



Coagulopathy: A Multidisciplinary Concern, Documentation Challenge, and Coding Complexity

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Presented By



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Learning Objectives

- At the completion of this educational activity, the learner will be able to:
 - Name two types of coagulopathy
 - Define coagulation cascade and its implication for identifying coagulopathy clinical indicators
 - Describe how clinicians leverage laboratory test results in diagnosis of coagulopathy and how to use results in forming compliant queries
 - Identify proper coding and compliant query composition related to coagulopathy

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Coagulopathy Definition

- Any derangement of hemostasis resulting in either excessive bleeding or clotting
- Most typically defined as impaired clot formation



Vanderwerf JD, et al. "Management of neurologic complications of coagulopathies," *Handbook of Clinical Neurology*. 2017(141):743-64.

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Types of Coagulopathy

Acquired Coagulopathy

Examples:

- Anticoagulant use
- Antithrombotic therapy
- Disseminated intravascular coagulation (DIC)
- Liver disease

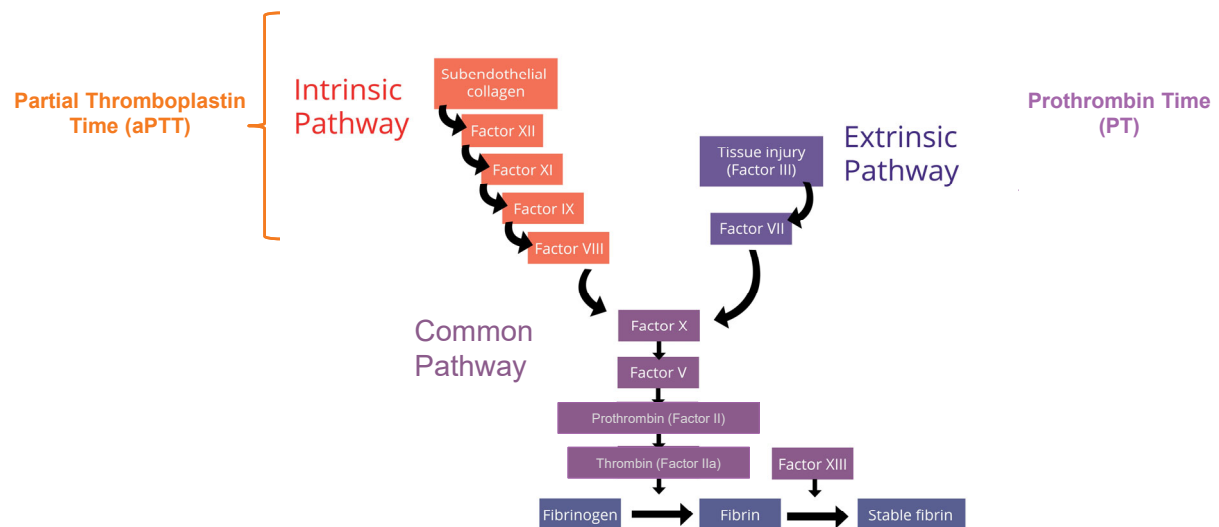
Inherited Coagulopathy

Examples:

- Hemophilia
- Von Willebrand disease
- Factor XI deficiency
- Fibrinogen disorders
- Thrombophilia:
 - Protein C deficiency
 - Protein S deficiency
 - Antithrombin III deficiency

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Coagulation Cascade



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An Approach to Chart Review: Coagulopathy

- Labs
- History
- Key Words

Lab Review

- Abnormal labs may point out potential coagulopathy
- Lab values may be used to rule in/rule out potential additional coagulation diagnoses identified on review
- Common values which may be abnormal:
 - PT, aPTT, INR
 - Platelet count, platelet function test (PFA-100)
 - Bleeding time
 - Focused analysis – Factors
 - D-Dimer
- Wells' Criteria vs PERC Rule
 - Stratify risk of clotting and the need for workup



Zehnder JL, et al. "Clinical use of coagulation tests." *UptoDate*. Accessed January 9, 2022

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Focused Laboratory Analysis

Fibrinogen

Plasminogen Activator Inhibitor

Antithrombin Levels

Protein C or Protein S

Factor Deficiency Analysis

- Factor II
- Factor V
- Factor VII
- Factor VIII deficiency: Hemophilia A
- Factor IX deficiency: Hemophilia B (Christmas Disease)
- Von Willebrand Factor deficiency: Von Willebrand Disease (VWD)
- Factor X
- Factor XI
- Factor XIII

Zehnder JL, et al. "Clinical use of coagulation tests." *UptoDate*. Accessed January 9, 2022

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Interference With Lab Results

Inaccurate results may occur in some circumstances:

- Contaminated draw
- Incomplete filling of collection tubes
- Slow blood flow during draw
- Intentional medication use

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History

- Often an incidental finding, identified during surgery or a traumatic injury
- Some patients report "easy bleeder," "excessive bleeder," or "thin blood"
- Family history and social history
- Bruising, petechiae, hematomas
- Nose bleeds
- Heavy menstrual bleeding
- Recent changes in homeostasis of the body (e.g., pregnancy, lifestyle change, etc.)
- Anticoagulation, antithrombotic, or antiplatelet medication use

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Prolonged PT (INR)

- Vitamin K antagonists (ie, warfarin)
- Anticoagulants
- Vitamin K deficiency
- Liver disease
- Disseminated intravascular coagulation (DIC)
- Antiphospholipid antibodies



Prolonged PTT (aPTT)

- Heparin
- Direct thrombin inhibitors and direct factor Xa inhibitors
- Anticoagulants
- Liver disease
- DIC
- Von Willebrand disease
- Hemophilia A or B
- Other inherited factor deficiencies
- Factor inhibitors
- Lupus anticoagulant-type inhibitors
- Certain medications

Zehnder JL, et al. "Clinical use of coagulation tests." *UptoDate*. Accessed January 9, 2022

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Hypercoagulable State

Specific Etiology:

- Inherited
 - Factor V or Prothrombin G20210A mutation
 - Antithrombin deficiency
 - Protein C deficiency or Protein S deficiency
- Acquired
 - Predispose individuals to developing venous thromboembolisms (VTE)
 - Example: Antiphospholipid antibody

Risk Factors:

- Thrombophilia
- Obesity
- Dehydration
- Hormonal shifts such as pregnancy or menopause
- Lack of activity
- Malignancy
- Recent surgery
- Infection (e.g., COVID-19)

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Discipline-Specific Coagulopathy Considerations

- Gastrointestinal medicine
- Bariatric surgery
- Trauma and infectious disease
- Poisoning/adverse affect of substances or medication
- Hematology
- Oncology

Gastrointestinal Medicine

Liver Disease

- Patients with acute and chronic liver disease
- Liver produces clotting factors
- INR test may be elevated
- Thromboelastogram may be charted

Bariatric Surgery

- Thrombophilia
- Testing is available for certain high-risk populations, to determine thrombophilia in asymptomatic patients
- Many bariatric surgeons will get a Factor VIII level as part of pre-op evaluation
- 30 days of prophylactic anticoagulation after surgery is relatively common



Zehnder JL, et al. "Clinical use of coagulation tests." *UptoDate*. Accessed January 9, 2022

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Trauma/Infectious Disease Disseminated Intravascular Coagulation (DIC)

- A.K.A. Consumption Coagulopathy or Defibrination Syndrome
- Diagnosis:
 - Thrombocytopenia
 - Elevated partial thromboplastin time and prothrombin time
 - Increased Plasma D-Dimers
 - Decreased Plasma Fibrinogen levels
- Treatment:
 - Platelets and/or Fresh Frozen Plasma (FFP)
 - Treat the underlying cause
 - Supportive care

Moake, JL. Disseminated Intravascular Coagulation (DIC), Merck Manual Online, Sep 2021.

Kutcher ME, et al. Coagulopathy in trauma patients. In TW Post, P Rutgeerts, & S Grover (Eds). *UptoDate*. Accessed January 9, 2022

Leung L LK, et al. Coagulopathy in trauma patients. In TW Post, P Rutgeerts, & S Grover (Eds). *UptoDate*. Accessed January 9, 2022

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Poisoning or Adverse Effect of Medication Associated with Coagulation Disorders



Anticoagulant	Antithrombotic
<p>Interfere with normal clotting factors:</p> <ul style="list-style-type: none"> • Prothrombin • Thrombin • Factor X <p>Examples:</p> <ul style="list-style-type: none"> • Coumadin, Heparin, Lovenox • Factor Xa inhibitors (eg, Eliquis, Xarelto) • Direct thrombin inhibitors (eg, Pradaxa, Angiomax, Argatroban, Iprivask, Refludan) 	<p>Prevent thrombus formation</p> <p>Examples:</p> <ul style="list-style-type: none"> • Aspirin (ASA) • Plavix • Ticlid • Integrelin • Aggrastat • ReoPro

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Poisoning or Adverse Effect of Substances Associated with Coagulation Disorders

Drug class or substance	Mechanism
Anticoagulants	Interfere with clot formation (secondary hemostasis)
Antiplatelet agents, including NSAIDs	Interfere with platelet function (primary hemostasis)
Glucocorticoids	Interfere with vascular integrity
Antibiotics	Cause vitamin K deficiency, especially with longer use Some interfere with platelet function
SSRIs	Interfere with platelet function (primary hemostasis)
Alcohol	Complications of liver disease may affect clot formation and may cause thrombocytopenia May cause thrombocytopenia due to direct marrow toxicity
Vitamin E	Interferes with vitamin K metabolism in some individuals
Garlic	Interferes with platelet function in some individuals
Ginkgo biloba	Unknown

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Multidisciplinary Case Studies

- Thrombophilia in Bariatric Surgery
- Recurrent Embolism in Hematology/Oncology
- Inherited Mutation in Genetics
- Hemorrhage in Trauma
- Disseminated Intravascular Coagulation (DIC) in Infectious Disease

Case 1: Thrombophilia

42 yo male with a BMI of 44 presents for elective laparoscopic sleeve gastrectomy.
Discharged home without complication

Hospital Course

- Patient readmitted 10 days s/p surgery with severe abdominal pain and chest pain with dyspnea. Vitals: Tm 101.5, HR 120, RR 28
- CT scan shows occlusive thrombus of the superior mesenteric vein and air-fluid levels within the abdomen, notable small bowel wall edema with intramural gas
- Patient was taken to the OR. Over 100cm of infarcted bowel was noted in 2 locations with viable tissue between them. Necrotic bowel was resected and two stomas created
- Full work up for hypercoagulable state showed significantly elevated Factor VIII
- Patient was D/C on TPN and heparin

Risk Factors:
Morbidity Obesity
Recent surgery

Discharge Diagnoses

Superior Mesenteric Vein Thrombus
S/P LSG
Infarcted Bowel **with necrotic bowel**
Thrombophilia

	Documented	Suggested
DRG	395	394
RW	0.6515	0.9409
Severity of Illness	1	2
Risk of Mortality	3	3
Actual LOS	3	3
ALOS	2.6	3.8

Case 2: Recurrent VTE

31 yo female with known history of multiple venous thromboembolism during and after chemotherapy on chronic oral anticoagulation therapy with Xarelto, presented with a large induration of the right jaw as well as erythema and pain over the right anterolateral area of her mandible

Hospital Course

- Patient has a history of lung cancer and was receiving chemotherapy when her first VTE occurred. She states she has a new thrombus within weeks of coming off anticoagulation

Labs on admission	
PT	15.8
INR	1.27

**Note: Hypercoagulable State
Indexes to Primary
Thrombophilia when coded**

- H/P PMH: Recurrent VTEs due to hypercoagulable disorder. Pulmonary embolism, right LE DVTs. Sepsis criteria not met
- OMFS Consult: Assessment: Cellulitis of mandible. Currently on Xarelto.
- Plan: no surgery indicated, will monitor, agree with antibiotics

Discharge Diagnoses

Cellulitis of mandible
Hypercoagulable disorder (active and chronic)
Long term use of anticoagulation med

	Documented	Suggested
APR	383.1	383.2
RW	0.4241	0.5619
Severity of Illness	1	2
Risk of Mortality	1	1
Actual LOS	3	3
ALOS	2.77	3.78

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Case 3: Inherited Genetic Mutation

68 yo male with PMHx of CAD, HLD, HTN, DM, Factor V Leiden mutation, no history of clots and CABG, presented with palpitations and malaise. She was admitted with a COVID

Hospital Course

- H/P: Patient has been on Xarelto and aspirin for prophylactic treatment of hypercoagulation
- Family History: Father has Factor V Leiden mutation, multiple blood clots in the past, and is on blood thinners. All siblings have prophylactic anticoagulation.

Labs on admission	
PT	15.3
INR	1.22
PTT	38.4

- Treatment: Xarelto, ASA, lab monitoring, no oxygen requirements, remdesivir given

Discharge Diagnoses

COVID-19
Sinus tachycardia with PVCs
Factor V Leiden inherited hypercoagulopathy
Chronic use of anticoagulation medication

	Documented	Suggested
DRG	179	178
RW	0.8727	1.2078
Severity of Illness	3	3
Risk of Mortality	2	2
Actual LOS	3	3
ALOS	3.7	5.0

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Case 4: Traumatic Uterine Rupture

68 yo male with PMHx of CAD, HLD, HTN, DM, Factor V Leiden mutation, no history of clots and CABG, presented with palpitations and malaise. She was admitted with a COVID

Hospital Course

- H/P: Patient has been on Xarelto and aspirin for prophylactic treatment of hypercoagulation
- Family History: Father has Factor V Leiden mutation, multiple blood clots in the past, and is on blood thinners. All siblings have prophylactic anticoagulation.

Labs on admission	
PT	15.3
INR	1.22
PTT	38.4

- Treatment: Xarelto, ASA, lab monitoring, no oxygen requirements, remdesivir given

Discharge Diagnoses

COVID-19
Sinus tachycardia with PVCs
Factor V Leiden inherited hypercoagulopathy
Chronic use of anticoagulation medication

	Documented	Suggested
DRG	179	178
RW	0.8727	1.2078
Severity of Illness	3	3
Risk of Mortality	2	2
Actual LOS	3	3
ALOS	3.7	5.0

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Case 5: DIC

81 yo female presents from a nursing facility with SOB, recent confusion, and a history of HTN and dementia

Hospital Course

- ER Note: Tmax 101.2, HR 102, RR 22, BP 80/50; CXR – LLL Pneumonia
- Diagnosis: Acute Resp Distress, Sepsis, Pneumonia. Plan: IV antibiotics, Levophed to maintain MAP
- CCU Note Day 2: SOB progressive, RR 28 now with O2 sats of 88% on RA, struggling with sputum. Patient was intubated
- CCU Note Day 2pm: Hematuria noted, petechia, blood-tinged secretions. # DIC secondary to sepsis. Urine output for 12h was 175cc. Fingers/Toes were cold/pale, tips turning purple. FFP given
- CCU Note Day 3: FIO2 of 60% to maintain sats in low 90s. Still on pressors. Sputum nearly all blood. IV site oozing blood. Bruising and petechia on all ext. Toes purple. RBCs/FFP given
- Day 4: Toes are necrotic, severe hematuria and hemoptysis. Family decided to make DNR, patient passed

	Day 1	Day 2	Day3
BP	90/60	90/50	80/40
Temp	101.2	101.7	100.0
WBC	15		
Creatinine	1.4	3.2	3.8
Lactate	3.5		4
D-Dimer		▲	>500
PT & PTT		▲&▲	▲&▲
Platelets		75,000	80,000
Fibrinogen			88

Discharge Diagnoses

Acute respiratory distress 2/2 pneumonia
~~Sepsis 2/2 Pneumonia~~
Severe sepsis with shock 2/2 Acute Respiratory Failure with Pneumonia
DIC
AKI due to sepsis and DIC

	Documented	Suggested
DRG	871	871
RW	1.8722	1.8722
Severity of Illness	2	4
Risk of Mortality	1	4
Actual LOS	5	5
ALOS	6.2	6.2

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Chart Review: Coagulopathy



Atrial Fib
Acute Coronary Syndrome

FFP

Thrombocytopenia
Low Platelets

Wells' Criteria
PERC Rule

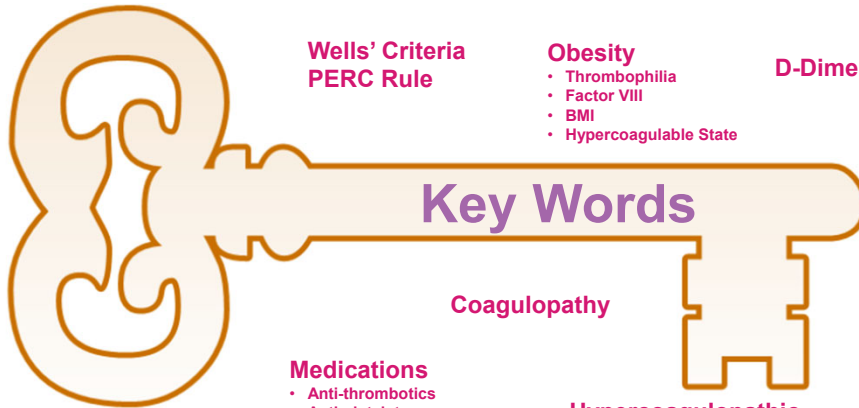
Obesity
• Thrombophilia
• Factor VIII
• BMI
• Hypercoagulable State

D-Dimer

PT, PTT, INR

Cancer

Liver Disease



Key Words

Coagulopathy

Hypercoagulopathic
Disorder

Anti-phospholipid
Syndrome

Medications

- Anti-thrombotics
- Anti-platelets
- Anti-coagulants
- Vitamin K

History

- Genetic
- Inherited
- Bleeder/bleeding
- VTE or PE
- Stroke
- Thrombus, embolism, clot
- Nosebleed
- Pregnancy
- Recent surgery/inactivity

Remember: Documentation of "probable, likely, or possible" and "cannot rule out" are all codable if carried through the D/C summary

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Coding and Query Writing Considerations

- Hemorrhagic admission
- Poisoning
- Adverse effect
- Abnormal labs

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- Example: Epistaxis due to accidental overdose of coumadin

Query Writing Suggestions - Coagulopathy

Query Tips

- Abnormal lab values need physician documentation on significance/relevance
- If adding a secondary diagnosis, make sure to give more than one choice
- Include open ended options

Supporting Lab Evidence

- Include all pertinent coagulation labs
- Do not forget about the specialty labs
- Examples:
 - ✓ Factor assay
 - ✓ Plasminogen activator
 - ✓ Protein C/S
 - ✓ Fibrinogen etc)

Historical Support

- Include any historical labs/findings and any historical diagnosis
- Example:
 - ✓ Factor VIII level >150% on pre-operative visit
 - ✓ PreOp note for bariatric surgery: Diagnosis – Thrombophilia, morbid obesity with BMI of 42

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Query Formulation

Risk Factors: 91 y/o M with PMHx significant for chronic atrial fibrillation on Coumadin and recent diagnosis of bladder cancer admitted for hematuria.

- Urology and cardiology were consulted. Urology initially maintained the patient on CBI, but he quickly resolved his hematuria once his Coumadin and aspirin were stopped, so the CBI was clamped.
- Patient improved and was discharged with outpatient Urology follow-up

Clinical Findings

- H/P: Discharged 6w ago off Coumadin which was **recently resumed by his cardiologist**...
 - passed a large blood clot when urinate...
 - Foley catheter was placed and he was noted to have clots in the urine.
 - He was started shortly on CBI with improvement in the urine color...
 - Suspect hematuria likely in the setting of bladder cancer and Coumadin use**
- Cardiology Consults: Risk of long-term AC given recurrent bleeding
- Discharge Summary: **Given recurrent hematuria, recommend indefinite hold on Coumadin** -Follow-up with urology as an outpt for bladder cancer
- Lab Findings

	Value 1	Value 2	Value 3
PT	29.3	27.6	27
INR	2.8	2.6	2.6

Is the principal diagnosis clear?
What can be clarified?
Is a query needed?

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Creating Query Answer Options

Please render your opinion as to the significance of the clinical indicators described below. Should you feel that the diagnosis suggested by the query is clinically supported, please add an addendum to your progress note or discharge summary.

- ☐ Hematuria related to Coumadin use
- ☐ Hematuria unrelated to Coumadin use
- ☐ Other (please specify): _____
- ☐ Unable to Determine (please comment): _____



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Query Example

Please further specify (if possible) the etiology of the documented "Pancytopenia" during admission. Should you feel that the diagnosis suggested by the query is clinically supported, please reply in response note default text box.

Considerations include (but not limited to):

- ☐ Pancytopenia possibly due to drugs
- ☐ Pancytopenia due to other (please specify)
- ☒ **Pancytopenia, unable to further specify etiology***
- ☐ Other explanation of clinical findings (please specify)
- ☐ Unable to Determine (please comment)

*Include an option with the diagnosis in question without the linking etiology

The medical record reflects the following:

- Progress Notes: A/P: Pancytopenia - WBC 3.3 (baseline > 4), RBC 2.78, Hb 9.2, Plt 123. Possible benign leukopenia vs. drug-induced leukopenia, no Neupogen required at this time
- Progress Notes: Pancytopenia most likely benign, no Neupogen for now, follow up with Hematology clinic upon discharge. MDS considered, BM biopsy offered by declined by son
- Discharge Summary: Hematology evaluated patient for persistent pancytopenia who stated Smear: Normochromia, no schistocytes, neutrophils with vacuoles, toxic granules. No immature cells and dysplastic feature...Benign leukopenia vs. drug induced leukopenia...pts pancytopenia gradually resolved during hospital course.
- Treatment: Hematology consult, Lab monitoring, F/U with hematology outpatient
- Risk Factors/PMH: 78F admitted for observation of hypoxic respiratory failure 2/2 mechanical obstruction of tracheostomy tube by mucous plug.

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To Query or Not To Query: That is the Question

45 yo male with epistaxis, taking coumadin is admitted to the hospital. History reveals he accidentally took too many coumadin pills over the last few days. He requires nasal packing and FFP, as his INR is 6.8. Coumadin is discontinued and CBC/INR monitored with slow reintroduction to Coumadin. What is the PDX?

- A. T45.515A (Adverse effect of anticoagulants, initial encounter)
- B. R04.0 (Epistaxis)
- C. T45.511A (Poisoning by anticoagulants [accidental],unintentional) ★

To Code Without A Query....



72 yo male with history of atrial fibrillation on chronic anticoagulant therapy is admitted to the hospital with chest pain. D68.69 (Acquired hypercoagulable state/Other thrombophilia) is commonly assigned or queried for in these cases.

Proper documentation to capture this code without a query:

A documented link between the secondary hypercoagulable state and the atrial fibrillation

An assessment which includes "acquired hypercoagulable state"

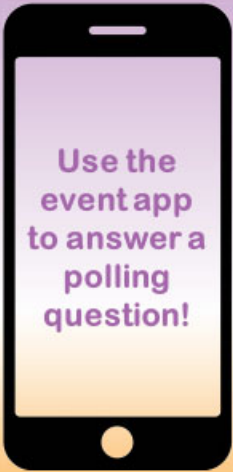
Remember: Atrial fibrillation in itself **IS NOT** a hypercoagulable state



Let's Test Your Knowledge



Steps for Attendees to Answer/View POLLING QUESTIONS



Use the
event app
to answer a
polling
question!

1. Navigate to the **Schedule** in the main menu.
2. Tap the **name of the current session** to view the session details page.
3. Scroll down the page to **Live Polls**.
4. Tap the **name of the poll**.
5. Tap your **answer** choice(s) and then tap **Submit**.

Polling Question 1

- Patient is taking coumadin and admitted for melena and GI bleed. Last endoscopy 2 months ago showed esophageal varices without bleeding. Repeat endoscopy on this admission now has bleeding. Coumadin initiated 1 month ago for DVT. INR is 3.1 (normal range is <1.1, therapeutic range when on Coumadin 2-3), **which of the following are appropriate next steps?**
 - A. Patient's INR is documented above therapeutic range, code as R79.1 (Abnormal coagulation profile)
 - B. Query for Code D68.32 (Hemorrhagic disorder due to extrinsic circulating anticoagulants)
 - C. Code D68.32 (Hemorrhagic disorder due to extrinsic circulating anticoagulants)
 - D. Answers A and B are correct
 - E. Answers A and C are correct

POLLING RESULTS Question 1

Polling Question 2

- 67 yo male is admitted with GI bleed, taking Plavix appropriately. Plavix is discontinued. EGD and colonoscopy show a bleeding gastric ulcer. Aside from assigning code K25.4 (gastric ulcer with bleeding), **should an additional code be queried?**
 - A. There is not enough documentation to support a query for an additional diagnosis
 - B. Consider a query for D68.32 (Hemorrhagic disorder due to circulating anticoagulants)
 - C. Consider a query for T45.525A (Adverse effect of antithrombotic)
 - D. Both B and C are correct

POLLING RESULTS Question 2

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Thank you. Questions?

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