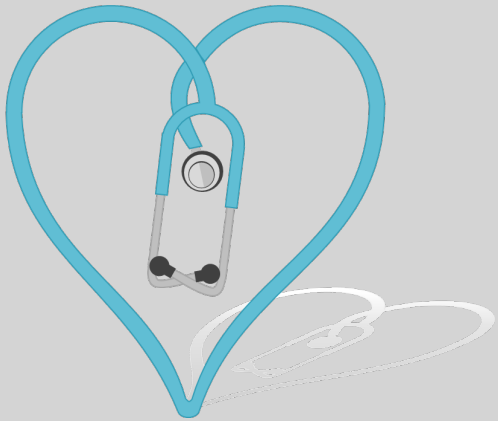
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**HARRISHEALTH**  
SYSTEM

Baylor  
College of  
Medicine

DYING THIS YEAR:  
**700  
NEW  
MOMS**

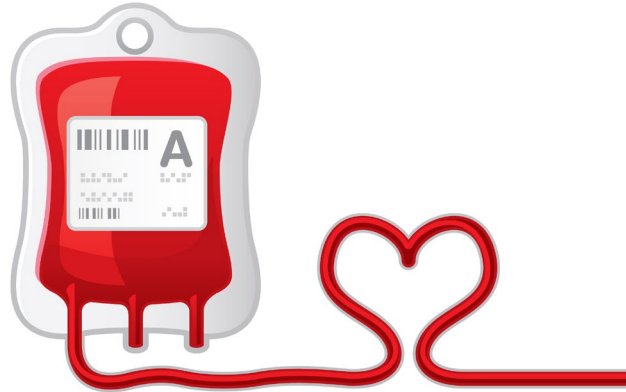


# Maternal Outcomes

unexpected outcomes  
that result in significant  
short or long-term  
consequences to a  
woman's health



**Severe Maternal Morbidity**

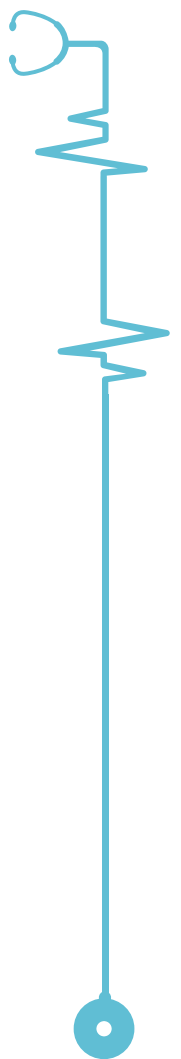
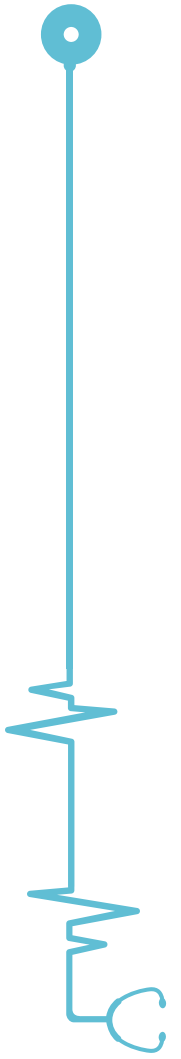
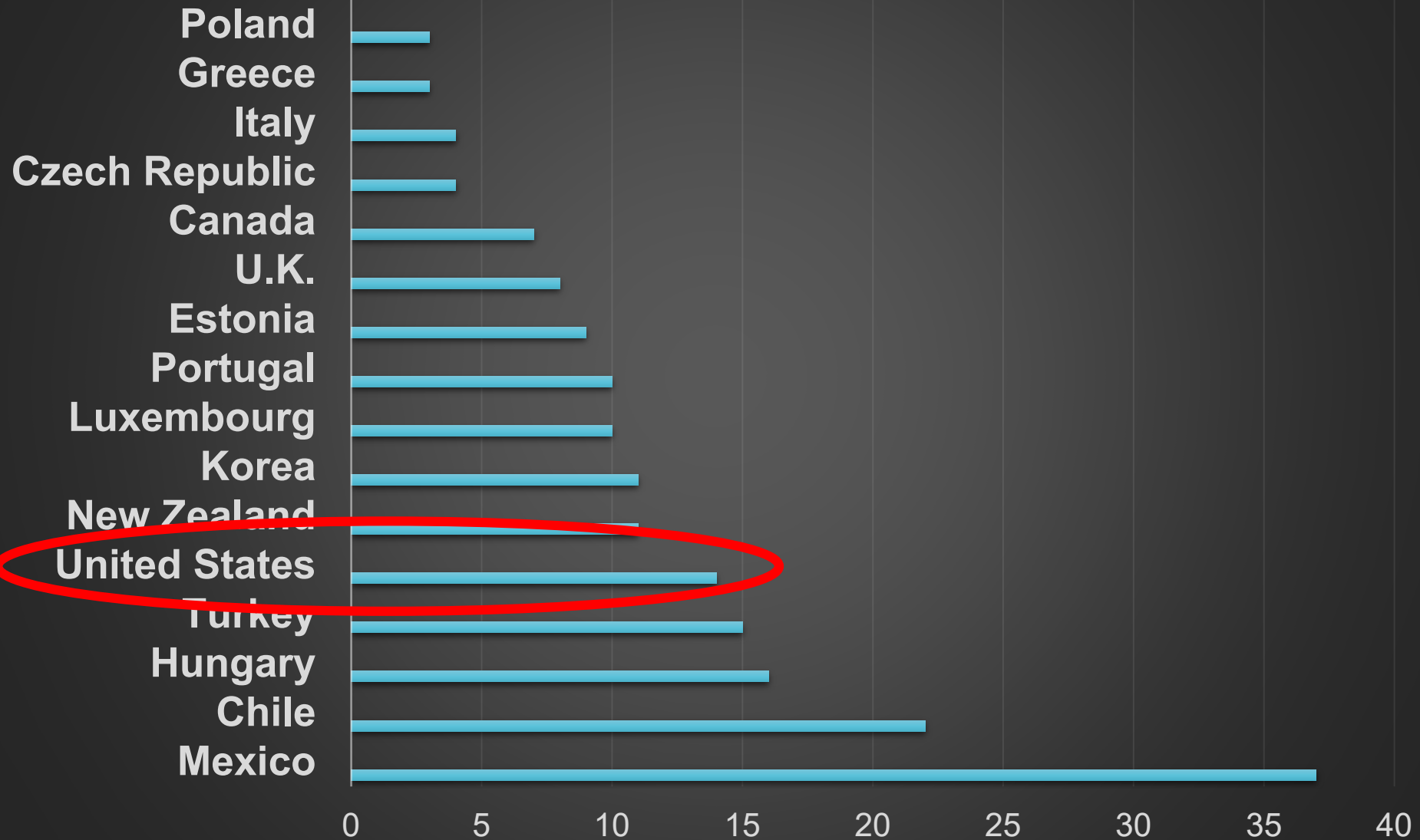


**Maternal Mortality**

death of a woman while  
pregnant or within 1 year of  
the end of a pregnancy

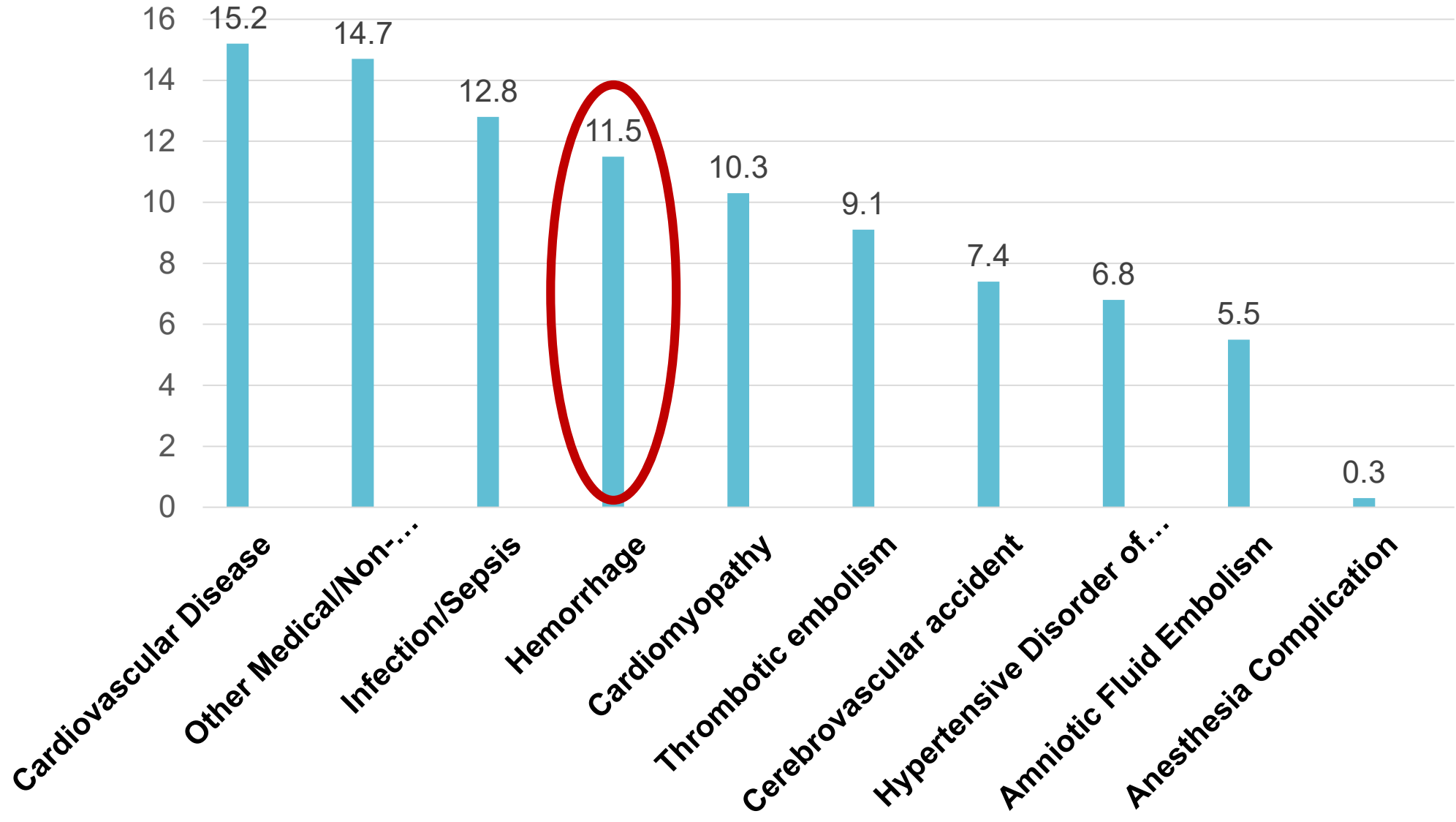


# Maternal Deaths per 100,000 Live Births



# Causes of Pregnancy-Related Deaths

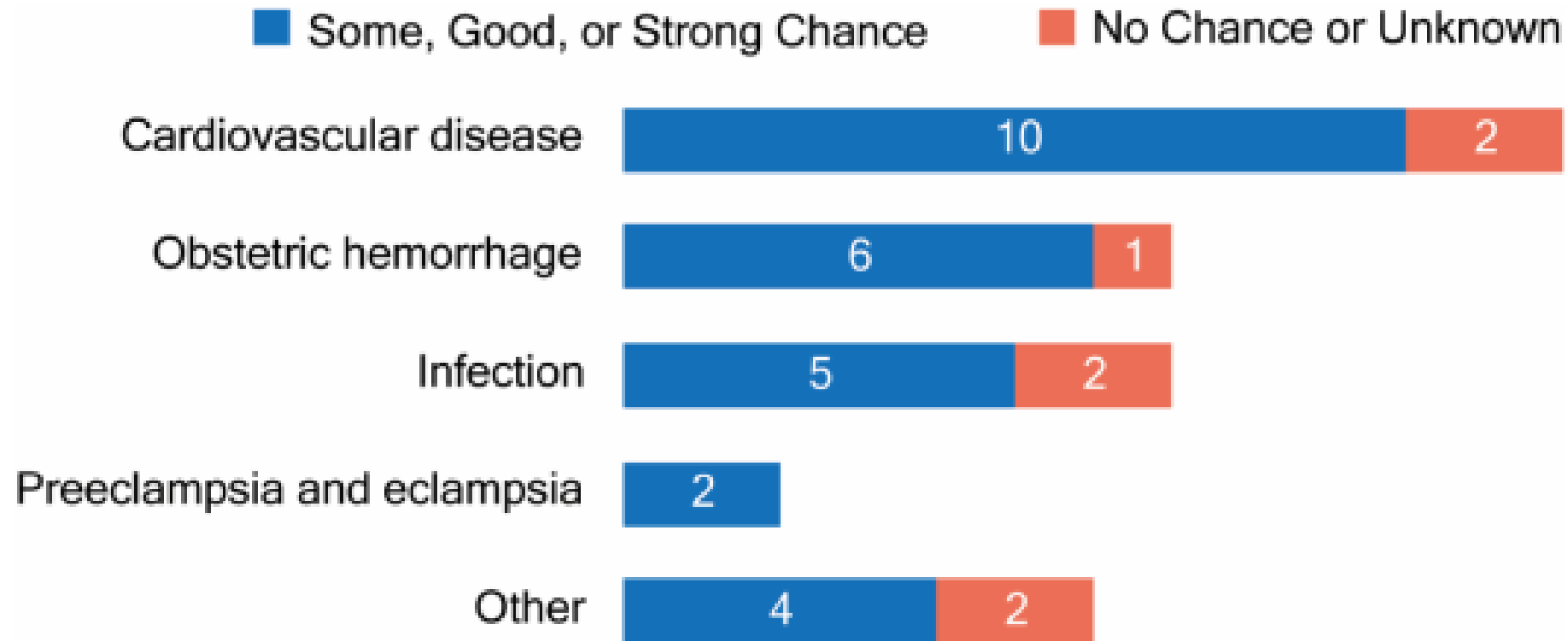
U.S. 2011-2014



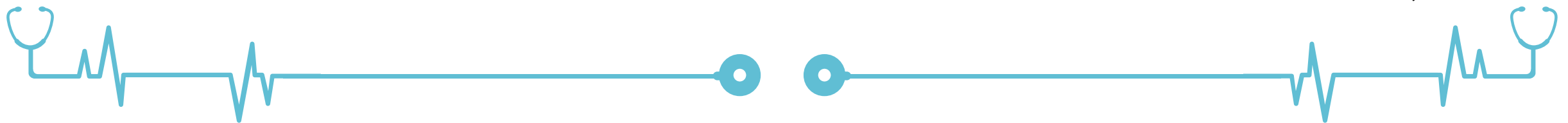
# Texas Maternal Morbidity

Cause of Death	While Pregnant	0-7 Days Post Partum	8-42 Days Post Partum	43-60 Days Post Partum	61+ Days Post Partum	Total
Drug Overdose	0	3	7	5	49	64
Hemorrhage	3	12	2	0	3	20
Hypertension	0	7	4	0	7	18
Infection/ Sepsis	1	3	14	3	11	32
Suicide	0	1	2	2	28	33

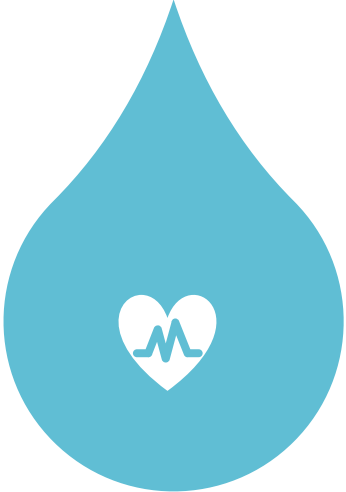
# Majority of Maternal Deaths – Preventable



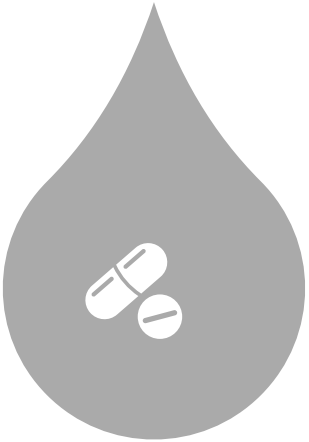
Texas, 2012



# Complex set of factors associated with increased risk for maternal death in Texas



**Age 40  
years and  
older**



**Late or no  
prenatal  
care**



**Chronic  
Health:  
Obesity,  
Hypertension,  
Diabetes**



**Cesarean  
Delivery**

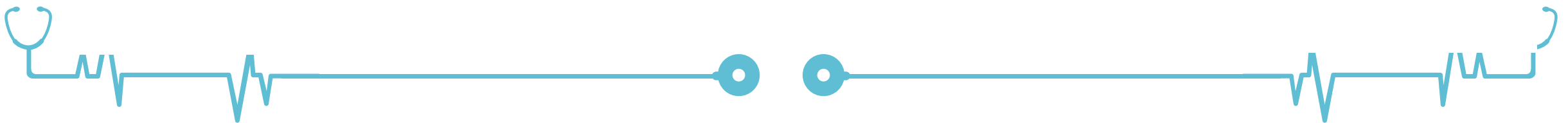
DSHS, 2018





# Severe Maternal Morbidity(SMM)

- **For every maternal death, 100 women experience morbidity**
- **137 women per day – 50,000 per year, suffer severe complications or life-threatening injuries**



# Severe Maternal Morbidity

## Transfusions

Increased from 24.5 in 1993 to 122.3 in 2014



## Hysterectomy

Increased 55% over time, from 6.9 in 1993 to 10.7 in 2014



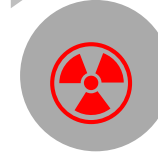
## Ventilation

Increased 93% over the years, from 4.1 in 1994 to 7.9 in 2014



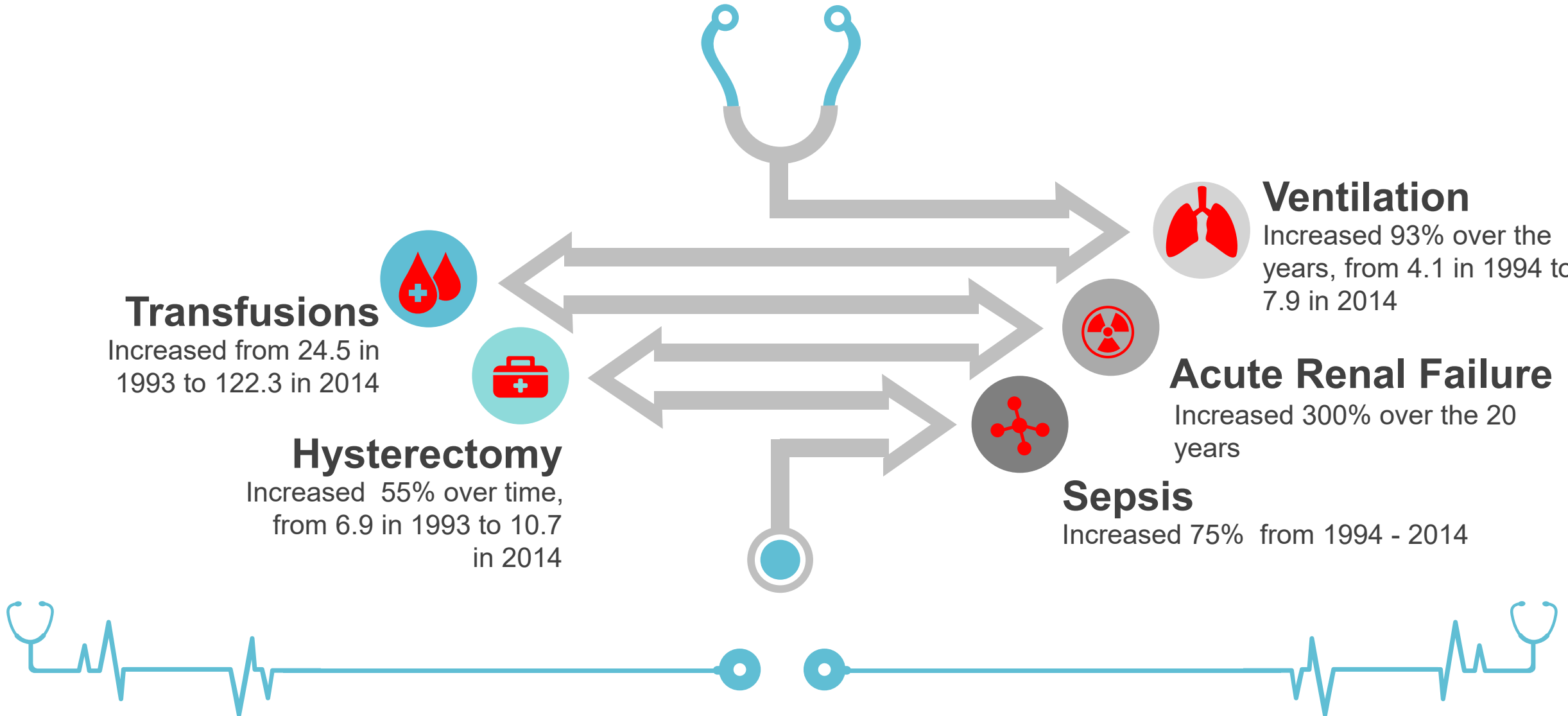
## Acute Renal Failure

Increased 300% over the 20 years



## Sepsis

Increased 75% from 1994 - 2014





# THE ALLIANCE FOR INNOVATION ON MATERNAL HEALTH (AIM) IS A NATIONAL PARTNERSHIP OF ORGANIZATIONS POISED TO REDUCE SEVERE MATERNAL MORBIDITY



American College of Nurse-Midwives



American Academy of Family Physicians



American College of Obstetricians and Gynecologists



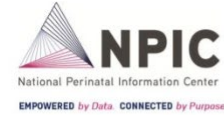
American Hospital Association



National WIC Association



National Institute for Children's Health Quality



National Perinatal Information Center



National Association of Nurse Practitioners in Women's Health



Association of Maternal & Child Health Programs



American Society of Addiction Medicine



A professional membership group of the American Hospital Association



Association of State and Territorial Health Officials



Association of Women's Health, Obstetric and Neonatal Nurses



Black Mamas Matter Alliance



California Maternal Quality Care Collaborative



Every Mother Counts



Society for Obstetric Anesthesia and Perinatology



Trinity Health



CityMatCH



Emergency Nurses Association



Genetic Alliance



HealthStream



March of Dimes



National Healthy Start Association



### READINESS

Every unit

- Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compressions stitches
- Immediate access to hemorrhage medications (kit or equivalent)
- Establish a response team - who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
- Establish massive and emergency release transfusion protocols (type-O negative/uncrossmatched)
- Unit education on protocols, unit-based drills (with post-drill debriefs)

### RECOGNITION & PREVENTION

Every patient

- Assessment of hemorrhage risk (prenatal, on admission, and at other appropriate times)
- Measurement of cumulative blood loss (formal, as quantitative as possible)
- Active management of the 3rd stage of labor (department-wide protocol)

### RESPONSE

Every hemorrhage

- Unit-standard, stage-based, obstetric hemorrhage emergency management plan with checklists
- Support program for patients, families, and staff for all significant hemorrhages

### REPORTING/SYSTEMS LEARNING

Every unit

- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of serious hemorrhages for systems issues
- Monitor outcomes and process metrics in perinatal quality improvement (QI) committee

PATIENT SAFETY BUNDLE

# Obstetric Hemorrhage

Bundle: noun wrapped up to

AIM bundle: A in maternity c

Goal of the A standard app

States that join safety bundle and delivery h


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**After bundle:  
20.8% reduction  
in SMM**

Among hospitals who implemented the national hemorrhage safety bundle, women with obstetric hemorrhage experienced a 20.8% reduction in SMM (Main, et al., 2017)

Hospitals who implemented the hemorrhage safety bundle had an 11.7% decrease in overall SMM among all obstetric patients



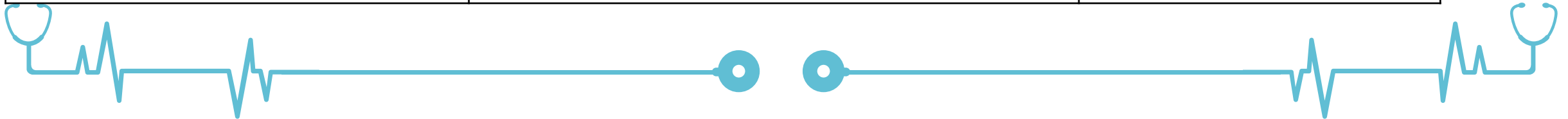
# Postpartum Hemorrhage Risk Assessment

- Prevention of postpartum hemorrhage starts with preparation
- More than half of women who hemorrhage due to uterine atony have no known risk factors
- Identification of associated risk factors during the antenatal and intrapartum periods can improve readiness to respond for those with known risks



# Risk Stratification

Low	Medium	High
≤ 4 previous vaginal births	HGB < 8	Placenta Previa
Singleton	Platelets < 100,000	Suspected Accreta
No previous PPH	≥ 3 Prior CD	Abruptio
	> 4 vaginal births	Coagulopathy
	Chorioamnionitis	
	Multiple Gestation	
	EFW > 4250	
	History of postpartum hemorrhage	
	Obesity (BMI >40)	
	Large Uterine Fibroids (>5 cm)	



# Actions based on risk

## Low Risk

- Type and screen on admission (if antibody positive: crossmatch)
- Postpartum order: Oxytocin 30u in 500 mL LR 167cc bolus, then 42 cc/hr for 4 hours

## Medium Risk

- Type and screen on admission (if antibody positive: crossmatch)
- Discuss risk of hemorrhage with patient
- Postpartum order: Oxytocin 30u in 500 mL LR 167cc bolus, then 42 cc/hr for 8 hours

## Medium (+): $\geq 2$ Medium Risk Factors

- Same as above, plus crossmatch 2 units PRBCs

## High Risk:

- Crossmatch 4 (or more) units
- Discuss risk of hemorrhage and transfusion with patient
- Postpartum order: Oxytocin 30u in 500 mL LR 167cc bolus, then 42 cc/hr for 24 hours



# Ben Taub Hospital Harris Health System



Urban Academic Level 1 Trauma Center

Residency Program of 48

3500-4000 deliveries/year

- 86% “high risk”

## 5326 Deliveries (Aug 2016 – May 2018)

Risk Category	qBL Vaginal Delivery	qBL Cesarean Delivery	PPH n (%)	P Value	Sensitivity for PPH	Specificity for PPH
Low (n=946)	744 +/- 20	1060 +/- 33	291 (30%)	<0.001	54%	23%
Medium (n=325)	873 +/- 422	696 +/- 283	159 (49%)	<0.001	29%	80.7%
Medium plus (n=93)	987 +/- 31	1564 +/- 119	57 (61.3%)	<0.001	10.6%	95.8%
High (n=40)	2092 +/- 735	2735 +/- 456	34 (85%)	<0.001	6.33%	99.3%

qBL = quantitative blood loss  
Data are displayed as either mean +/- standard deviation, or N (%)

\*PPH- postpartum hemorrhage

# Conclusion



- Risk stratification systems may increase awareness
- All team members must be prepared to recognize and respond to hemorrhage for women in every hemorrhage risk category



# Thank You

References Available Upon Request



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