

# Sport et MTEV

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# MTEV chez le sportif



**S Williams**

(post trauma)

COP?



**A Duchemin**

# Dr, pourquoi?



**S Williams**

(post trauma)

COP?

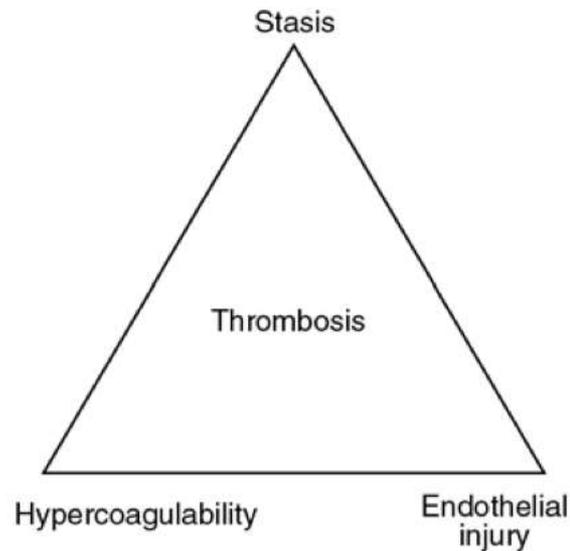


**A Duchemin**

# Venous Thrombosis in Athletes

## Acquired Risk Factors

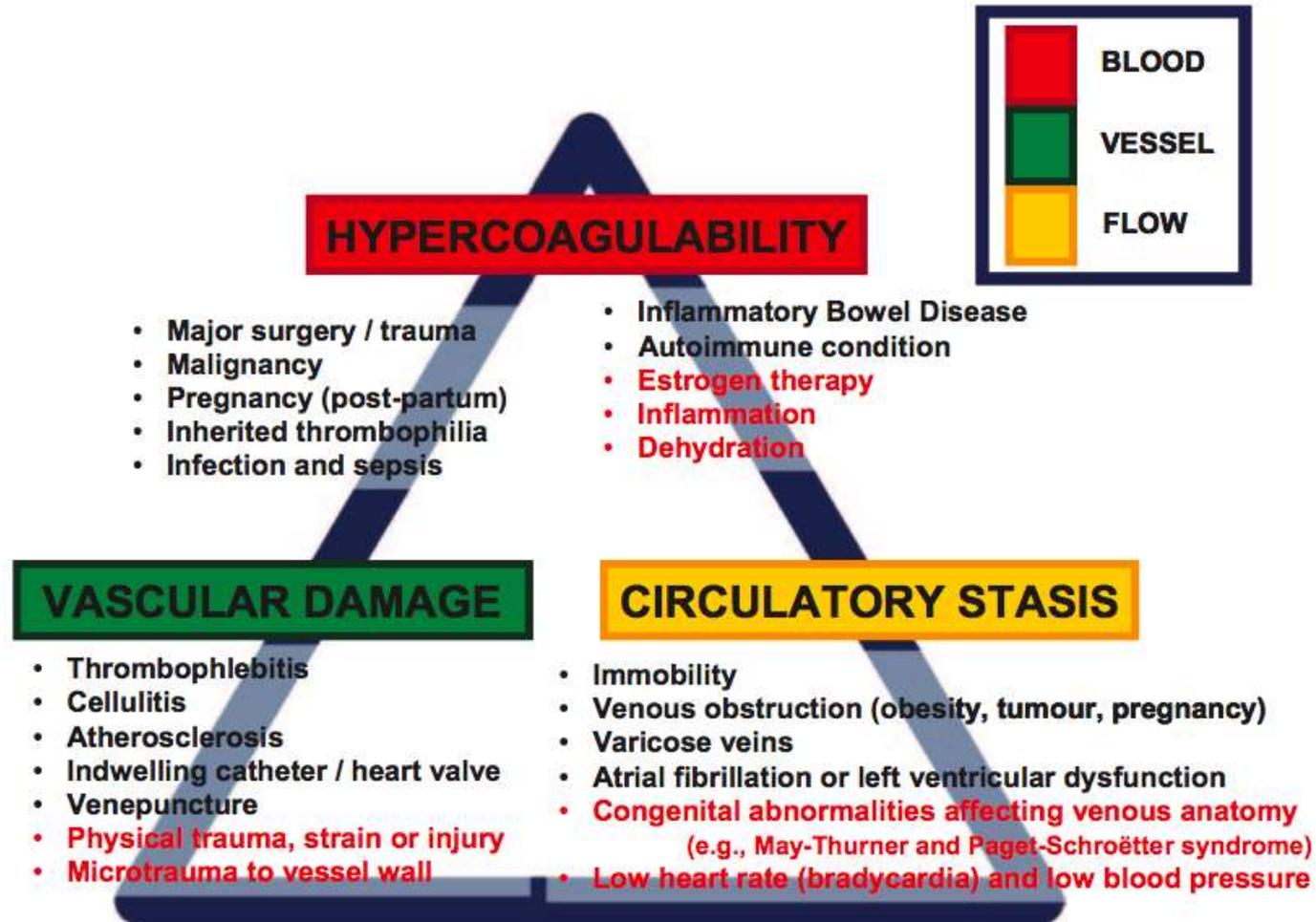
Figure 1



Acquired risk factors for thrombosis in the athlete include hemoconcentration, which is most commonly due to dehydration; trauma; immobilization after injury; long-distance travel; blood hyperviscosity; and, in female athletes, the use of oral contraceptives.<sup>1,27</sup> Although the role

# Multiple pulmonary embolisms in a male marathon athlete: Is intense endurance exercise a real thrombogenic risk?

Sanz de la Garza, Scand J Med Sci Sports 2016



# Deep Vein Thrombosis and Pulmonary Embolism in a Mountain Guide: Awareness, Diagnostic Challenges, and Management Considerations at Altitude

## HYPERCOAGULABILITY

- Major surgery / trauma
- Malignancy
- Pregnancy (post-partum)
- Inherited thrombophilia
- Infection and sepsis
- Extremely cold temperature
- High altitude :  
hypoxia & elevated hematocrit
- Inflammatory Bowel Disease
- Nephrotic syndrome
- Oestrogen contraceptives
- Inflammation
- Heat stress, electrolyte imbalance & dehydration
- Autoimmune conditions
- Psychological stressors:  
(avalanche risk, competition sport)
- Changes in blood physiology  
after physical exercise

## VASCULAR DAMAGE

- Thrombophlebitis
- Cellulitis
- Atherosclerosis & Heart Disease
- Indwelling catheter or heart valve
- Venepuncture
- Physical trauma, strain or injury  
(occupational, sports & training)



## CIRCULATORY STASIS

- Immobility or enforced inactivity (e.g., adverse weather)
- Blood pooling in lower limbs whilst seated (e.g., driving car) or during long-distance travel (e.g., flights & coach journeys)
- Venous obstruction or restriction (e.g., pressure on popliteal vein when seated)
- Varicose veins
- Vasoconstriction for thermoregulation
- Atrial fibrillation
- Left ventricular dysfunction
- Bradycardia & hypotension (high cardiopulmonary fitness)
- Congenital structural malformations

## Cerebral Venous Thrombosis (CVT)

- Headache (†, ✕)
- Seizures and obscured vision (✕)
- Changes in mental status; depressed level of consciousness (#, ‡, ○, ✕)
- Symptoms of stroke: inability to move one or more limbs, weakness on one side of the face or difficulty speaking (#, ○)
- Nausea and vomiting (†, #, ‡, ○, ✕)

## Pulmonary Embolism

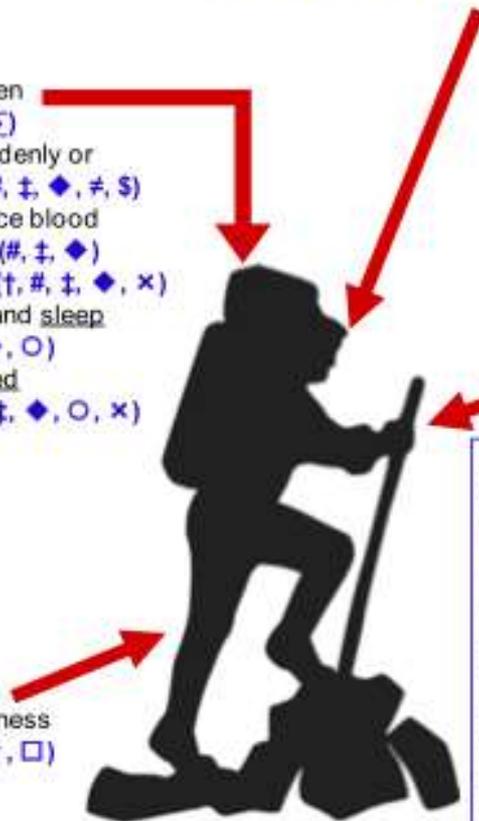
- Chest pain: sharp and stabbing, often worse upon deep inhalation (●, ≠, Σ)
- Shortness of breath – occurring suddenly or developing gradually (#, ‡, ◆, ≠, \$)
- Coughing: often dry, but may produce blood or mucus containing blood (#, ‡, ◆)
- Feeling faint, dizzy or passing out (†, #, ‡, ◆, ✕)
- Fever and rapid heart rate; anxiety and sleep disturbance (#, ‡, ◆, ○)
- Generally feeling unwell or exhausted (#, ‡, ◆, ○, ✕)

## Lower Extremity Deep Vein Thrombosis

- Pain, cramping, swelling and tenderness in one leg (often calf or ankle) (◇, ★, □)
- Heavy ache in the affected area
- Warm skin in the area of the clot
- Redness of your skin, especially at the back of the leg below the knee (◇, ★, □)

## Upper Extremity Deep Vein Thrombosis

- Shoulder and / or neck discomfort (◇, ★, □)
- Pain radiating to arm / forearm; hand weakness (★, ≡)
- Supraclavicular fullness and palpable cord
- Fever due to thrombus formation (◆)
- Edema of the arm and hand
- Mild-to-moderate cyanosis of the hand (□, ≡, ≠)
- Dilated superficial collateral veins over chest and upper arm
- Distended jugular vein



## Potential differential diagnoses (and indicative symptoms)

### At altitude:

- **HAH:** High altitude headache (†)
- **AMS:** Acute mountain sickness (#)
- **HAPE:** High altitude pulmonary edema (‡)
- **HACE:** High altitude cerebral edema (○)
- Pneumonia, chest infection (e.g., bronchitis) (◆)
- Pleurisy (Σ)
- Pneumothorax (≠)
- Frostbite (≡)

### Mountain and other sports (general):

- Carpal Tunnel and repetitive strain injuries (★)
- Muscular skeletal injuries including tendonitis (□)
- Venous damage and microtrauma (◇)
- Cracked, broken and/or bruised rib/s (●)
- **EIA:** Exercise induced asthma (\$)
- **EAH:** Exercise-associated hyponatremia (✕)

# Dr, puis je refaire du sport?



**S Williams**

(post trauma)

COP?



**A Duchemin**

# INCREASING DYNAMIC COMPONENT

**STATIC COMPONENT**  
  
**III. High (>50% MVC)**  
**II. Moderate (20-50% MVC)**

|                                  | <b>A. Low (&lt; 40% Max O<sub>2</sub>)</b>   | <b>B. Moderate (40-70% Max O<sub>2</sub>)</b>  | <b>C. High (&gt; 70% Max O<sub>2</sub>)</b>   |
|----------------------------------|--|--|---|
| <b>III. High (&gt;50% MVC)</b>   | <p><b>IIIA (Moderate)</b><br/>                     Bobsledding/luge<sup>a,b</sup><br/>                     Field events (throwing)<br/>                     Gymnastics<sup>a,b</sup><br/>                     Martial arts<sup>a</sup><br/>                     Sailing<br/>                     Sport climbing<br/>                     Water skiing<sup>a,b</sup><br/>                     Weight lifting<sup>a,b</sup><br/>                     Windsurfing<sup>a,b</sup></p> | <p><b>IIIB (High Moderate)</b><br/>                     Body building<sup>a,b</sup><br/>                     Downhill skiing<sup>a,b</sup><br/>                     Skateboarding<sup>a,b</sup><br/>                     Snowboarding<sup>a,b</sup><br/>                     Wrestling<sup>a</sup></p>   | <p><b>IIIC (High)</b><br/>                     Boxing<sup>a,c</sup><br/>                     Canoeing/kayaking<br/>                     Cycling<sup>a,b</sup><br/>                     Decathlon<br/>                     Rowing<br/>                     Speed-skating<sup>a,b</sup><br/>                     Triathlon<sup>a,b</sup></p>                                    |
| <b>II. Moderate (20-50% MVC)</b> | <p><b>IIA (Low Moderate)</b><br/>                     Archery<br/>                     Auto racing<sup>a,b</sup><br/>                     Diving<sup>a,b</sup><br/>                     Equestrian<sup>a,b</sup><br/>                     Motorcycling<sup>a,b</sup></p>   | <p><b>IIB (Moderate)</b><br/>                     American football<sup>a</sup><br/>                     Field events (jumping)<br/>                     Figure skating<sup>a</sup><br/>                     Rodeoing<sup>a,b</sup><br/>                     Rugby<sup>a</sup><br/>                     Running (sprint)<br/>                     Surfing<sup>a,b</sup><br/>                     Synchronized swimming<sup>b</sup></p> | <p><b>IIC (High Moderate)</b><br/>                     Basketball<sup>a</sup><br/>                     Ice hockey<sup>a</sup><br/>                     Cross-country skiing (skating technique)<br/>                     Lacrosse<sup>a</sup><br/>                     Running (middle distance)<br/>                     Swimming<br/>                     Team handball</p> |

# Et le traitement anticoagulant?



<https://www.youtube.com/watch?v=V48qAfjQPv4>

**TABLE 1 Classification of Sports According to Contact**

| Contact                     | Limited-Contact                       | Noncontact                           |
|-----------------------------|---------------------------------------|--------------------------------------|
| Basketball                  | Adventure racing <sup>a</sup>         | Badminton                            |
| Boxing <sup>b</sup>         | Baseball                              | Bodybuilding <sup>c</sup>            |
| Cheerleading                | Bicycling                             | Bowling                              |
| Diving                      | Canoeing or kayaking<br>(white water) | Canoeing or kayaking<br>(flat water) |
| Extreme sports <sup>d</sup> | Fencing                               | Crew or rowing                       |
| Field hockey                | Field events                          | Curling                              |
| Football, tackle            | High jump                             | Dance                                |
| Gymnastics                  | Ice skating                           | Figure skating                       |
| Ice hockey <sup>e</sup>     | Floor hockey                          | Discus                               |
| Lacrosse                    | Football, flag or touch               | Javelin                              |
| Martial arts <sup>f</sup>   | Handball                              | Shot-put                             |
| Rodeo                       | Horseback riding                      | Golf                                 |
| Rugby                       | Martial arts <sup>f</sup>             | Orienteering <sup>g</sup>            |
| Skiing, downhill            | Racquetball                           | Power lifting <sup>c</sup>           |
| Ski jumping                 | Skating                               | Race walking                         |
| Snowboarding                | Ice                                   | Riflery                              |
| Soccer                      | In-line                               | Rope jumping                         |
| Team handball               | Roller                                | Running                              |
| Ultimate Frisbee            | Skiing                                | Sailing                              |
| Water polo                  | Cross-country                         | Scuba diving                         |
| Wrestling                   | Water                                 | Swimming                             |
|                             | Skateboarding                         | Table tennis                         |
|                             | Softball                              | Tennis                               |
|                             | Squash                                | Track                                |

**Participation in non-contact sports is safe without interruption of anticoagulation, but participation in limited contact, contact and collision sports while on anticoagulation has historically been regarded as impossible**

## **Athletes and blood clots: individualized, intermittent anticoagulation management**

A gradual return to non-contact athletic activity has been proposed, starting after 3 weeks with resumption of full participation as soon as 6 weeks, even while the patient is anticoagulated [2,6]. Yet for contact sport athletes requiring anticoagulation, return to play has not been considered at any point during treatment, and scientific and public discussion is lacking.

- L'effet on/off immédiat des AOD pourrait changer fondamentalement la gestions des anticoagulants chez les athlètes:
  - Étude PK/PD pour prédire l'arrêt
  - Reprise 1 – 2h après si absence de trauma



**Fédération Française**  
**d'Études et de Sports**  
**Sous-Marins**



www.**FFESSM**.fr  
**COMMISSION**  
**Médicale et**  
**de Prévention**

## 4 – Traitement par les AVK

Ce traitement par lui même n'est pas une contre indication à la plongée si l'INR est équilibré (entre 2 et 3) ; il faut cependant se référer à la maladie qui a provoqué la prescription d'AVK : est-elle oui ou non une CI à la plongée ?

# Thanks

