

Venous Thromboembolism Prophylaxis for the Medical Patient

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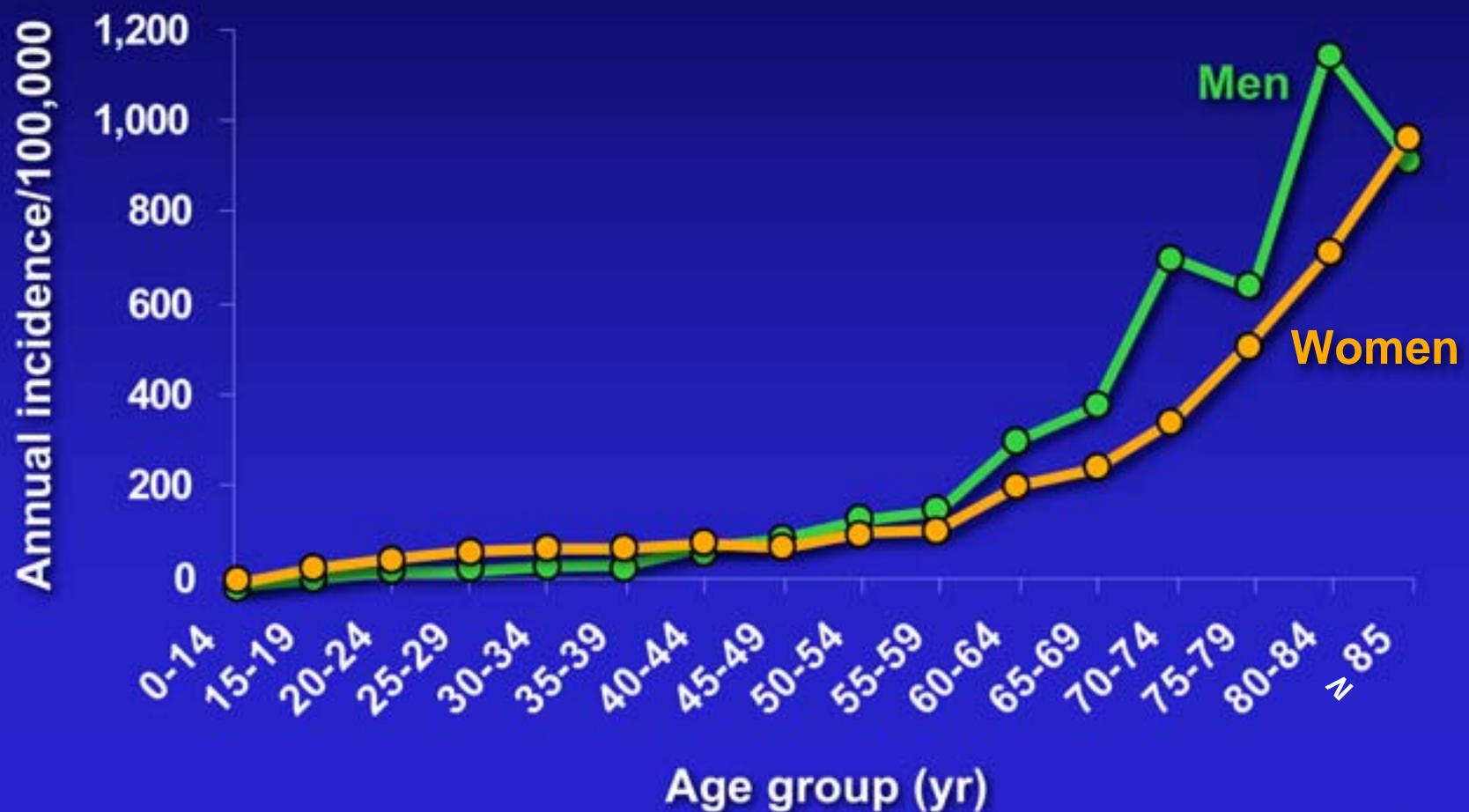
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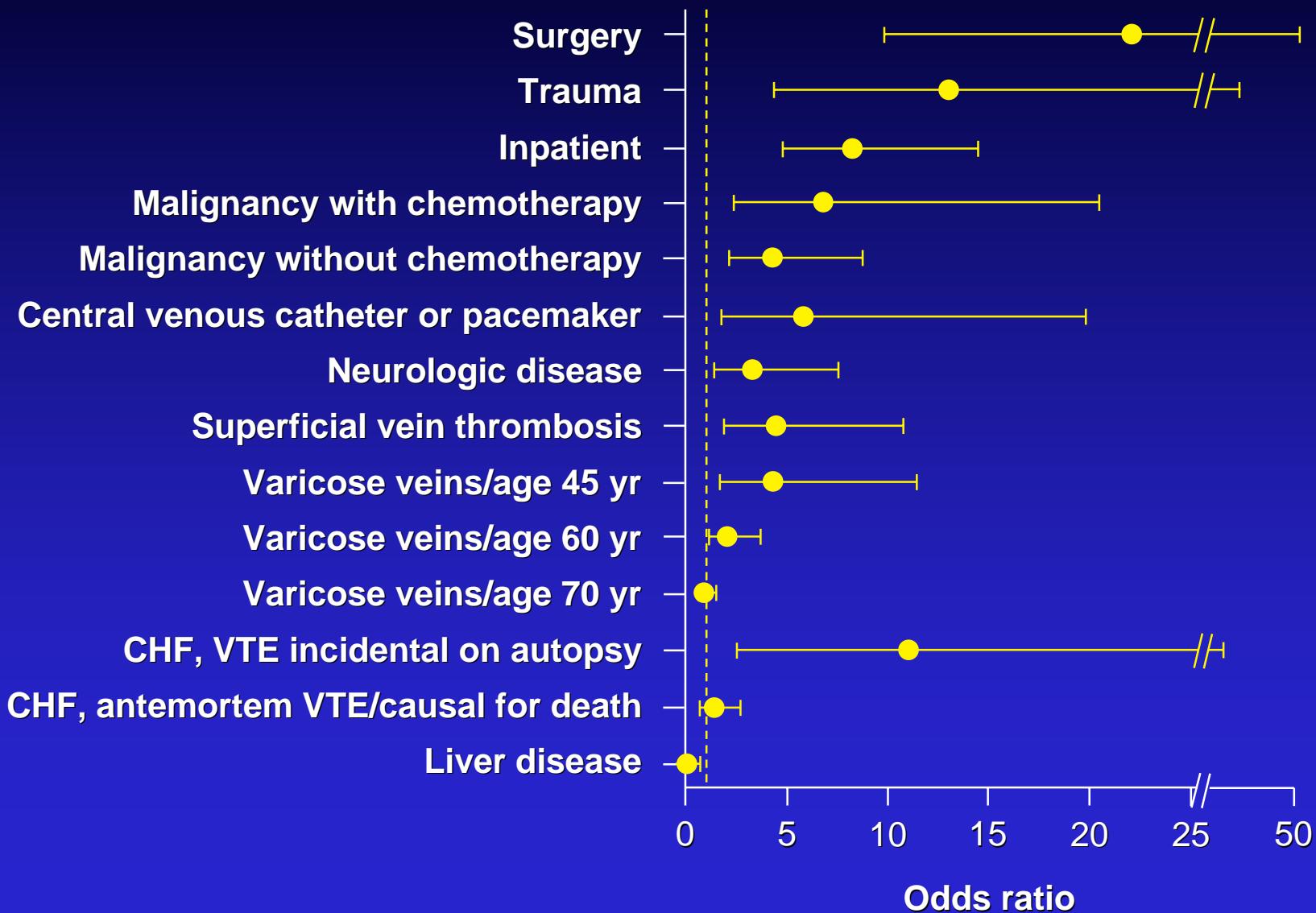
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Annual Incidence of VTE in Olmsted County, MN: 1966-1995 By Age and Gender



Risk Factors for DVT or PE

Nested Case-Control Study (n=625 case-control pairs)



Incidence of VTE in Olmsted County, MN: 1966–1990

Overall and by Location in Community at Onset

Population	Overall/ 100,000 person-years	Location at onset	
		In-hospital/ 100,000 bed-years	Community/ 100,000 person-years
Overall*	117	9,605	71
Men**	130	12,780	77
Women**	110	6,586	65
Deep vein thrombosis	48	4,593	36
Pulmonary embolism	69	5,012	35

* Adjusted to age and sex distribution of 1980 US whites.

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VTE Risk Factors: Medical Patients

Characteristic	OR*	AR [†] (%)
Hospitalization for Acute Medical Illness	10.5	21.5
Nursing Home Confinement	2.3	13.3
Active Malignant Neoplasm		
Without chemotherapy	5.2	6.4
With chemotherapy	9.7	11.6
Central Venous Catheter/Transvenous Pacemaker	5.9	9.1
Neurological Disease with Extremity Paresis	6.1	6.9
Prior Superficial Vein Thrombosis	3.8	5.4

*Odds Ratio

†Population-Attributable Risk

Heit, et al. Arch Intern Med 2000

Heit, et al. Arch Intern Med 2002

VTE Risk Factors: Medical Patients

Characteristic	OR	95% CI*
Myeloproliferative Disorders	5.10	1.14, 18.53
Nephrotic Syndrome	2.74	1.09, 6.88
Inflammatory Bowel Disease	2.82	0.95, 8.37
Oral Contraceptives	2.65	0.98, 7.15
Pregnancy/Postpartum	4.24	1.15, 15.61
Estrogen Therapy	1.25	0.79, 1.97
Tamoxifen	4.12	1.10, 15.43

*95% Confidence Interval

Heit, et al. Blood 2004

Independent Risk Factors for VTE after Hospitalization for Acute Medical Illness*: Olmsted County 1988-97 (n=198)

Risk Factor	OR	95% CI	P-value
Age (per 10 years)	1.23	1.08, 1.40	0.001
BMI (kg/m^2 , per 2-fold increase)	2.73	1.52, 4.92	<0.001
Neurological Disease with Extremity Paresis	5.07	2.13, 12.07	<0.001
Fracture	4.06	1.62, 10.14	0.003
Chronic Renal Disease	3.70	1.08, 12.67	0.037
Central Venous Catheter	3.30	1.63, 6.70	<0.001
Prior Superficial Vein Thrombosis	2.46	1.19, 5.11	0.016
Immobility Requiring Physical Therapy	2.30	1.63, 4.05	0.004
Anticoagulation Prophylaxis	0.39	0.17, 0.86	0.019

*Controlled for Active Cancer and Event Year

Heit, et al. J Thromb Haemost 2005

Relative Risk of VTE by Tumor Site

Tumor Site	Observed	Expected	RR	95%CI
Pancreas	13	0.35	37.0	19.7, 63.2
Lymphoma	15	0.47	31.8	17.8, 52.4
Brain	3	0.11	26.8	5.5, 77.9
Liver	2	0.08	24.0	2.9, 86.7
Leukemia	8	0.38	21.0	9.0, 41.3
Other digestive	4	0.24	17.0	4.6, 43.5
Other gynecologic	7	0.50	14.1	5.7, 19.1
Multiple myeloma	2	0.16	12.3	1.5, 44.4
Bladder	7	0.60	11.7	4.7, 24.2

VTE Risk Factors: Nursing Home Residents

Characteristic	OR	95% CI	P-value
CHF	0.90	0.41, 1.99	0.79
COPD	1.14	0.48, 2.67	0.77
Diabetes	0.59	0.25, 1.41	0.23
Malignancy	1.77	0.83, 3.79	0.14
Neurological disease*	1.00	0.27, 3.72	1.00
Parkinson's disease	0.27	0.06, 1.21	0.09
Fracture	0.28	0.08, 1.01	0.05
Infection	1.24	0.57, 2.73	0.59
Obesity	1.11	0.37, 3.32	0.85

*Neurological disease included hemiplegia, multiple sclerosis, and cauda equina syndrome

Parenteral Pharmacologic Prophylaxis

- λ Unfractionated (Standard) Heparin (UFH)
- λ Low-Molecular-Weight Heparin (LMWH)
 - enoxaparin sodium (Lovenox™)**
 - dalteparin sodium (Fragmin™)**
 - (tinzaparin sodium [Innohep™])**

Pharmacologic Prophylaxis

- λ Parenteral-Indirect Factor Xa Inhibitor
fondaparinux (Arixtra™)
- λ Parenteral-Direct Thrombin (IIa) Inhibitor
lepirudin (Refludan™)
argatroban
bivalirudin (hirulog)
- λ Oral-warfarin sodium

“Mechanical” Prophylaxis

- λ **Intermittent Pneumatic Compression (IPC)**
 - calf only, or calf & thigh IPC
 - venous foot pump
- λ **Graduated Compression Stockings (GCS)**
- λ **(Inferior Vena Cava [IVC] Filter)**

Prophylaxis Recommendations

Acutely Sick Medical Inpatients

- λ UFH 5000 units subcutaneously three times daily, or
- λ LMWH according to recommended dose and dose schedule.
- λ GCS or IPC when anticoagulant prophylaxis is contraindicated.

7th ACCP Consensus Conference. Chest 2004