

Hyper & Hypo Coagulability

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GUNDERSEN HEALTH SYSTEM

Who should get mechanical or chemoprophylaxis

This is sadly frustrating,,,,,,

Very limited guidance and this is really individualized

American College of Chest Physicians

Created a guideline but doesn't include OTO/HNS in surgery specific

American Head and Neck Society

ENT.UK risk assessment but not very evidence based

AHNS Series: Do you know your guidelines? Perioperative antithrombotic management in head and neck surgery

Annika Meyer MD, Neil Gross MD, Marita Teng MD

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Citations: 4

This article continues a series developed by the American Head and Neck Society's Education Committee entitled "Do you know your guidelines?" and is intended to help physicians navigate the challenge of antithrombotic management in head and neck surgery.

Antithrombotic Therapy for Venous Thromboembolism and Prevention of Thrombosis in Otolaryngology-Head and Neck Surgery: State of the Art Review

Correction(s) for this article

John D. Cramer MD, Andrew G. Shuman MD, Michael J. Brenner MD

First published: 27 February 2018

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Citations: 3

Use of preoperative services

Do you have access to preoperative clinic/anticoagulation coordination?

Strongly encourage discussion with primary care provider if not available or hematology depending on the situation

Venous Thromboembolism

Encompasses DVT/PE

Rate is 1-1.8/1000 of general population

150,000-200,000 deaths/year

- 1/3 of these are postop
 - VTE occurs at a 150 fold greater rate for hospitalized vs outpatient surgery

Risk of recurrence/propagation/embolization > over first 2 months

- Therefore initial treatment x 3 months
- Risk of recurrent VTE
 - is low if initial event provoked by surgery
 - Is high if unprovoked/thrombophilia/cancer
 - Nonsevere risk is thrombophilia/heterozygous factor V(lifetime risk is <10%)
 - High risk seen with def of protein C-S or antithrombin,homozygous factor V(25-50 x risk of developing vs general pop)

Incidence in OTO/HNS

Studies report wide range or rates

- Meta-analysis of 23 studies incidence at about 0.4%
 - We have to remember that we have a broad patient population
 - Fault of this data is it really didn't take into account outpatient vs inpatient/and not done with risk stratification
- A prospective study by Clayburgh et al looked at patients with Caprini >5 having “major head and neck surgery-80% had free tissue”, patients had “scant” use of chemoprophylaxis
 - Did universal lower extremity duplex US of 100 patients> 13% rate of VTE
- Risk factors
 - Age,cancer,prior VTE, family hx of VTE, prothrombotic predisposition, central venous access, sepsis, pregnancy and a inpatient stay of >2 days.

Caprini VTE Risk Stratification

Uses 40 preoperative characteristics to create overall risk score

This has been validated in 5 studies in OHNS populations

- ≥ 8 have 10-33% chance of VTE without prophylaxis
- < 6 have 0-0.5%

Note these are guidelines for OHNS as rates are lower than other surgical specialties with similar scores

- One short coming is surgery length by Caprini is scored at 45 min time stop
- Doesn't take into account tissue harvest which may result in immobility.
- Ironically,,,,, avoiding paralyzing agents may lessen risk of paralysis

Caprini Risk Assessment Model

<p>Add 1 point for each of the following statements that apply now or within the past month:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Age 41– 60 years _____ <input type="checkbox"/> Minor surgery (less than 45 minutes) is planned _____ <input type="checkbox"/> Past major surgery (more than 45 minutes) within the last month _____ <input type="checkbox"/> Visible varicose veins _____ <input type="checkbox"/> A history of Inflammatory Bowel Disease (IBD) (for example, Crohn's disease or ulcerative colitis) _____ <input type="checkbox"/> Swollen legs (current) _____ <input type="checkbox"/> Overweight or obese (Body Mass Index above 25) _____ <input type="checkbox"/> Heart attack _____ <input type="checkbox"/> Congestive heart failure _____ <input type="checkbox"/> Serious infection (for example, pneumonia) _____ <input type="checkbox"/> Lung disease (for example, emphysema or COPD) _____ <input type="checkbox"/> On bed rest or restricted mobility, including a removable leg brace for less than 72 hours _____ <input type="checkbox"/> Other risk factors (1 point each)** _____ <p><small>***Additional risk factors not tested in the validation studies but shown in the literature to be associated with thrombosis include BMI above 40, smoking, diabetes requiring insulin, chemotherapy, blood transfusions, and length of surgery over 2 hours.</small></p>	<p>Add 2 points for each of the following statements that apply:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Age 61–74 years _____ <input type="checkbox"/> Current or past malignancies (excluding skin cancer, but not melanoma) _____ <input type="checkbox"/> Planned major surgery lasting longer than 45 minutes (including laparoscopic and arthroscopic) _____ <input type="checkbox"/> Non-removable plaster cast or mold that has kept you from moving your leg within the last month _____ <input type="checkbox"/> Tube in blood vessel in neck or chest that delivers blood or medicine directly to heart within the last month (also called central venous access, PICC line, or port) _____ <input type="checkbox"/> Confined to a bed for 72 hours or more _____
<p>For women only: Add 1 point for each of the following statements that apply:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Current use of birth control or Hormone Replacement Therapy (HRT) _____ <input type="checkbox"/> Pregnant or had a baby within the last month _____ <input type="checkbox"/> History of unexplained stillborn infant, recurrent spontaneous abortion (more than 3), premature birth with toxemia or growth restricted infant. _____ 	<p>Add 3 points for each of the following statements that apply:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Age 75 or over _____ <input type="checkbox"/> History of blood clots, either Deep Vein Thrombosis (DVT) or Pulmonary Embolism (PE) _____ <input type="checkbox"/> Family history of blood clots (thrombosis) _____ <input type="checkbox"/> Personal or family history of positive blood test indicating an increased risk of blood clotting _____ <p>Add 5 points for each of the following statements that apply now or within the past month:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Elective hip or knee joint replacement surgery _____ <input type="checkbox"/> Broken hip, pelvis or leg _____ <input type="checkbox"/> Serious trauma (for example, multiple broken bones due to a fall or car accident) _____ <input type="checkbox"/> Spinal cord injury resulting in paralysis _____ <input type="checkbox"/> Experienced a stroke _____

Cancer as a Risk factory

Upper aerodigestive track cancers have 11-fold greater rate of VTE vs Thyroid malignancy (actually less than those with skin malignancy as well)

- Cramer et al JAMA Otolaryngol Head and Neck Surg doi:10.1001/jamaoto.2017.1768

Mechanical Prophylaxis

Sequential Compression Devices

- Reduce the risk of DVT by 50%

Elastic Stockings

- “effective at reducing risk of VTE”
- Not as good as SCD
 - Skin complications and incidence of VTE

There are no studies examining risk in OTO/HNS patients

Chemoprophylaxis

No prospective studies in OTO/HNS patients

One retrospective study

- No difference if received or not if not assessing for risk
- If Caprini > 7
 - Received chemoprophylaxis 5.3%
 - No prophylaxis 10.4%

No studies have looked at timing either initiating or duration

- Plastics literature suggests initiating 6-8 hours after surgery

Risks of chemoprophylaxis

- Bahl et al found bleeding 3.5% vs 1.2%, with free tissue 11.9% vs 4.5% without

VTE that progresses to PE may be FATAL in 30% of patients

HYPO COAGULABILITY

Medication	Mechanism of action	When to stop preoperatively	When to restart postoperatively
Anticoagulants			
Warfarin (Coumadin)	Vitamin K antagonist; inhibits factors II, VII, IX, and X, protein C, and protein S	4-5 d, when INR \leq 1.5	12-24 h
Unfractionated heparin	Activation of antithrombin; inhibits factors IIa, IXa, Xa, XIa, and XIIa	4-6 h (i.v.) 8-12 h (s.c.)	12-24 h
LMWH (enoxaparin, Lovenox, dalteparin, Fragmin)	Activation of antithrombin; inhibits factor Xa	24 h	1-3 d
Fondaparinux (Arixtra)	Activation of antithrombin; factor Xa inhibitor	36-42 h	6-24 h
Dabigatran (Pradaxa)	Direct thrombin inhibitor	1-3 d a	1-3 d
Rivaroxaban (Xarelto)	Direct factor Xa inhibitor	1-3 d a	1-3 d
Apixaban (Eliquis)	Direct factor Xa inhibitor	1-2 d a	1-3 d
Edoxaban (Savaysa)	Direct factor Xa inhibitor	1-3 d	1-3 d
Argatroban (Acova)	Direct factor Xa inhibitor	4 h	1-3 d
Desirudin (Iprivask)	Direct thrombin inhibitor	10 h	2-3 d
Bivalirudin (Angiomax)	Direct thrombin inhibitor	2-4 h	2-3 d
Antiplatelets			
Aspirin	Cyclooxygenase inhibitor	Continue, or 7-10 d	Continue, or 12-24 h
Aspirin and dipyridamole (Aggrenox)	Cyclooxygenase inhibitor, phosphodiesterase inhibitor	7-10 d	24 h
Cilostazol (Pletal)	Phosphodiesterase inhibitor	2 d	24 h
Clopidogrel (Plavix), prasugrel (Effient), ticagrelor (Brilinta)	ADP receptor inhibitor	5-7 d	24 h
Ticlopidine (Ticlid)	ADP receptor inhibitor	7-10 d	24 h

Terminology

CHA₂DS₂-VASc score

- is the recommended predictor tool for estimating the risk of stroke in nonanticoagulated patients with nonvalvular AF

Table 2. Definition, scores, and estimated stroke rate per year for CHA₂DS₂-VASc

Definition and scores for CHA ₂ DS ₂ -VASc	Points	Score	Adjusted stroke rate, % per year
CHF	1	1	1.3
Hypertension	1	2	2.2
Age ≥75 y	2	3	3.2
Diabetes mellitus	1	4	4.0
Stroke/TIA/TE	2	5	6.7
Vascular disease	1	6	9.8
Age 65-74 y	1	7	9.6
Female	1	8	6.7
Maximum score	9	9	15.2

Abbreviations: CHF, congestive heart failure; TE, thromboembolism; TIA, transient ischemic attack.

This table was adapted from January et al² and republished with permission from Elsevier.

Types of anticoagulants

P2Y₁₂ receptor inhibitor

- Clopidogrel(Plavix), prasugrel or ticagrel
- Use at least x 1 month for bare metal stents and 3-12 months after drug eluting stents

Mechanical Heart Valves

Depends on multiple variables

- Type/number/location /comorbidities/heart failure/arrhythmias/hx of thromboembolism

Coronary Stents

ASA should almost always be continued indefinitely

Dual

Testing

Conventional

- CBC, INR, PTT, Bleeding time

Thromboelastography

Use of Thromboelastography and Rotational Thromboelastometry in Otolaryngology: A Narrative Review

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^{٤٣}
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TEG Explained
Thromboelastography

Basics of TEG
★ Measure of entire life cycle of a clot.
(45-60min for results)

Normal

KC

R-time (Reaction)
5-10min
- Clotting Factors/Anticoagulants
Treat: Rev. anticoagulant⁺

ICU
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