

# **Women's Issues and Venous Thromboembolism**

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# Lifetime hormonal exposure

Adolescence → Adult → Child-bearing → Menopause

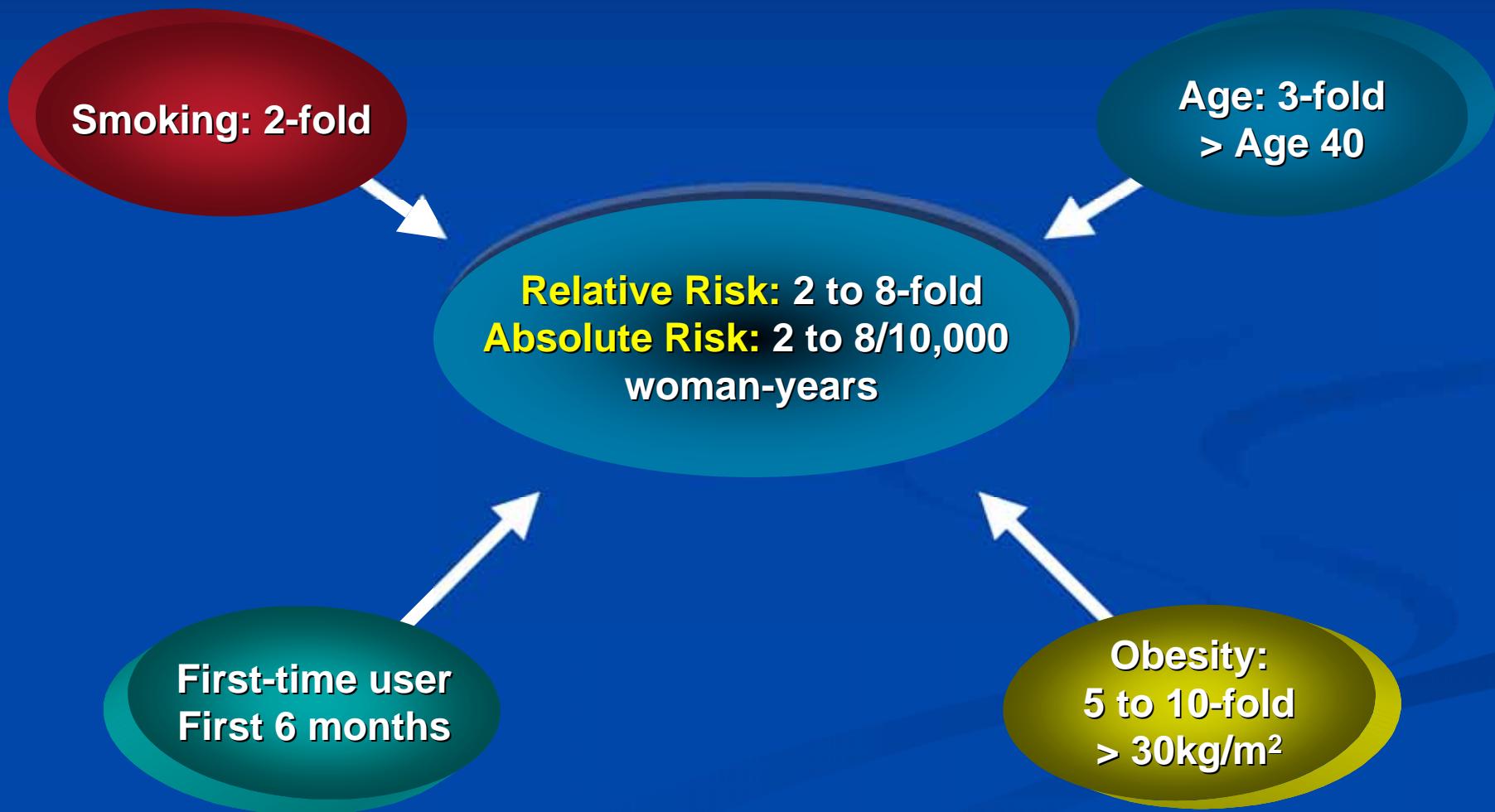
OCPs

Pregnancy

HRT

Lifetime estrogen exposure

# Risk of VTE with OCPs



# OCP formulation

First

Mestranol  
100 µg

Second

Ethinyl estradiol  
30-50 µg  
+  
Levonorgestrel

Third

Ethinyl estradiol  
+  
Desogestrel  
or  
Genostodene

Fourth

Drospirenone  
or  
Cyproterone

Transdermal  
Injectable  
Intrauterine device

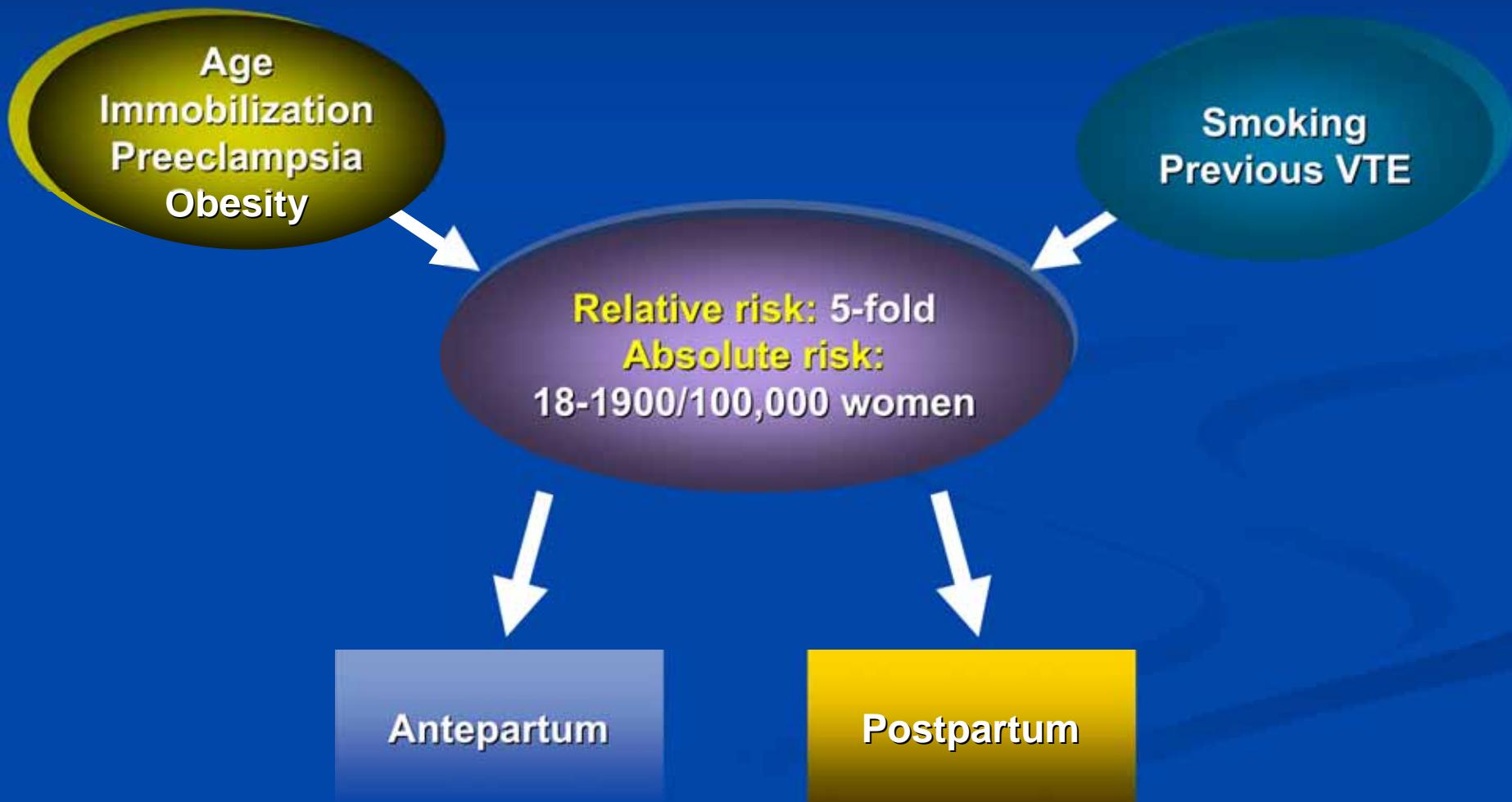
Progestin-only  
Medroxyprogesterone  
Levonorgestrel  
Norethindrone  
Norgestrel

# OCPs and Thrombophilia

Mutation	No. Studies	Cases	Controls	OR (95% CI)
None	7	411/733	529/1797	<b>3.1 (2.17, 4.42)</b>
Factor V L	6	69/365	73/1252	<b>3.78 (2.22, 6.42)</b>
Prothrombin G	3	30/260	64/760	<b>1.34 (0.81, 2.23)</b>
AT3	1	5/60	4/144	<b>3.18 (0.82, 12.29)</b>
Protein C	1	17/60	20/144	<b>2.45 (1.18, 5.11)</b>
Protein S	2	21/85	13/250	<b>5.31 (2.48, 11.37)</b>
Fact V + Pro G	2	5/220	3/621	<b>4.03 (1.01, 16.01)</b>

Adapted from Wu, et al. Thromb Haemost 2005;94

# VTE Risk During Pregnancy



# Pregnancy and Thromphobilia

Mutation	No. Studies	Cases	Controls	OR (95% CI)
FVL (Homo)	5	29/91	145/1248	<b>34.4 (9.86, 120.05)</b>
Fact V L (Hetero)	6	96/226	263/1595	<b>8.32 (5.44, 12.7)</b>
Prothrombin G	4	42/61	277/1005	<b>6.8 (2.46, 18.77)</b>
MTHFR (Homo)	4	20/128	89/543	<b>0.74 (0.22, 2.48)</b>
AT 3	3	8/11	242/815	<b>4.69 (1.30, 16.96)</b>
Protein C	3	23/32	232/715	<b>4.76 (2.15, 10.57)</b>
Protein S	3	15/28	250/911	<b>3.19 (1.48, 6.89)</b>

Adapted from Robertson, et al. BJH 2006;132

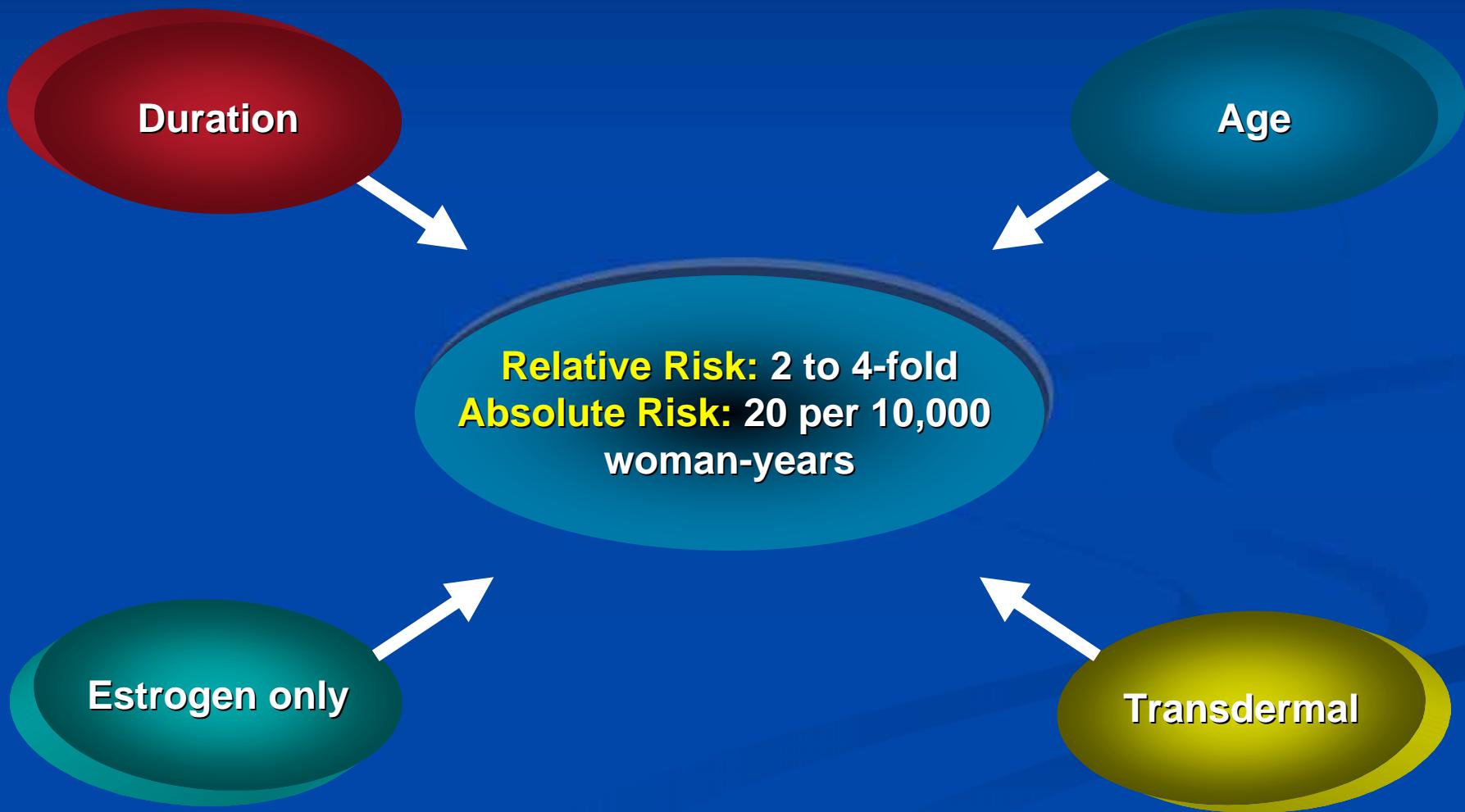
# Prevention during pregnancy

Risk Group	Recommendation
Single VTE / No Thrombophilia	Surveillance
Single VTE / Thrombophilia	LMWH or UFH Prophylaxis
Multiple VTE	LMWH or UFH Treatment

## Treatment

Pregnancy	Labor	Post-partum
UFH or LMWH	Induction (vaginal) ↓ D/C UFH/LMWH X 24 hrs	C-section ↓ Mechanical prophylaxis

# Risk of VTE with HRT



# HRT and Thrombophilia

Mutation	Estrogen	Cases	Controls	OR (95% CI)
FVL	None	16	18	<b>2.6 (1.3, 5.4)</b>
	Oral	11	3	<b>16.4 (4.3, 62.2)</b>
	Transdermal	8	6	<b>4.6 (1.6, 13.8)</b>
Protein G	None	15	7	<b>6.4 (2.5, 16.5)</b>
	Oral	5	0	—
	Transdermal	6	7	<b>3.3 (1.1, 10.2)</b>

Adapted from Straczek, Celine et al., "Prothrombotic Mutations, Hormone Therapy, and Venous Thromboembolism among Postmenopausal Women: Impact of the Route of Estrogen Administration," Circulation 2005; 112:3495-3500

# Prevention with HRT

**Stratify**

**High Risk:**  
Thrombophilia  
History of VTE

**Low Risk:**  
Low-dose estrogen  
Estrogen-only  
Transdermal estrogen  
Short duration  
Young post-menopause