

# Jane Smith

- 49 year old nurse
- Uneventful laprascopic vaginal hysterectomy lasting approximately 65 minutes under general anesthesia
- Healthy individual, with previous vein stripping surgery
- Takes HRT and OTC medications for “aches & pains” associated with running
- She recently completed the Calgary Policeman’s Half Marathon

# Why is DVT Prophylaxis Important?

600,000

200,000

Prevention of Venous Thromboembolism. Seventh ACCP Conference on Antithrombotic Therapy, CHEST. 2004





# DVT Prevalence in Surgery Patients

<b>General Surgery</b>	<b>15 - 40 %</b>
<b>Gynecological and Urological Surgery</b>	<b>15 - 40 %</b>
<b>Hip Surgery</b>	<b>40 - 60 %</b>
<b>Knee Reconstruction</b>	<b>40 - 60%</b>
<b>Multi-System / Major Trauma</b>	<b>40 - 80 %</b>
<b>Neurosurgery</b>	<b>15 - 40 %</b>

Prevention of Venous Thromboembolism. Geerts WH, Bergqvist D, Pineo G, et al. American College of Chest Physicians Evidence-Based, CHEST. 2008



# The Silent Killer

The majority of PE's are asymptomatic

81%

D.A. Sandler et al. autopsy proven PE in hospital patients: Are we detecting enough DVT? Journal of Royal Society of Medicine 1989, Vol 82.



# Who is at Risk ?

Major Surgery  
Trauma  
Cancer and cancer Rx  
Stroke or paralysis  
Previous VTE  
Thrombophilia  
Mechanical ventilation  
Spinal chord injury

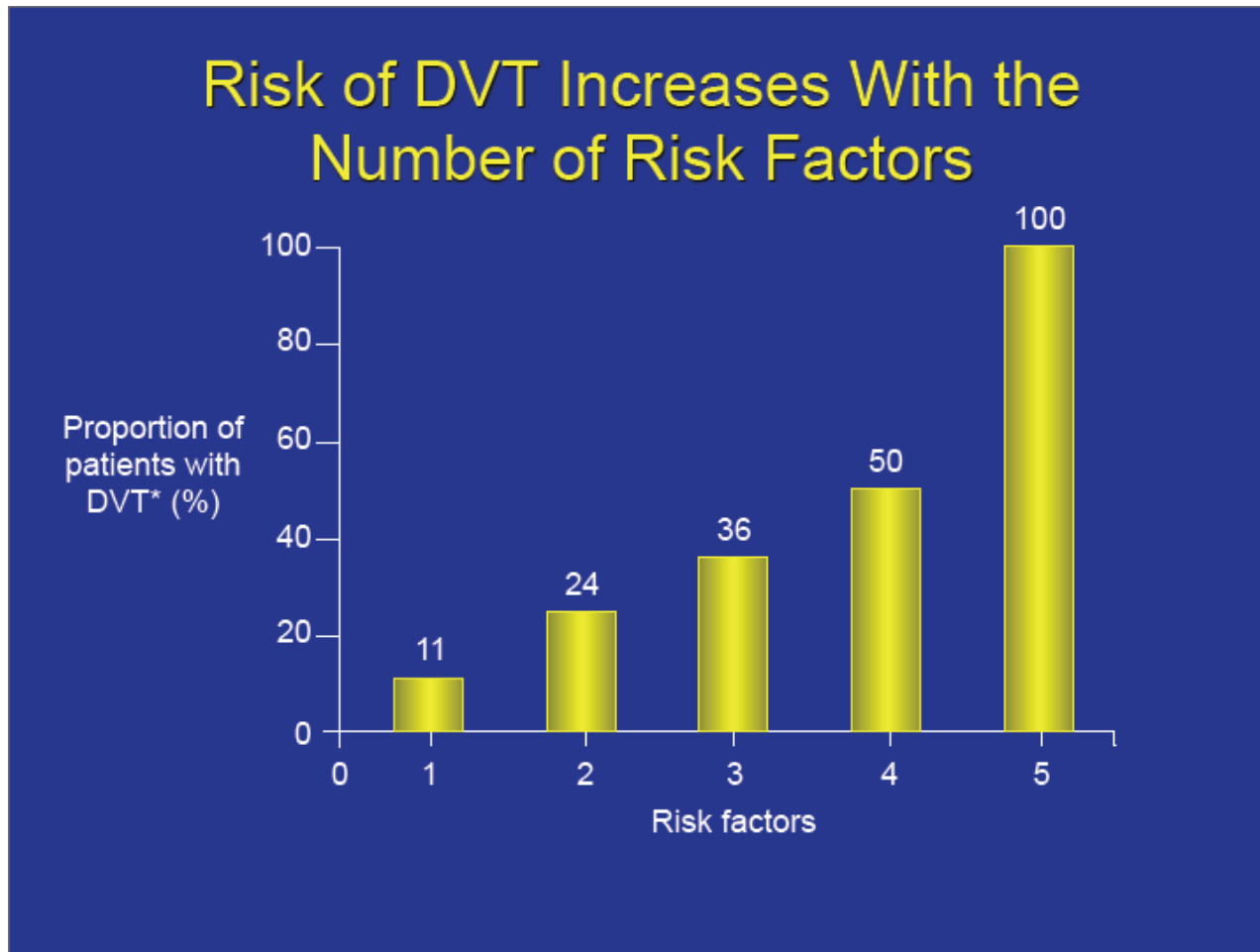


Increased age  
Immobilization  
Severe respiratory disease  
Systemic infection  
Congestive Heart Failure  
Estrogen use  
Pregnancy & postpartum  
Inflammatory Bowel Disease  
Nephrotic Syndrome  
Obesity  
General anesthesia > 1 hour  
Varicose Veins  
Collagen Vascular Disease

Almost ALL patients in hospital have at least ONE risk factor for VTE



# More Risk Factors = Higher Risk of DVT



Monday, May 10, 2010

Anderson FA Jr et al, Circulation 2003, 107:1-9-1-16





# Give LMWH To Everyone Not At Risk For Bleeding (no need to assess risk)

**WAIT A MINUTE--NOT SO FAST**

- **Average risk** patients can receive the standard prophylaxis based on the evidence-based group guidelines.
- **Below average risk** patients can avoid anticoagulants since IPC is effective and avoids bleeding and HIT complications **APOLLO Study – 5.3% venographic incidence- IPC alone**
- **Very High risk** patients should receive combined modalities which have greater efficacy than the single modality used for the group (**average 1.5%**)
- **Using anticoagulants alone results in a 5-8% VTE incidence.**
  - Don't forget -- these very high risk patients are often excluded from clinical trials.

Caprini, J.A, Risk Assessment for Thrombosis Prophylaxis –  
Calgary, October 28<sup>th</sup> 2008

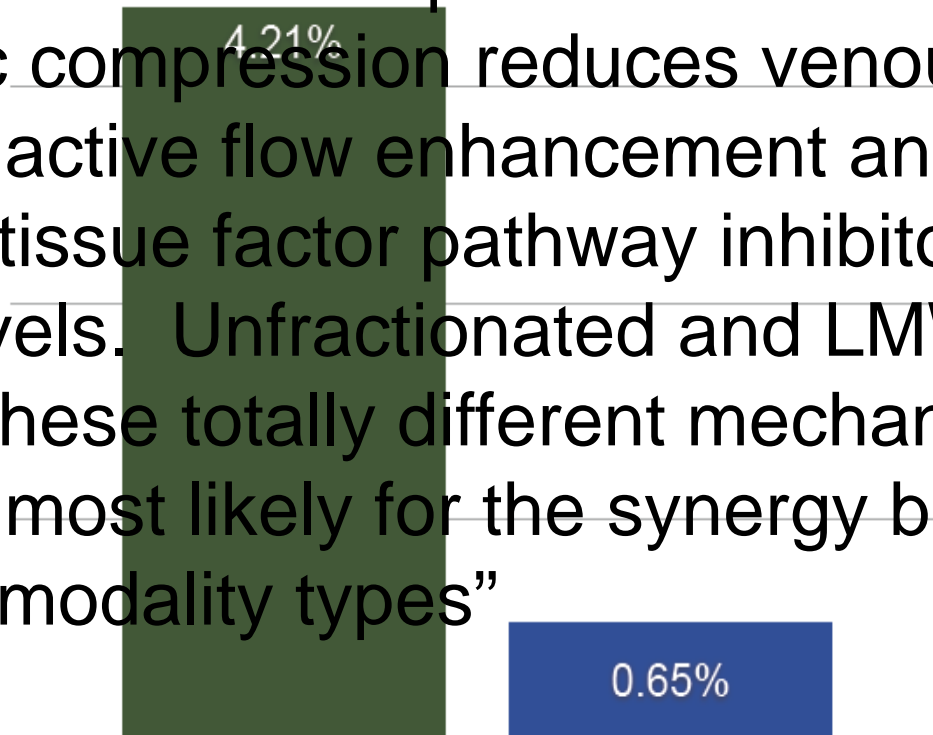




# What does the Cochrane Library say?

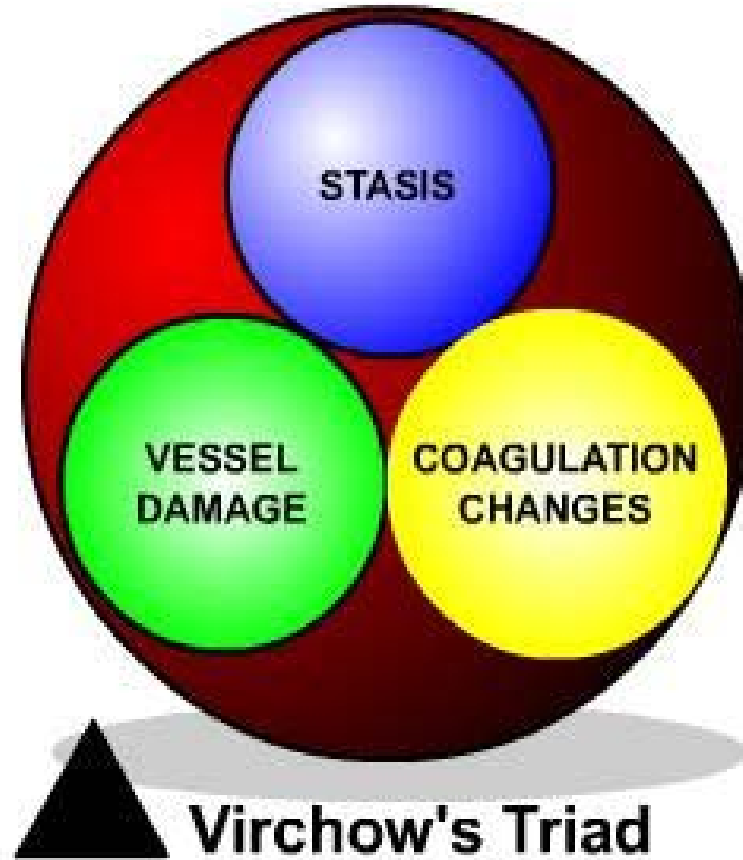
## Incidence of DVT

“DVT is a multifactorial process...Intermittent Pneumatic compression reduces venous stasis by producing active flow enhancement and also increases tissue factor pathway inhibitor (TFPI) plasma levels. Unfractionated and LMWH inhibit factor X. These totally different mechanisms of action are most likely for the synergy between these two modality types”



Kakkos et al, Cochrane Library 2008 issue 4. Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of VTE in high-risk patients.

# How Compression Fights DVT



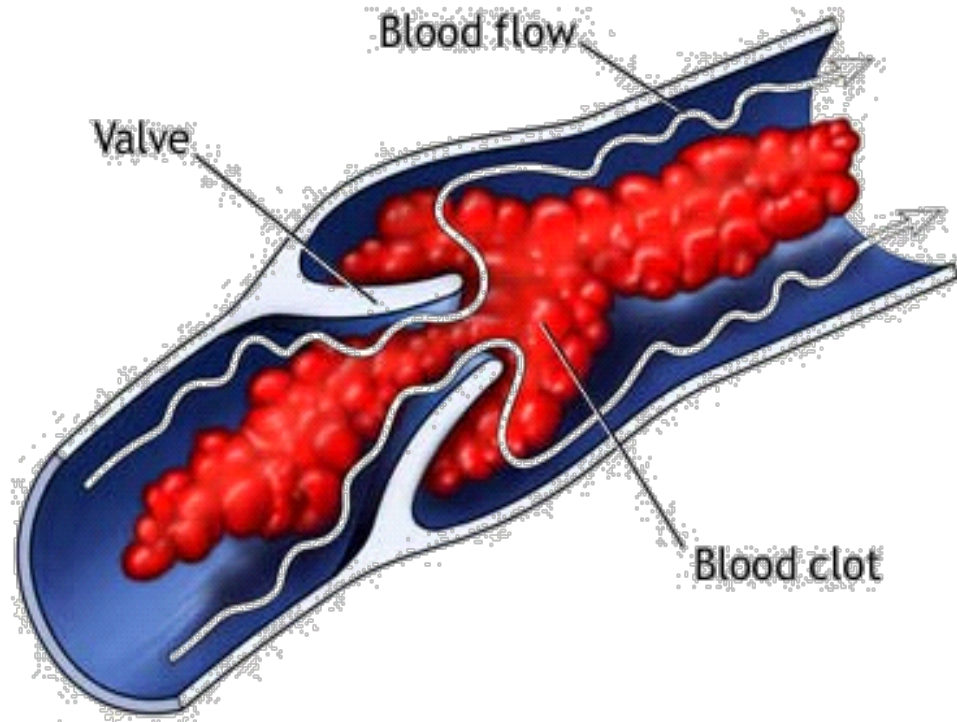
# How Compression Fights DVT

## Virchow's Triad

<b>Stasis</b>	<b>Vessel Wall Damage</b>	<b>Coagulation Changes</b>
Intermittent Pneumatic Compression		Intermittent Pneumatic Compression
Graduated Compression Stockings	Graduated Compression Stockings	Pharmacological Modalities

**Where do you think  
the majority of clots form?**

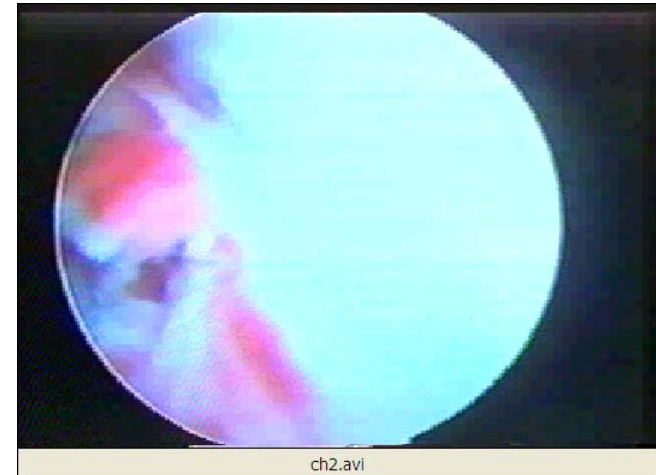
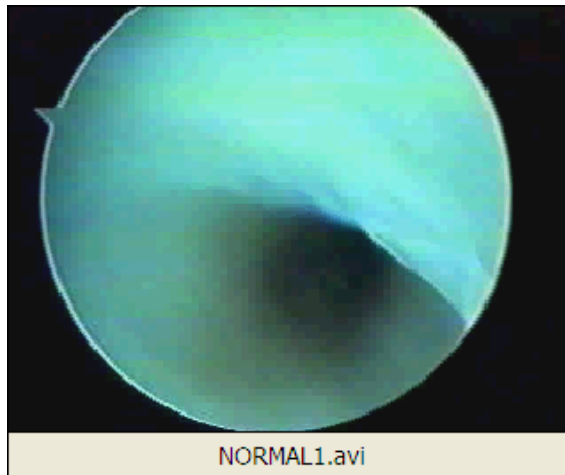
“By far the most common site of origin...  
was the valve cusp or wall of the femoral vein”



**Stamatakis et al, British Medical Journal**



# Venous Valve Clot – A closer Look?



Janssen. H.F, Ph.D Texas Tech University Health Science  
Center, Lubbock, Texas

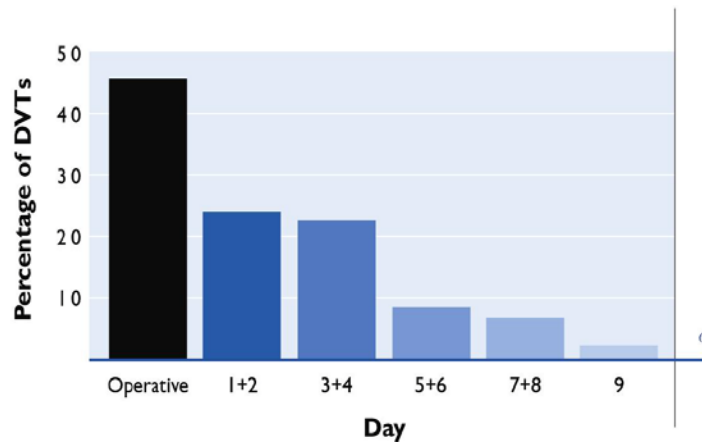


**When do you think  
the majority of clots form?**





# Within 24 hours of surgery



“45% of the thrombi occurred on the day of operation.”

Nicolaides, A.N. & Gordan-Smith, I.A. Rational Approach to Prevention. THROMBOEMBOLISM, AETIOLOGY, ADVANCES IN PREVENTION AND MANAGEMENT, Medical and Technical Publishing Co. Ltd. 1975

Way out ↗

NO SMOKING

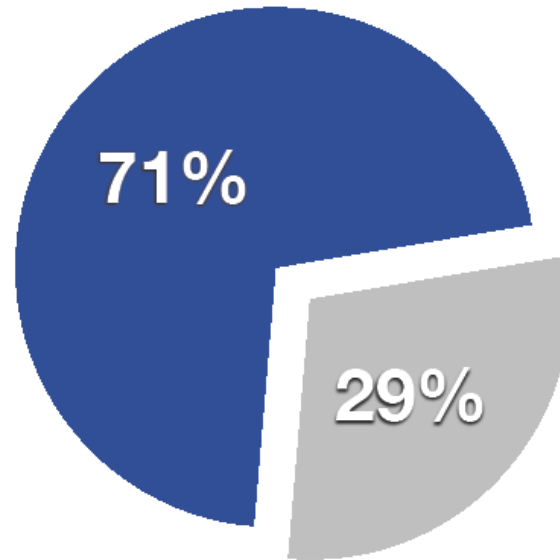


Metropolitan line



# DVT Free Registry

**Prophylaxis is underutilized!**



S.Z. Goldhaber, American Journal of Cardiology, 2004, 93,  
259-262



# Surgical Safety Checklist



## CHECKLIST & SCORECARD

www.safesurgerysaveslives.ca

Your  
Organizational  
Logo

### BRIEFING – Before induction of anesthesia

#### Hand-off from ER, Nursing Unit or ICU

- Anesthesia equipment safety check completed
- Patient information confirmed
  - Identity (2 identifiers)
  - Consent(s)
  - Site and procedure
  - Site, side and level marked
  - Clinical documentation
  - History, physical, labs, biopsy and x-rays
- Review final test results
- Confirm essential imaging displayed
- ASA Class
- Allergies
- Medications
  - Antibiotic prophylaxis: double dose?
  - Glycemic control
  - Beta blockers
  - Anticoagulation therapy (e.g., Warfarin)?
- VTE Prophylaxis
  - Anticoagulant
  - Mechanical
- Difficult Airway / Aspiration Risk
  - Confirm equipment and assistance available
- Monitoring
  - Pulse oximetry, ECG, BP, arterial line, CVP, temperature and urine catheter
- Blood loss
  - Anticipated to be more than 500 ml (adult) or more than 7 ml/kg (child)
  - Blood products required and available
  - Patient grouped, screened and cross matched

### BRIEFING (continued)

- Surgeon(s) review(s)
  - Specific patient concerns, critical steps, and special instruments or implants
- Anesthesiologist(s) review(s)
  - Specific patient concerns and critical resuscitation plans
- Nurses(s) review(s)
  - Specific patient concerns, sterility indicator results and equipment / implant issues
- Patient positioning and support / Warming devices
- Special precautions
- Expected procedure time / Postoperative destination

### TIME OUT – Before skin incision

- All team members introduce themselves by name and role
- Surgeon, Anesthesiologist, and Nurse verbally confirm
  - Patient
  - Site, side and level
  - Procedure
  - Antibiotic prophylaxis: repeat dose?
  - Final optimal positioning of patient
- “Does anyone have any other questions or concerns before proceeding?”

### DEBRIEFING – Before patient leaves OR

- Surgeon reviews with entire team
  - Procedure
  - Important intra-operative events
  - Fluid balance / management
- Anesthesiologist reviews with entire team
  - Important intra-operative events
  - Recovery plans (including postoperative ventilation, pain management, glucose and temperature)
- Nurse(s) review(s) with entire team
  - Instrument / sponge / needle counts
  - Specimen labeling and management
  - Important intraoperative events (including equipment malfunction)
- Changes to post-operative destination?
- What are the KEY concerns for this patient’s recovery and management?
- Could anything have been done to make this case safer or more efficient?

#### Hand-off to PACU / RR, Nursing Unit or ICU

### CHECKLIST SCORE

Add all checkmarks for 3 sections and enter below

Briefing \_\_\_\_\_ /17 = \_\_\_\_\_  
 Time Out \_\_\_\_\_ /3 = \_\_\_\_\_  
 Debriefing \_\_\_\_\_ /6 = \_\_\_\_\_  
 TOTAL \_\_\_\_\_ /26 = \_\_\_\_\_ x 100 = \_\_\_\_\_

### PATIENT INFORMATION

Adapted from the WHO Surgical Safety Checklist. © World Health Organization. 2008

Surgical Safety Checklist: Canada

