

盆腔术后下肢深静脉血栓 危险因素及预测

首都医科大学附属北京朝阳医院妇产科 张震宇

关于深静脉血栓

Deep Vein Thrombosis (DVT)

Pulmonary Embolism (PE)

Venous Thromboembolism (VTE)

DVT+PE
=VTE

关于DVT

Virchow学说

- 血流缓慢
- 血管内皮损伤
- 血液高凝状态

下肢DVT

- 近端DVT：腠静脉以上
- 远端DVT：腠静脉以下

盆腔术后下肢DVT的危险性及发生率

10% 住院患者死亡原因

40% 妇科术后死亡原因

妇科疾病 1.14%

妇科腹腔镜手术后0.7%

妇科盆底手术后0.3%

妇科肿瘤患者
4%

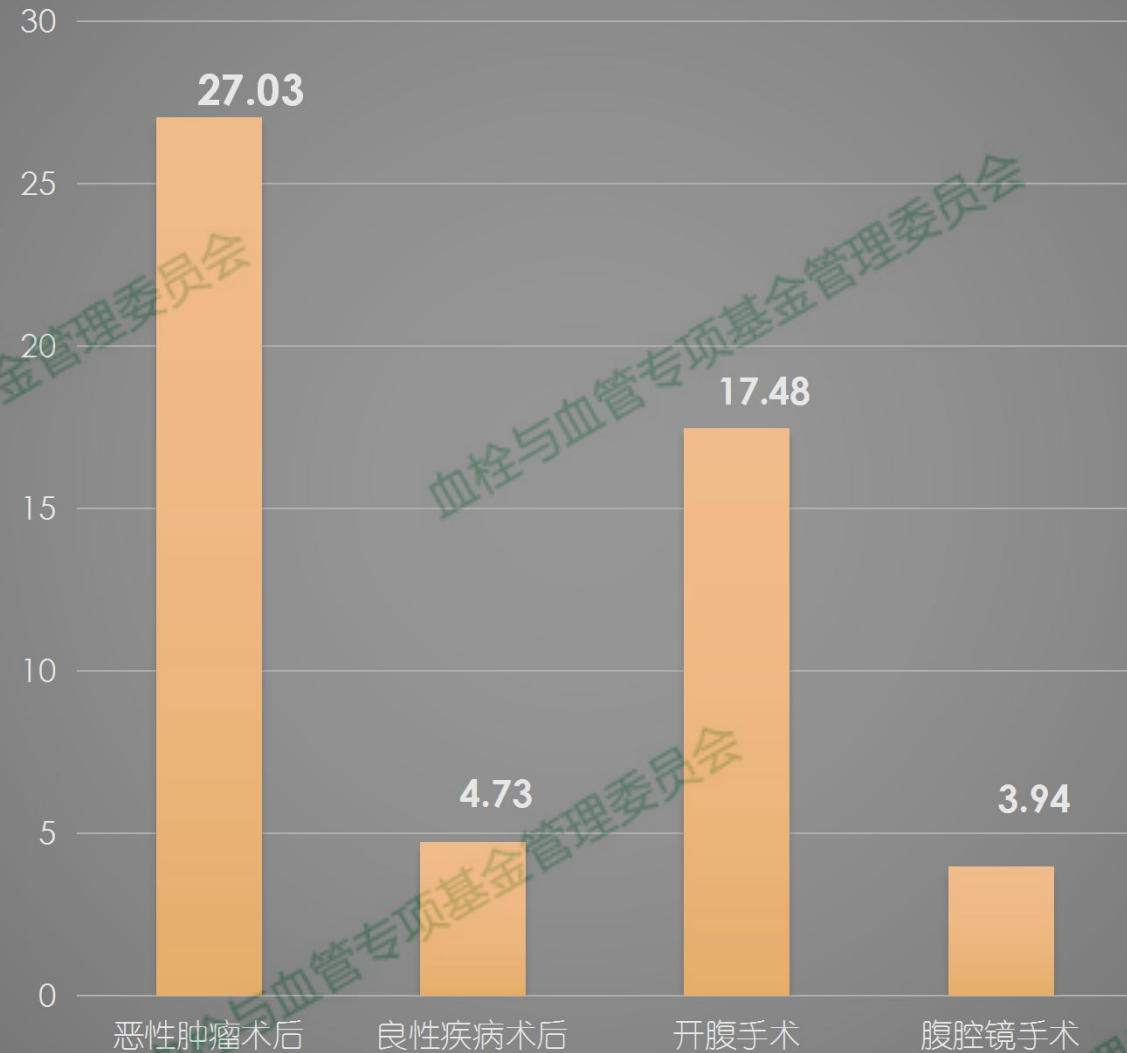
我国妇科术后DVT预防现状和问题

- ▶ 多数妇科医生认为妇科手术后血栓发生率很低，而实际并没有相关数据支持
- ▶ 为避免术后出血，多数医生不愿采用药物预防
- ▶ 各种原因导致机械预防不能普遍使用
- ▶ 围手术期血栓检查和预防增加医疗支出

我国盆腔术后DVT发生率

- ▶ 739 名患者 (148 例妇科恶性肿瘤, 591 例妇科良性疾病)
- ▶ 术后DVT 9.2% (68/739)

盆腔术后下肢DVT发生率 (%)



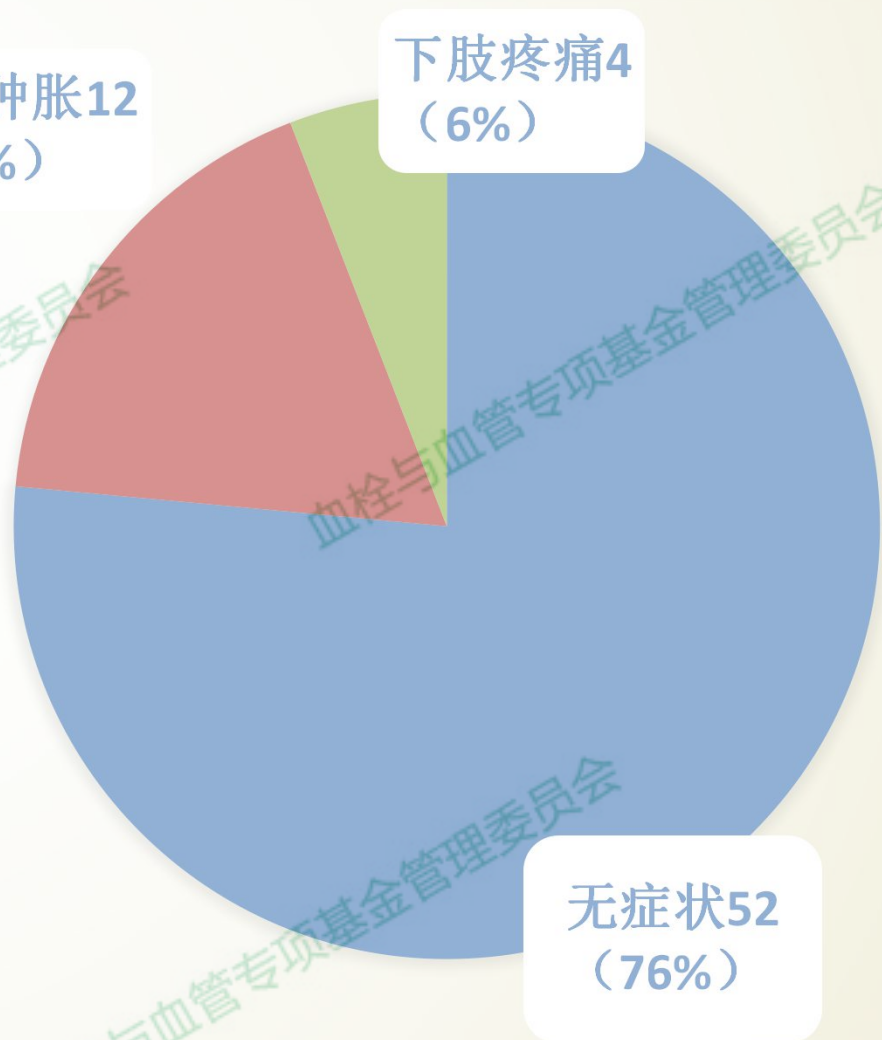
盆腔术后DVT的主要症状

- ➔ 无症状 52例 (76.47%)
- ➔ 有症状 16例 (23.53%)

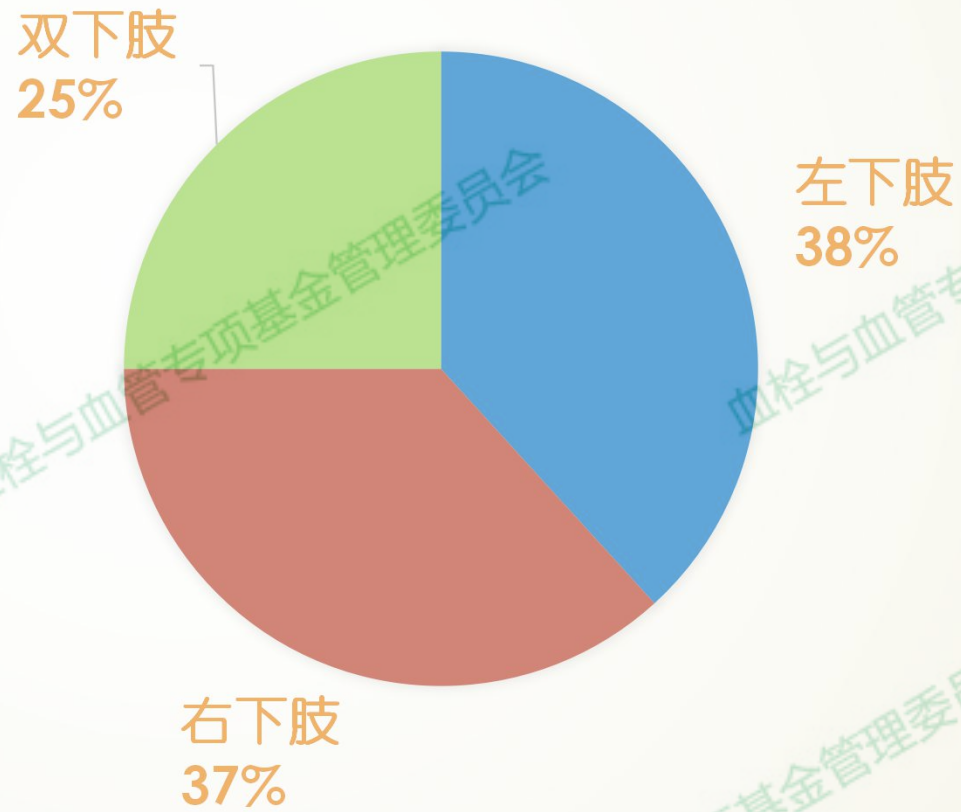
下肢肿胀12
(18%)

下肢疼痛4
(6%)

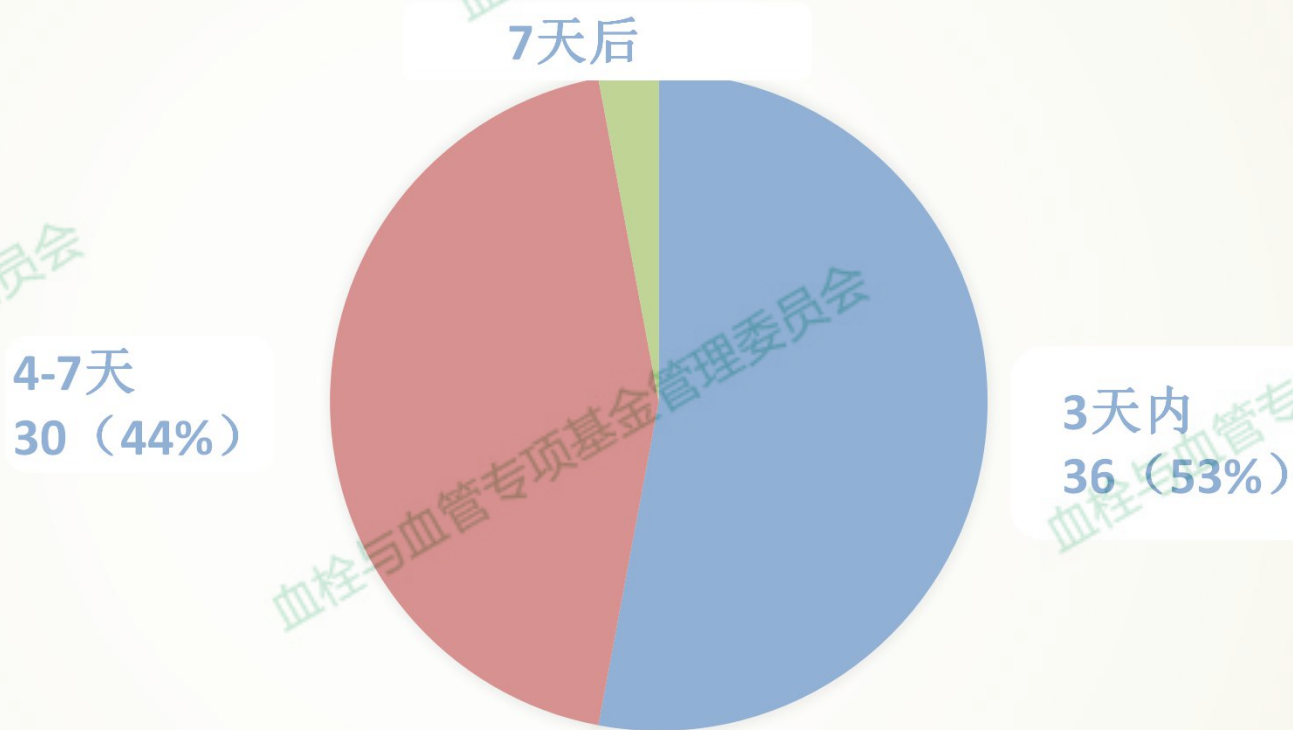
无症状52
(76%)



盆腔术后下肢DVT的发病部位



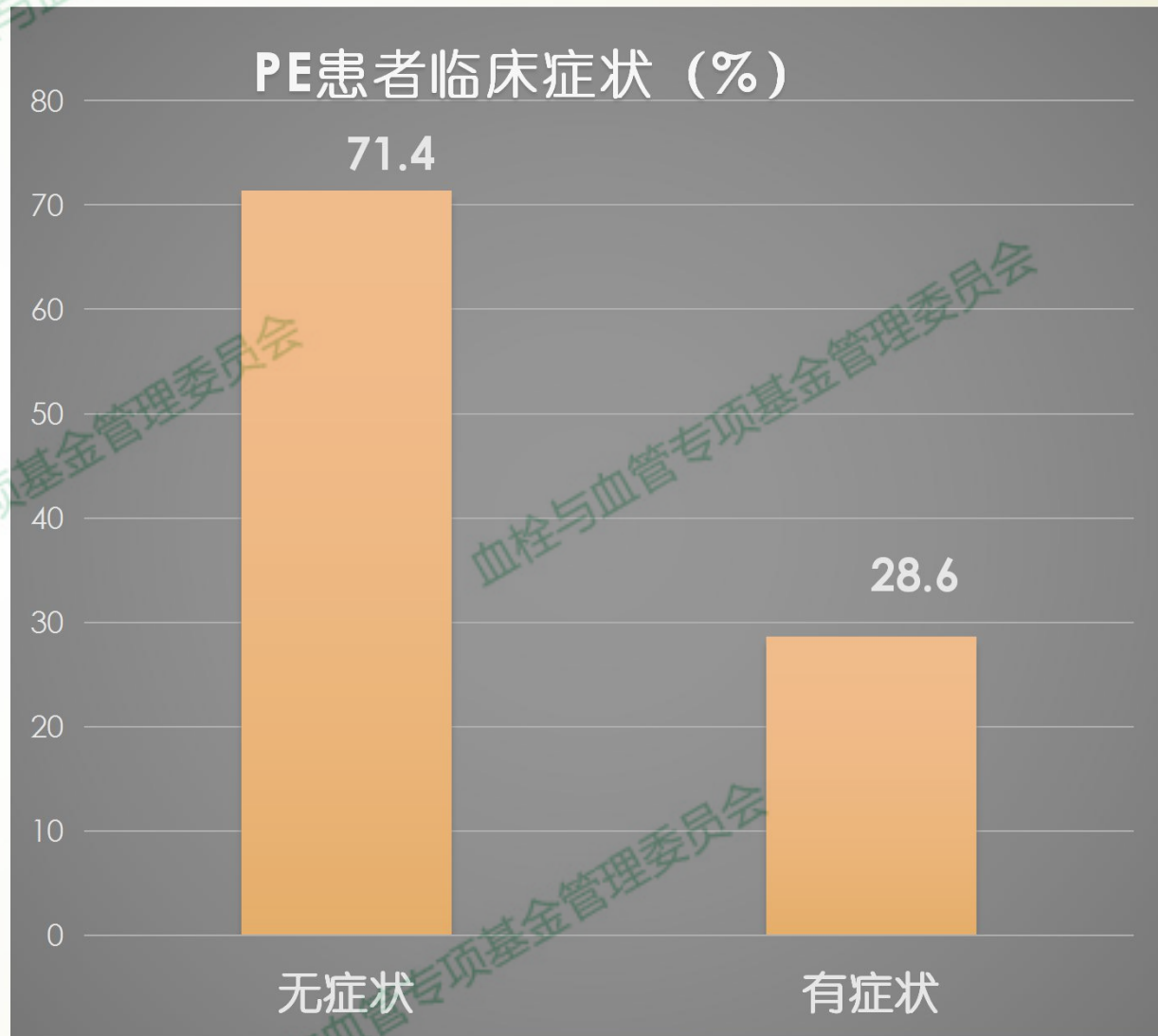
盆腔术后DVT发生的时期



术后的第一周内是发生血栓的高危时期

盆腔术后肺栓塞发生率和主要表现

- ▶ 46例DVT患者接受了CTPA检查，其中21例合并肺栓塞（45.6%）
- ▶ 21例患者中仅6例（28.6%）有症状：5例呼吸困难和1例突发晕厥



术后下肢DVT的危险因素

患者

- ▶ 年龄>60岁
- ▶ VTE病史
- ▶ 恶性肿瘤
- ▶ 麻醉时长 ≥ 2 小时
- ▶ 卧床时长 ≥ 4 天
- ▶ 住院时间长
- ▶ 男性患者

手术

- ▶ 开腹手术（腹部或盆腔）
- ▶ 恶性肿瘤手术
- ▶ 手术并发症（泌尿系感染、急性肾功能不全、术后输血、围术期急性心梗、肺部感染等）

术后DVT评价系统

AT9 VTE Risk Category	Patient Population						Estimated Baseline Risk in the Absence of Pharmacologic or Mechanical Prophylaxis, %	
	Patients Undergoing Major General, Thoracic, or Vascular Surgery		Patients Undergoing General Surgery, Including GI, Urological, Vascular, Breast, and Thyroid Procedures		Patients Undergoing Plastic and Reconstructive Surgery			
	Rogers Score	Observed Risk of Symptomatic VTE, %	Caprini Score	Observed Risk of Symptomatic VTE, %	Caprini Score	Observed Risk of VTE, %		
Very low	<7	0.1	0	0	0-2	NA	Most outpatient or same-day surgery	< 0.5
Low	7-10	0.4	1-2	0.7	3-4	0.6	Spinal surgery for nonmalignant disease	1.5
Moderate	>10	1.5	3-4	1.0	5-6	1.3	Gynecologic noncancer surgery Cardiac surgery Most thoracic surgery Spinal surgery for malignant disease	3.0
High	NA	NA	≥5	1.9	7-8	2.7	Bariatric surgery Gynecologic cancer surgery Pneumonectomy Craniotomy Traumatic brain injury Spinal cord injury Other major trauma	6.0

Roger Score

- 数据来源：183069名普外科, 血管外科, 胸外科手术患者
- 评价了症状性DVT发生率
- 极低危0.1%，低危0.5%，中危1.5%
- 缺点：复杂，冗长，不便于临床应用，没有在其他外科手术患者中进行验证

Table 6—Risk Assessment Model From the Patient Safety in Surgery Study

Risk Factor	Risk Score Points
Operation type other than endocrine	
Respiratory and hernic	9
Thoracoabdominal aneurysm, embolectomy/ thrombectomy, venous reconstruction, and endovascular repair	7
Aneurysm	4
Mouth, palate	4
Stomach, intestines	4
Integument	3
Hernia	2
ASA physical status classification	
3, 4, or 5	2
2	1
Female sex	1
Work RVU	
> 17	3
10-17	2
Two points for each of these conditions	2
Disseminated cancer	
Chemotherapy for malignancy within 30 d of operation	
Preoperative serum sodium > 145 mmol/L	
Transfusion > 4 units packed RBCs in 72 h before operation	
Ventilator dependant	
One point for each of the conditions	1
Wound class (clean/contaminated)	
Preoperative hematocrit level ≤ 38%	
Preoperative bilirubin level > 1.0 mg/dL	
Dyspnea	
Albumin level ≤ 3.5 mg/dL	
Emergency	
Zero points for each of these conditions	0
ASA physical status class 1	
Work RVU < 10	
Male sex	

Caprini Score

- 数据来源：普外科，血管外科，泌尿外科患者
- 极低危0-1分，低危2分，中危3-4分，高危≥5分
- 缺点：其中某些因素与DVT无明显相关性

Thrombosis Risk Factor Assessment

Patient's Name: _____ Age: _____ Sex: _____ Wgt: _____ lbs

Joseph A. Caprini, MD, MS, FACS, RVT
Louis W. Biegler Professor of Surgery,
Northwestern University,
The Feinberg School of Medicine,
Professor of Biomedical Engineering,
Northwestern University,
Director of Surgical Research,
Evanston Northwestern Healthcare
Email: j-caprini@northwestern.edu
Website: venousdisease.com

Choose All That Apply

Each Risk Factor Represents 1 Point

- Age 41-60 years
- Minor surgery planned
- History of prior major surgery (< 1 month)
- Varicose veins
- History of inflammatory bowel disease
- Swollen legs (current)
- Obesity (BMI > 25)
- Acute myocardial infarction
- Congestive heart failure (< 1 month)
- Sepsis (< 1 month)
- Serious lung disease incl. pneumonia (< 1 month)
- Abnormal pulmonary function (COPD)
- Medical patient currently at bed rest
- Other risk factors _____

Each Risk Factor Represents 3 Points

- Age over 75 years
 - History of DVT/PE
 - Family history of thrombosis***
 - Positive Factor V Leiden
 - Positive Prothrombin 20210A
 - Elevated serum homocysteine
 - Positive lupus anticoagulant
 - Elevated anticardiolipin antibodies
 - Heparin-induced thrombocytopenia (HIT)
 - Other congenital or acquired thrombophilia
- If yes:

Type _____

*most frequently missed risk factor

Each Risk Factor Represents 2 Points

- Age 60-74 years
- Arthroscopic surgery
- Malignancy (present or previous)
- Major surgery (> 45 minutes)
- Laparoscopic surgery (> 45 minutes)
- Patient confined to bed (> 72 hours)
- Immobilizing plaster cast (< 1 month)
- Central venous access

Each Risk Factor Represents 5 Points

- Elective major lower extremity arthroplasty
- Hip, pelvis or leg fracture (< 1 month)
- Stroke (< 1 month)
- Multiple trauma (< 1 month)
- Acute spinal cord injury (paralysis)(< 1 month)

For Women Only (Each Represents 1 Point)

- Oral contraceptives or hormone replacement therapy
- Pregnancy or postpartum (<1 month)
- History of unexplained stillborn infant, recurrent spontaneous abortion (≥ 3), premature birth with toxemia or growth-restricted infant

Total Risk Factor Score

以上评分系统存在的问题

- ▶ 都未纳入妇科手术患者
- ▶ 数据来源于西方国家，是否适用于亚洲人群或中国人群？
- ▶ 腹腔镜手术已广泛应用，研究显示腹腔镜手术后DVT发生率低，与Caprini评分系统有悖

我国盆腔术后下肢DVT的研究

患者

- ▶ 年龄、BMI
- ▶ 合并症：高血压、糖尿病、静脉曲张等
- ▶ 疾病性质

手术

- ▶ 手术方式（开腹或腹腔镜）
- ▶ 是否全身麻醉
- ▶ 手术时长、麻醉时长
- ▶ 术后卧床时间
- ▶ 术中、术后是否输血

Subjects	DVT	Non DVT	DVT incidence (%)	p-value
Age (years)				<0.001
<50	9	414	2.13	
≥50	59	257	18.67	
BMI (Kg/m ²)				0.022
<25	34	430	7.32	
≥25	34	241	12.36	
Varicose vein				0.004
No	61	653	8.54	
Yes	7	17	29.17	
Hypertension				<0.001
No	40	563	6.63	
Yes	28	18	60.87	
Malignancy				<0.001
No	28	563	4.73	
Yes	40	108	27.03	
Laparotomy procedure				<0.001
No	18	435	3.97	
Yes	50	236	17.48	
Transfusion				<0.001
No	58	649	8.20	
Yes	10	22	31.25	
Length of operation ≥3h				<0.001
No	24	517	4.44	
Yes	44	154	22.22	
Length of postoperative immobility ≥10h				<0.001
No	26	486	5.08	
Yes	42	185	18.50	
Bed rest time ≥48h				<0.001
No	28	573	4.66	
Yes	40	98	28.99	



Variables	OR	95%CI	p-value
Varicose vein			0.004
No	1		
Yes	4.64	1.61-13.37	
Bed rest time ≥48h			<0.001
No	1		
Yes	3.94	2.12-7.30	
Length of operation ≥3h			<0.001
No	1		
Yes	3.31	1.83-6.01	
Laparotomy procedure			0.003
No	1		
Yes	2.56	1.38-4.78	
Hypertension			0.017
No	1		
Yes	2.13	1.15-3.97	
Age ≥50			0.021
No	1		
Yes	2.10	1.12-3.94	

盆腔术后血栓发生的危险因素

- ▶ 静脉曲张
- ▶ 术后卧床时间 ≥ 48 小时
- ▶ 手术时间 ≥ 3 小时
- ▶ 开腹手术
- ▶ 高血压
- ▶ 年龄 ≥ 50 岁

危险分级	危险因素数目	术后 DVT 发生率 (%)	OR	95%CI
	0	0.43	1	
低危	1	3.31	7.89	0.94-66.10
中危	2	5.36	21.91	2.85-168.34
高危	≥3	28.31	90.84	12.38-666.56

该预测模型的优势

- ▶ 可以达到相同甚至更为准确的术后DVT发生率预测效果
- ▶ 主要针对妇科盆腔手术后患者，纳入了更多可能导致血栓形成的危险因素
- ▶ 针对中国人群进行的研究，更符合我国妇女疾病及妇科手术特点

建议

- ▶ 术后一周是下肢DVT发生的高危时期
- ▶ 术后2-5天是早期筛查的最佳时机
- ▶ 对于中危及以上患者建议进行术后筛查
- ▶ 对于有2个以上危险因素的患者建议进行药物或机械预防



谢 谢