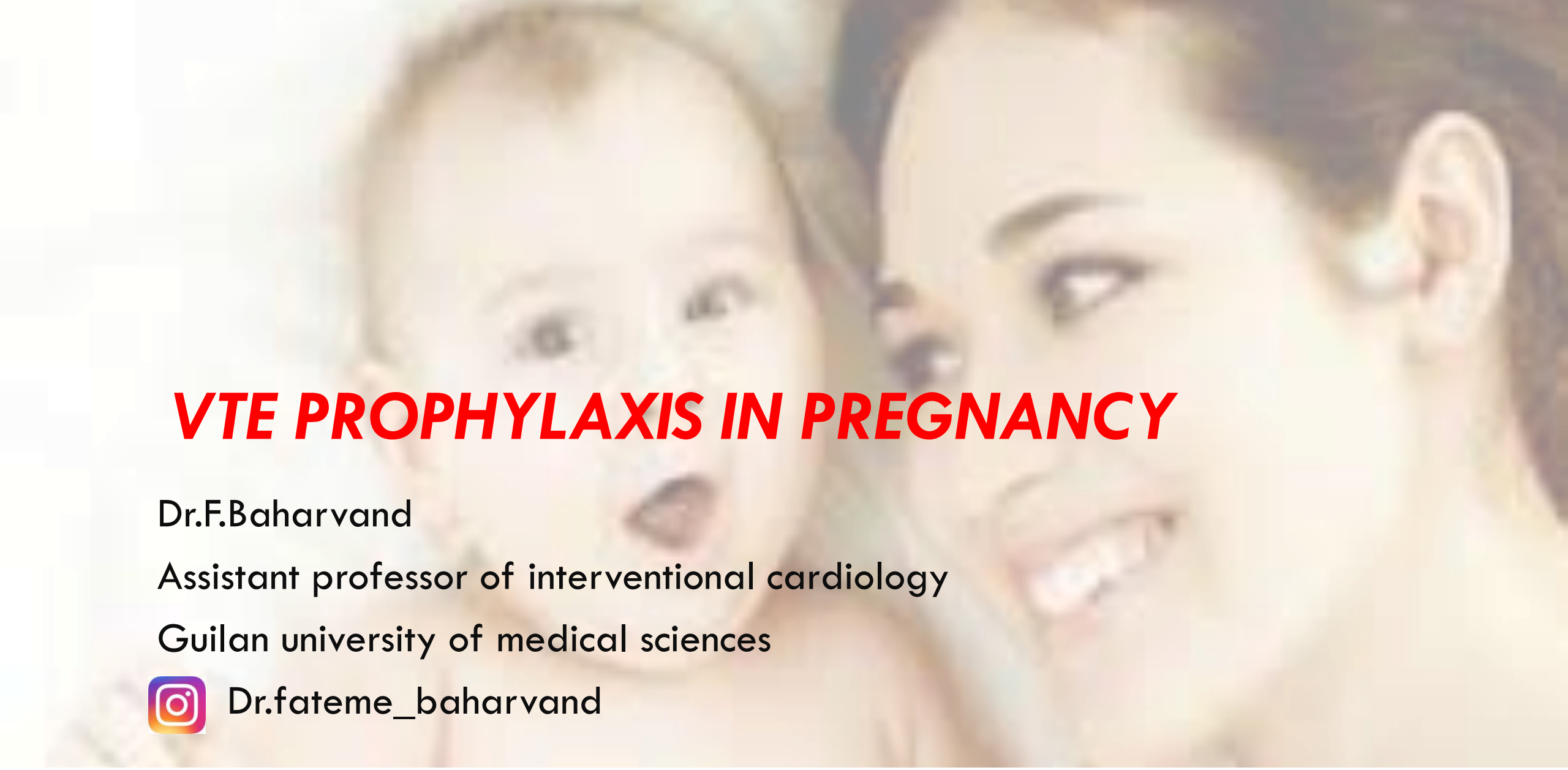

VTE PROPHYLAXIS IN PREGNANCY

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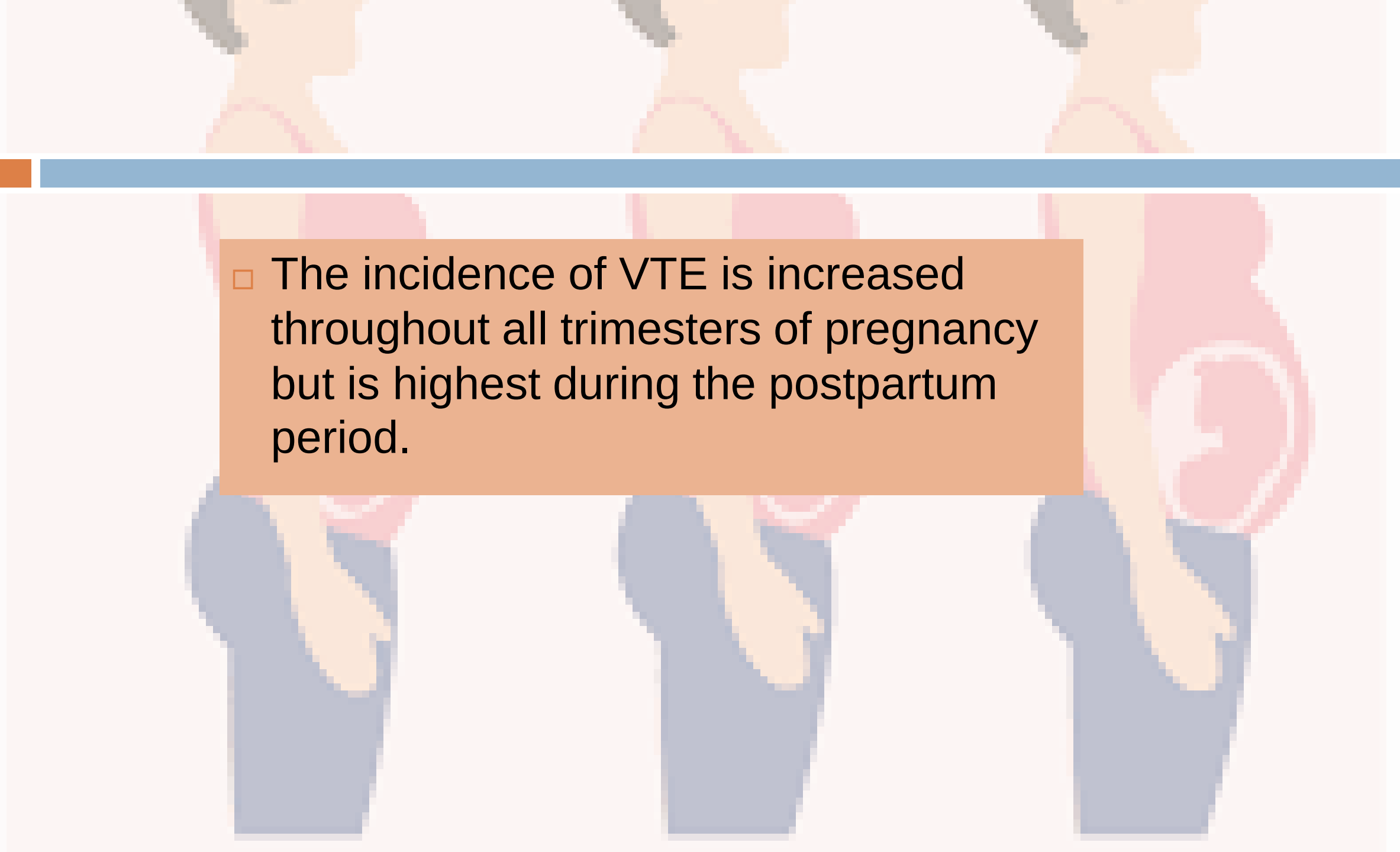
Case Vignette

- 32 Y/O lady
- PMH: unremarkable except
  - Left lower extremity proximal DVT 2 years ago following car accident & leg cast for which she received NOAC for 3 months

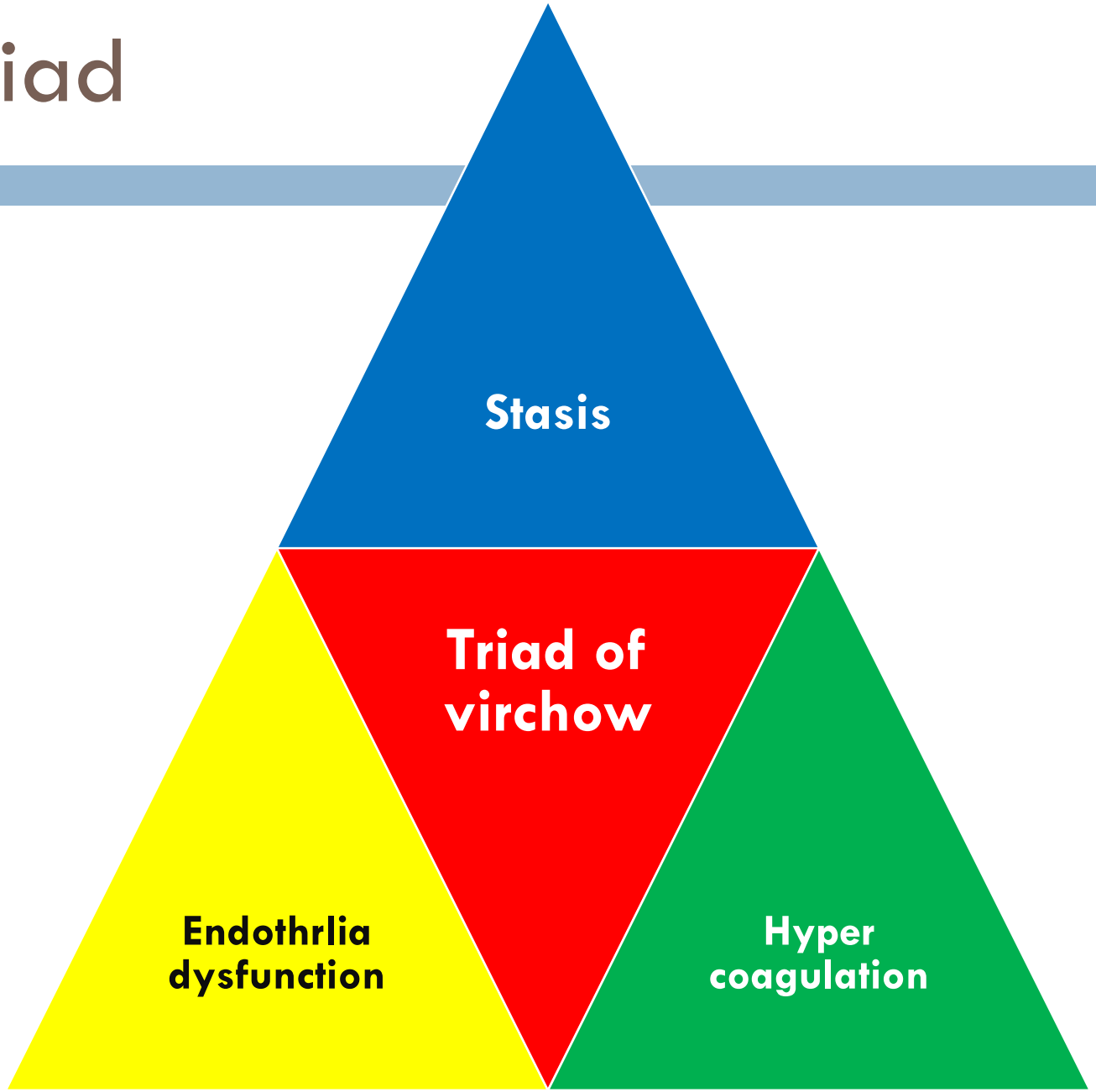
  Symptom free, came for preconception counseling
- DH:
  - Aspirin, 80mg, daily (initiated for her after discontinuation of NOAC)

Pregnancy and the puerperium are well-established risk factors for DVT and PE.



- The incidence of VTE is increased throughout all trimesters of pregnancy but is highest during the postpartum period.

Virchow's triad



The need for thromboprophylaxis should be assessed

Antepartum

postpartum

inpatient setting

VTE risk in pregnancy

- Compared with nonpregnant women risk is:
  - more than 2-fold higher in the first and second trimesters,
  - 9-fold higher in the third trimester
  - 80-fold higher in the first 2 to 6 postpartum weeks.
    - Most patients with postpartum VTE:
      - Women with thrombophilia: 40% to 50%
      - those who undergo Cesarean section :19% to 64%.

Risk increases with gestational age, peaking during the first 2 postpartum weeks.

VTE Risk Factors in Pregnancy
Personal history of VTE
Thrombophilia
Age >35 yrs
Body mass index >30 kg/m^2
Immobility
Nulliparity
Multiple gestation
Gestational diabetes
Pre(eclampsia)
Cesarean section
Antepartum hemorrhage
Postpartum infection
Hypertension
Diabetes
Smoking
Sickle cell disease
Systemic lupus erythematosus

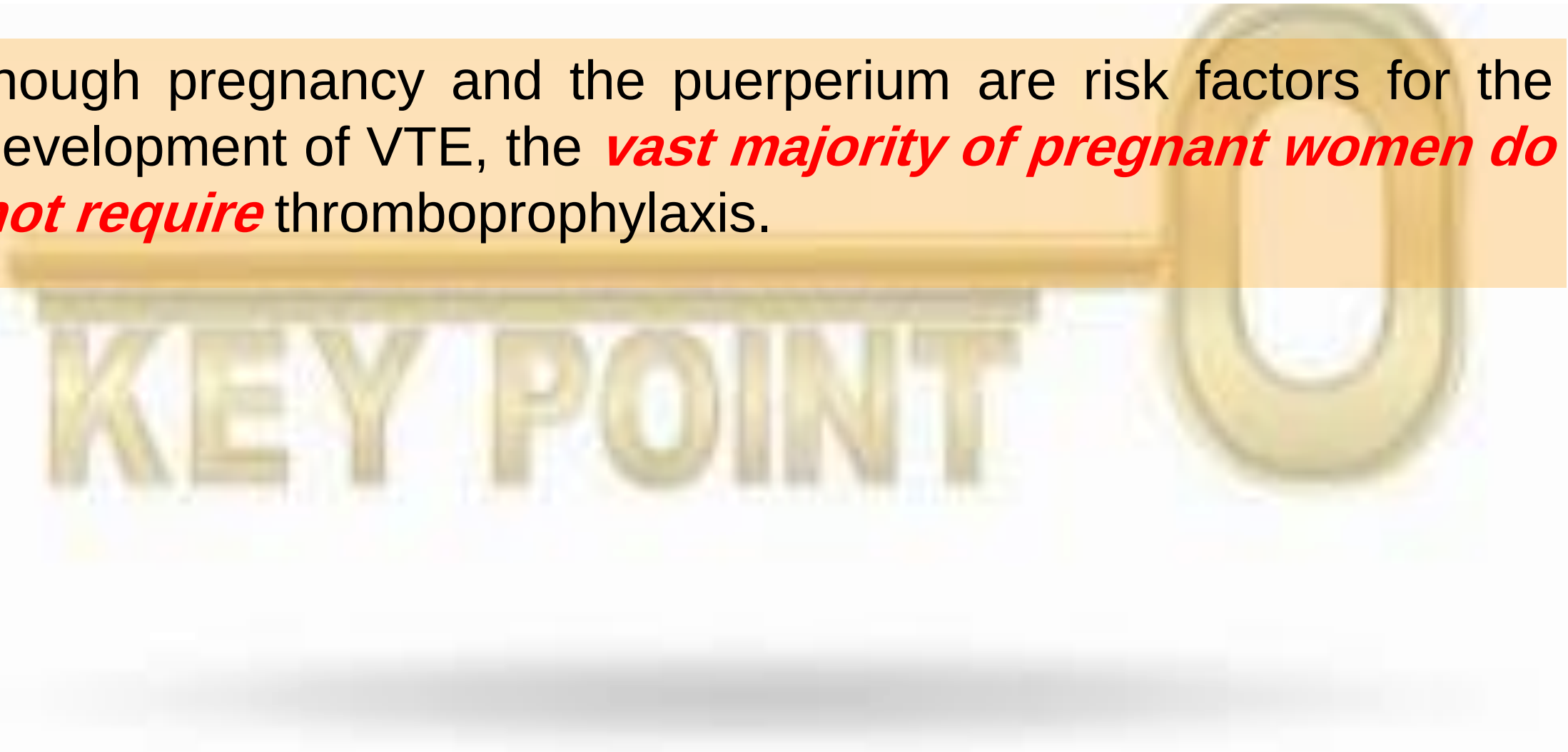
Factors that may further augment the risk:

prior history of VTE

hospitalization for an acute illness or cesarean delivery

an inherited thrombophilia

Although pregnancy and the puerperium are risk factors for the development of VTE, the ***vast majority of pregnant women do not require*** thromboprophylaxis.



CHEST Supplement
ANTITHROMBOTIC THERAPY AND PREVENTION OF THROMBOSIS, 9TH ED: ACCP GUIDELINES

VTE, Thrombophilia, Antithrombotic Therapy, and Pregnancy

Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

Shannon M. Bates, MDCM; Ian A. Greer, MD, FCCP; Saskia Middeldorp, MD, PhD; David L. Veenstra, PharmD, PhD; Anne-Marie Prabulos, MD; and Per Olav Vandvik, MD, PhD

CLINICAL GUIDELINES
blood advances

American Society of Hematology 2018 guidelines for management of venous thromboembolism: venous thromboembolism in the context of pregnancy

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The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

PRACTICE BULLETIN

CLINICAL MANAGEMENT GUIDELINES FOR OBSTETRICIAN–GYNECOLOGISTS

NUMBER 138, SEPTEMBER 2013 *(Replaces Practice Bulletin Number 124, September 2011)*

Inherited Thrombophilias in Pregnancy

Inherited thrombophilias are associated with an increased risk of venous thromboembolism and also have been linked to adverse outcomes in pregnancy. However, there is limited evidence to guide screening for and management of these conditions in pregnancy. The purpose of this document is to review common thrombophilias and their association with maternal venous thromboembolism risk and adverse pregnancy outcomes, indications for screening to detect these conditions, and management options in pregnancy.

Outpatient thromboprophylaxis

All antepartum women should be subjected to vigilant clinical surveillance throughout pregnancy for the signs and symptoms of VTE.

Pharmacologic prophylaxis may be considered in:

history of a single idiopathic VTE

pregnancy-associated or estrogen-associated VTE

in those with a history of multiple VTEs, regardless of the cause.

patients with a known thrombophilia

persistent risk factors and a prior history of VTE.

for those women in whom a transient risk factor for prior VTE (eg, trauma, immobility, surgery) is identified, the likelihood of recurrence is presumed to be lower.

Thus, clinical surveillance is preferred over pharmacologic thromboprophylaxis for those without persistent risk factors, unless multiple VTEs have occurred

دستور عمل پیشگیری از ترومبوآمبولی وریدی (VTE)

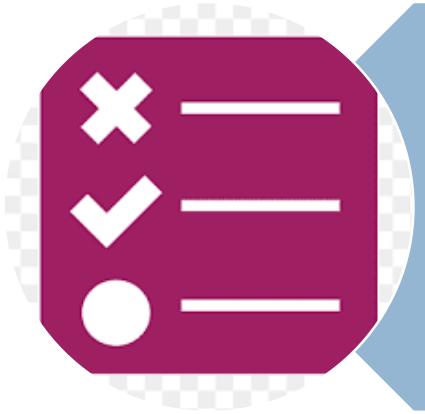
در بارداری و پس از زایمان

« برای اجرا در سطوح تخصصی و بیمارستانی »

ویرایش دوم : فروردین ۱۳۹۵

دفتر سلامت جمعیت، خانواده و مدارس

اداره سلامت مادران



Women who are already on anticoagulant **reassessed at the beginning of the pregnancy.**

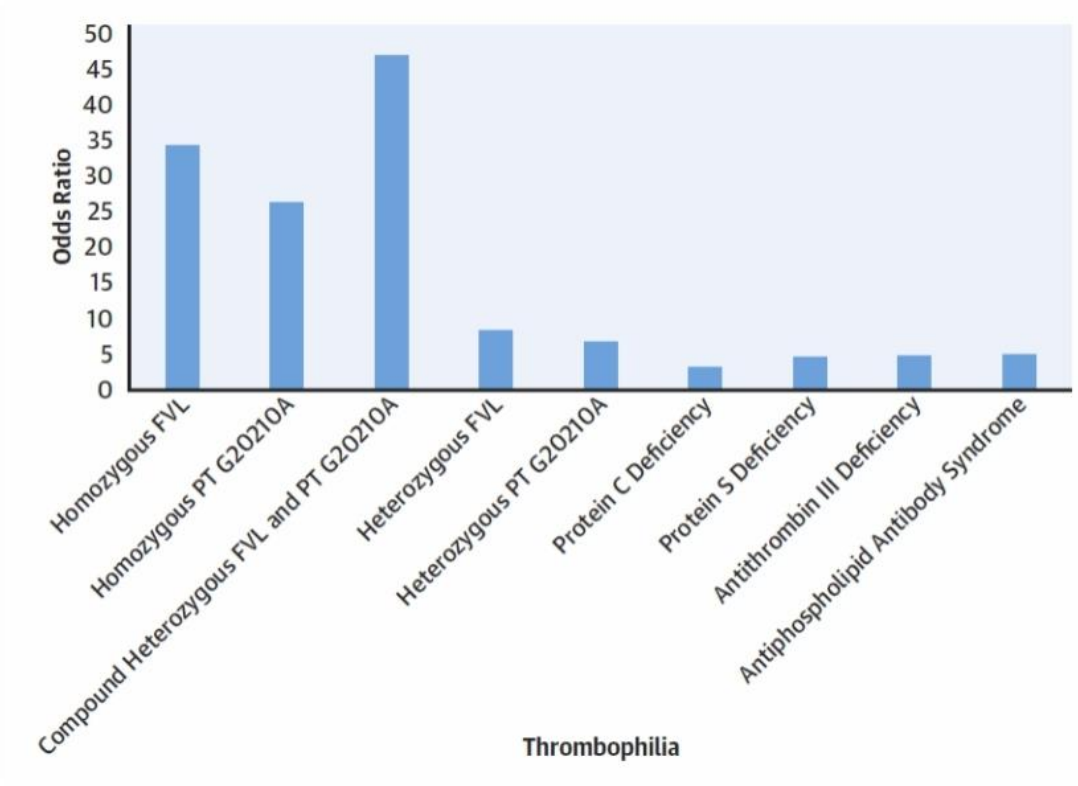
women who are receiving oral anticoagulation (NOAC or warfarin) should have their anticoagulant regimen **converted to a heparin-based regimen**.

Antepartum prophylaxis: benefits those at higher risk of VTE.

- There is a very low certainty in evidence for a net health benefit from using antepartum prophylaxis for the prevention of VTE in women with inherited thrombophilias.

VTE Risk by Thrombophilia in Pregnancy

- Compared with other pregnant women, women with an inherited thrombophilia have a 15 -fold higher risk for a pregnancy-associated VTE



Testing pregnant with a history of VTE

- Given the potential implications of thrombophilia guidelines support consideration of testing all , pregnant women with a history of VTE for
  - antiphospholipid antibody syndrome
  - Factor V Leiden (FVL) and prothrombin G20210A gene variant (PT G20210A)
  - antithrombin III, protein C, and protein S deficiencies

Postpartum —

All postpartum women should be subjected to vigilant clinical surveillance for the signs and symptoms of VTE.

Pharmacologic prophylaxis may be considered in:

history of prior VTE (single or multiple) regardless of the provoking factor (transient or persistent, inherited thrombophilia)

patients with inherited thrombophilia without a personal or family history of VTE.

- **the threshold for anticoagulation is lowered in the postpartum setting** largely because the risk of VTE is increased, and the potential for the more serious adverse effects of anticoagulation, including placental hemorrhage, spinal hematoma and fetal hemorrhage, is no longer a consideration.

Inpatient thromboprophylaxis

- There are insufficient data to support the ~~routine use of thromboprophylaxis for every woman hospitalized during pregnancy or postpartum.~~

Select women who do not meet the criteria for outpatient thromboprophylaxis may benefit from thromboprophylaxis during an acute hospitalization

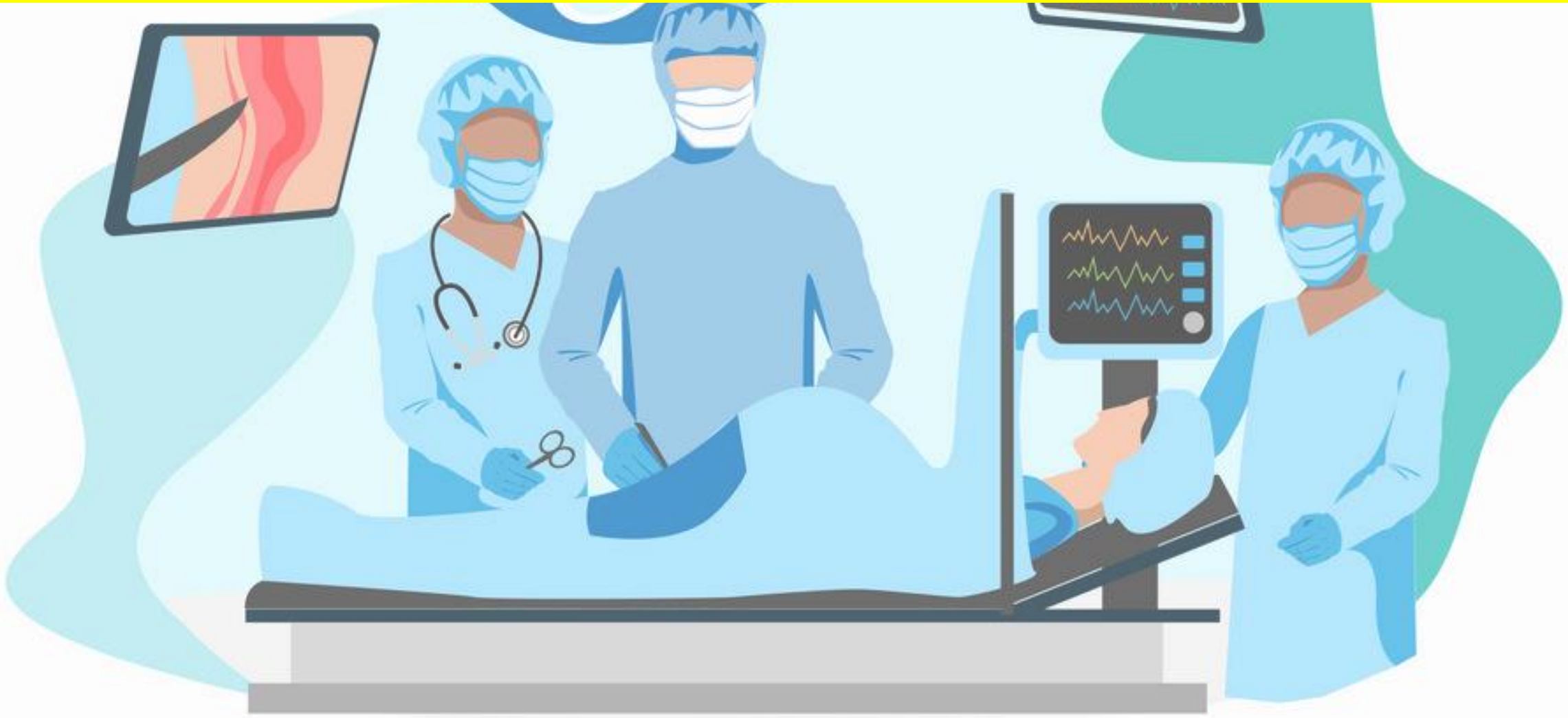
- .

Examples include

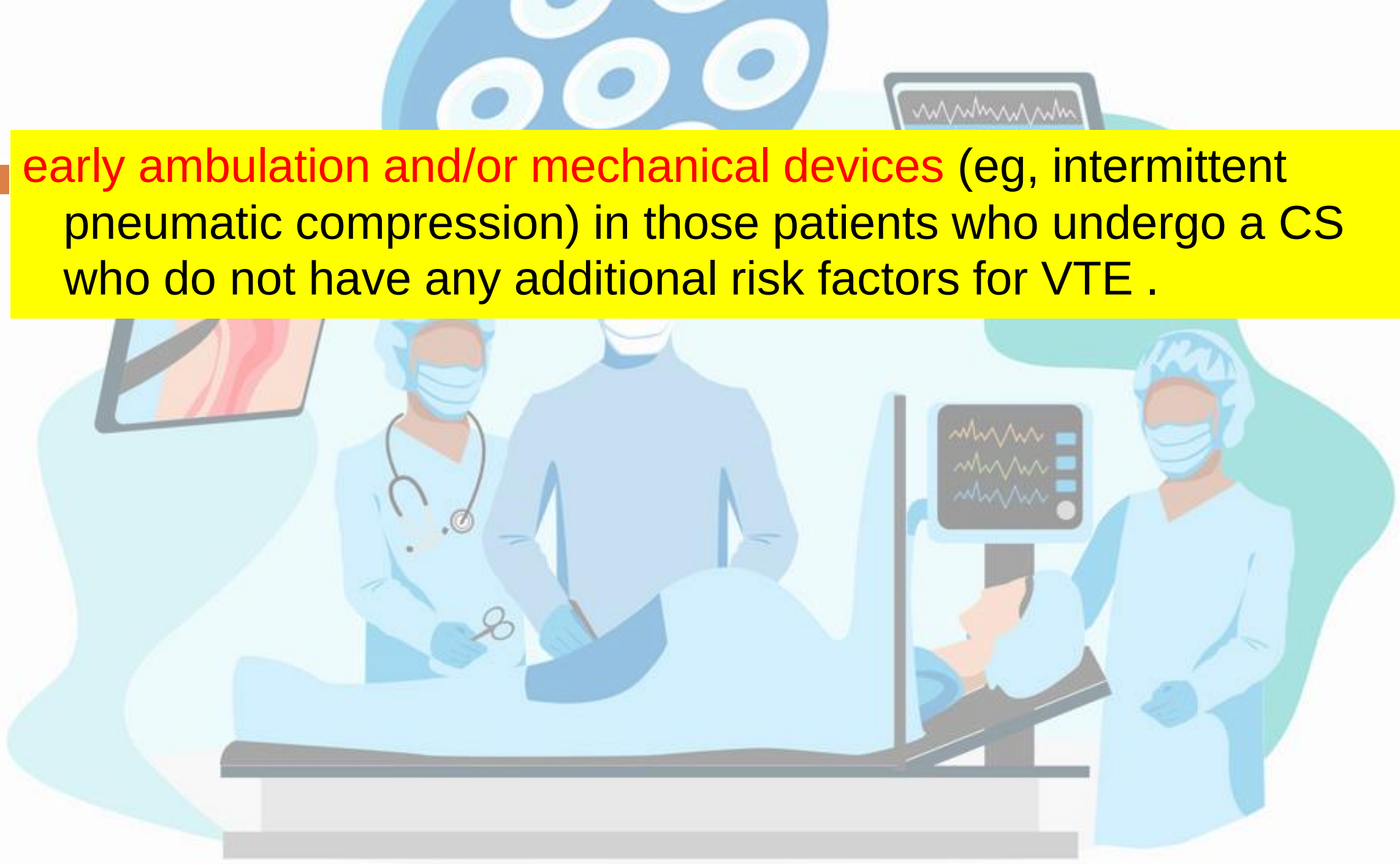
- those admitted for medical or surgical reasons (eg, pneumonia, sepsis, orthopedic injury)
- patients on prolonged bedrest (>3 days)
- those with additional or multiple accepted risk factors for VTE during pregnancy (eg, obesity, older maternal age, critical illness, malignancy, ovarian hyperstimulation, multiparity)

- The highest rates were observed in those pregnant with a body mass index (BMI) >30 kg/m^2, maternal age >35 years, an admission during the third trimester, and a hospital stay >3 days.

Cesarean section (CS) is associated with an increased risk of VTE, especially when performed emergently.



early ambulation and/or mechanical devices (eg, intermittent pneumatic compression) in those patients who undergo a CS who do not have any additional risk factors for VTE .



Pharmacologic prophylaxis

Heparins are used for most pregnant women because they do not cross the placenta and do not anticoagulate the fetus.

Low molecular weight heparin (LMWH)-based regimens are generally preferred.

- Unfractionated heparin is preferred over LMWH in patients with severe renal insufficiency (eg, creatinine clearance <30 mL/min), because *LMWH metabolism is exclusively renal, while metabolism of unfractionated heparin is renal and hepatic*

Which dose:

- Heparins can be administered during pregnancy at different doses depending upon the risk of thromboembolism and desired degree of anticoagulation

- Prophylactic dose anticoagulation refers to the use of low doses of anticoagulants (eg, enoxaparin 40 mg subcutaneously once daily), which aims to reduce the risk of thromboembolism while minimizing bleeding complications

- Intermediate dose anticoagulation refers to the adjustment of prophylactic dose anticoagulation with weight gain during pregnancy. (enoxaparin 40 mg twice daily as recommended by the American College of Physicians and American College of Gynecologists , some experts use an alternate dose of enoxaparin at 1mg/kg).

Nomencalcture

Therapeutic dose anticoagulation refers to the use of anticoagulants at doses typically reserved for treatment of thromboembolic disease (eg, enoxaparin 1 mg/kg subcutaneously twice daily).

Despite the nomenclature, therapeutic dosing may be used prophylactically (ie, to prevent thromboembolism).

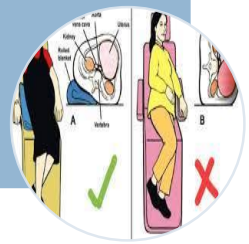
Unfractionated heparin	Prophylactic	5000 units SC every 12 hours
	Intermediate¶	First trimester: 5000 to 7500 units SC every 12 hours
		Second trimester: 7500 to 10,000 units SC every 12 hours
		Third trimester: 10,000 units SC every 12 hours
	Therapeutic	Can be given as a continuous IV infusion or an SC dose every 12 hours. Titrated to keep the aPTT in the therapeutic range.

When LMWH is administered for venous thromboembolism (VTE) prophylaxis in a patient without a thrombophilia, prophylactic or intermediate doses are used.

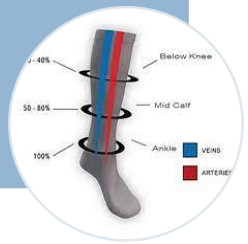
Therapeutic dosing is used when prophylactic or intermediate dosing is thought to be insufficient for thromboembolism prophylaxis in some patients at very high risk of thromboembolism

Mechanical prophylaxis

- frequent left-lateral decubitus positioning during late pregnancy



- graduated elastic compression stockings



- pneumatic compression devices

Mechanical prophylaxis

The efficacy **is unknown** because there is a paucity of evidence.

Nonetheless, the use of mechanical prophylaxis following cesarean section and for hospitalized women during pregnancy is considered safe

- When thromboprophylaxis is administered during hospitalization (eg, acute illness or cesarean section), it should continue until the patient is ambulatory.

- Extended prophylaxis (ie, after discharge) is considered by some physicians to be beneficial in select circumstances (eg, patient with a cesarean section who is assessed to be at very high risk or who has multiple persistent additional risk factors for VTE)

COMPLICATIONS

Heparin has several side effects, including bleeding, thrombocytopenia, with or without associated thrombosis, and osteoporosis.

These adverse effects can occur even at prophylactic doses and are more likely with long-term use.

SUMMARY

- The risk of venous thromboembolism (VTE) is increased in all trimesters of pregnancy, especially the postpartum period. Although most women do not require thromboprophylaxis, those who are considered to be at greatest risk are generally targeted for VTE prevention

Case Vignette

- 32 Y/O lady
- PMH: unremarkable except
  - Left lower extremity proximal DVT 2 years ago following car accident & leg cast for which she received NOAC for 3 months

  Symptom free, came for preconception counseling
- DH:
  - Aspirin, 80mg, daily
    (initiated for her after discontinuation of NOAC)

Should **postpartum** anticoagulant prophylaxis be used for pregnant women with **prior VTE**?

- Benefits. Postpartum VTE affects 6.5% of pregnancies in women with a history of VTE (95% CI, 4.3%-9.7%), compared with a risk of approximately 0.6 of every 1000 deliveries in the general population.
- In women with a history of VTE who were treated with postpartum prophylaxis (LMWH, UFH, or warfarin), the risk of postpartum VTE was substantially lower at 1.8% (95% CI, 1.2%-2.7%), representing a decrement in risk similar to that seen with extended LMWH prophylaxis after high-risk orthopedic procedures
- Harms and burden. The risks of major peripartum and postpartum bleeding with LMWH prophylaxis were similar to the risks in those not receiving prophylaxis (10 [2.5%] of 404 and 12 [3.0%] of 395, respectively, for major peripartum hemorrhage [RR, 0.82; 95% CI, 0.36-1.86; 5 fewer per 1000, from 19 fewer to 26 more]59 and 2 [0.3%] of 767 and 0 [0.0%] of 108, respectively for postpartum prophylaxis)

Recommendation 18

For women not already receiving long-term anticoagulant therapy who have a history of VTE, the ASH guideline panel *recommends* postpartum anticoagulant prophylaxis (strong recommendation, low certainty in evidence about effects ⊕⊕◯◯).